

Emotion elicitation as a window on children's emotion regulation, empathy,  
and social adaptation

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## Abstract

The manner in which children manage their emotional arousal in response to challenging events is crucial for social adaptation and peer relationships (Eisenberg, Spinard, & Eggum, 2010; Saarni, 1999). However, while there is a large literature examining the relation between children's emotion regulation and their social competencies, there are several conceptual and methodological challenges facing the emotion regulation construct (Cole, Martin, & Dennis, 2004; Thompson, 1994). The studies presented in this thesis use structured emotion elicitation paradigms (emotionally challenging video vignettes) in order to interpret the meaning of children's behavioural responses to specific situational contexts, within the framework of emotion regulation. In addition, concurrent and longitudinal relations between young children's emotion regulation and their social adaptation are examined at the time of children's school entry. Finally, the close conceptual relation between emotion regulation, empathy, and emotion understanding is empirically examined, with an emphasis on the relation between these different measures of children's emotional competence and their independent and combined impact on social adaptation.

Across two separate studies, it was found that children's behavioural responses were systematically related to their eliciting contexts. In particular, the degree to which children *disengaged* from emotionally challenging content, and their expressions of *worry-concern* and empathic *sadness*, were highly contextually and temporally bound, showing a close correspondence with specific events in the emotion elicitation paradigms. However, despite the close association between children's behavioural responses and their eliciting contexts, such responses showed impressive individual stability across contexts, as well as across time. Furthermore, there was robust independence across different behavioural domains. The only exception to this pattern was between disengagement and children's emotional expressions; whereas children expressing higher levels of worry-concern were also observed to express higher levels of disengagement, children expressing empathic sadness expressed lower levels of disengagement. This finding broadly supports the

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proposal of Eisenberg and Fabes (1992) that well regulated children (i.e., low levels of disengagement) are more likely to be empathic (i.e., express empathic sadness).

Examination of relations between children's behavioural responding and their social adaptation showed that disengagement and affective responding were systematically related to their social competence: children who disengaged from the challenging vignettes most, and expressed worry-concern as opposed to empathic sadness, were more likely to be rated by their teachers as less socially mature and as having higher levels of problem behaviours. Furthermore, these same behaviours also predicted lower levels of peer acceptance. Longitudinally, only children's disengagement was systematically related to social adaptation. In fact, disengagement, which involves attentional modulation, emerged as a robust, stable and reliable predictor of children's social competence.

Finally, emotion regulation behaviours, empathy, and emotion understanding were simultaneously examined and found to be relatively distinct components of children's emotion competence. Furthermore, each component of emotional competence made independent contributions to concurrent and, to a lesser extent, longitudinal social competence as rated by both teachers and peers. However, only children's emotion regulation and affective expressions were related to teacher-rated problem behaviours at both time-points. Overall, the current thesis provides a framework within which to study young school-aged children's behavioural responses to challenging events, and has demonstrated that these responses make a unique contribution to children's social adaptation both in Kindergarten and one year later.

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## Chapter One

### The Emotion Regulation Construct

#### 1.1 Introduction

There is a complicated story to be told about the impact of emotional events on children, and their capacities to manage such events. This story is partly determined by the manner in which the child *regulates* his or her emotional responses. Indeed, such regulation is considered by many to be at the heart of successful social adaptation; children who are emotionally *well-regulated* are also thought to be well-equipped to manage complex social environments (e.g., Eisenberg & Fabes, 1992; Eisenberg, Spinard, et al., 2010; Halberstadt, Denham, & Dunsmore, 2001; Saarni, 1999). However, despite a large literature examining the development of children's emotion regulation and its relation to socio-emotional outcomes, the *emotion regulation* construct is difficult to grasp because attempts to define it allude to many different kinds of processes, and the emotion regulation literature is beset by theoretical inconsistencies and confusion (e.g., Cole, et al., 2004). In this thesis, I will use structured emotion elicitation paradigms to examine how children's experience and management of emotional events is related to their social adaptation upon school entry. In keeping with the extant literature, this thesis is driven by the broad expectation that children who have more optimal responses to evocative emotional events (i.e., adaptive emotion regulation) will also be more socially competent.

In order to develop the argument that adaptive emotion regulation is important for social functioning, which is implicitly accepted in various forms (Denham, 1998; Eisenberg, Hofer, & Vaughan, 2007; Saarni, 1999), it is necessary to first specify a framework for understanding children's responses to emotionally evocative events, and establish how such responses should, on the basis of existing research, be related to socio-emotional competence. The first three chapters of this thesis are directed to this goal. The present chapter is centred on definitional issues surrounding the emotion regulation construct. To make sense of children's responses to emotionally evocative events, the complex behavioural responses that can be directly observed in children in response to such events need to be

understood in terms of functions and processes that are explicable in terms of developmental accounts of emotional competence and emotion theory. Thus, in this chapter, I adopt a functionalist perspective on emotion in order to clarify the emotion regulation process, and discuss current accounts of emotion regulation in relation to important, closely related constructs; including *temperament*, *empathy* and *emotion understanding*. Once these conceptual issues have been set out, I then discuss how the emotion regulation construct has been related to children's social adaptation. Chapter 1, therefore, presents the global theoretical and empirical reasons to expect that an examination of children's experience and management of emotional events will yield important insights about individual differences in social competence.

Given the many processes involved in emotion regulation, as well as the definitional ambiguity surrounding this construct, the study of emotion regulation has been characterised by methodological diversity. Thus, in Chapter 2, the varied methodological approaches to the assessment of children's emotion regulation are examined, with a particular focus on observational measures of children's management of their emotional arousal when faced with challenging emotional events. Due to the close conceptual relation between children's emotion regulation, temperament and empathic responding, the methodological overlap between these measures is unpacked so that the behaviours that are likely to be of importance in emotion elicitation procedures can be better understood, and to further clarify the nature of the relation between children's emotion regulation and their social adaptation.

Based on the conceptual and methodological clarifications presented in Chapters 1 and 2 respectively, Chapter 3 presents a preliminary empirical study of children's experience and management of emotional events in an emotion elicitation paradigm depicting a simple mother-infant separation scenario by way of a video-based story vignette. This vignette is used to elicit and examine individual differences in behavioural and affective responses to an emotionally challenging but ordinary event in a sample of typically developing four- to five-year-old children, shortly before school entry. Of particular interest, children's behavioural and

affective responses are examined in relation to specific events in the unfolding emotional vignette; thus, behavioural and affective responses that have been previously identified in the extant literature because of their relevance for emotion regulation and adaptive functioning (Chapter 2) can be examined in the context of specific events unfolding in the story narrative. Chapter 3 also presents some initial data linking children's behavioural and emotional responses in the vignette paradigm to social conduct, as rated by mothers.

Chapters 1, 2 and 3 provide the conceptual and methodological framework adhered to in subsequent research presented in this thesis. The remaining empirical chapters (Chapters 4 through 9) present a longitudinal study of the relation between children's behavioural and affective responses to emotionally challenging events, and their social adaptation during the first years of formal schooling (Kindergarten to Year 1). Because the rationale for this longitudinal study hinges on the conceptual and methodological approaches presented in Chapters 1 to 3, a full rationale for that study is not presented until the conclusion of Chapter 3.

In the following sections, I first set out accepted notions of emotion regulation and examine these within a functionalist perspective on emotion, before considering important developmental perspectives on the growth of emotional competence. I then discuss emotion regulation in the context of temperament, empathy and emotion understanding, and consider relations between these constructs and young children's social competence.

## **1.2 The emotion regulation construct**

The majority of studies on children's emotion regulation adhere to the wide-ranging definition outlined by Thompson (1994) who states that, "... emotion regulation consists of the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (pp. 27-28). Thompson's definition has been utilised extensively within infant and child development research, and it will also form the starting point for the current discussion. There are several notable features of Thompson's definition, which are first discussed below.

Before considering refinements and alternatives to Thompson's perspective, however, I attempt to situate his definition within emotion theory, from a functionalist perspective (Section 1.2.2). This foray into emotion theory is important because it helps to illustrate the complexity of the emotion regulation construct, which is simultaneously oriented toward understanding individual differences in adaptation as well as fundamental, universal regulatory processes involving emotion systems. Following this discussion on the nature of emotion, I return to contemporary accounts of emotion regulation (Section 1.2.3) and I briefly outline the unfolding developmental contexts in which emotion regulation is studied (Section 1.2.4).

### **1.2.1 Thompson (1994) on emotion regulation**

As indicated above, there are several notable features of Thompson's definition of emotion regulation. First, Thompson emphasises that emotion regulation must be understood functionally. By placing emphasis on the use of regulation to accomplish goals, Thompson's definition necessitates a consideration of both motives and context when describing emotion regulation processes. Therefore, according to Thompson, in order to understand whether children are *well-regulated*, it is important to assess their abilities to enact regulatory strategies to effectively manage their emotional arousal in a given context, and flexibly apply these strategies over time to different environmental triggers in an appropriate manner.

The extent to which such abilities, and concomitant management strategies, are within the awareness of an individual is not specified by Thompson. This is probably because his account of emotion regulation covers infancy and toddlerhood, during which time children clearly act deliberately in the service of goals in emotionally challenging situations but without necessarily having any awareness of the regulatory process per se (e.g., Rothbart & Sheese, 2007; Sroufe, 1995). That is to say, the emotion regulation construct does not have to imply self-conscious or reflective processes of planful behaviour within the individual, although it certainly encompasses these processes through development. Indeed, the fact that emotion

regulation processes can be reflexive, deliberate and also playful makes any simple definition of emotion regulation elusive.

A very important implication of Thompson's focus on motives and goals, which is frequently overlooked in emotion regulation research, is that specific behavioural or emotional responses (e.g., aggression, sympathy, sadness, self-soothing behaviours, etc.) should not be considered inherently good or bad from the point of view of adaptive emotion regulation. Thus, an adaptive and appropriate regulatory strategy (e.g., self-soothing behaviours) at one age (e.g., nine months) or in one context (e.g., maternal separation) may be maladaptive at another age (e.g., five years) or in a different context (e.g., peer interaction). The contextual specificity of regulatory responses is at odds with the idea that certain types of regulatory behaviours are inherently more adaptive than others. Instead, it suggests that in order to understand the relation between specific regulatory responses and a child's competencies, a close examination of the situational context (including the motivational structure of the circumstances) is necessary.

The importance of situational context for understanding emotion regulation is particularly relevant when examining *dysregulation* (Cole, Michel, & Teti, 1994; Thompson & Calkins, 1996). Emotion dysregulation concerns existing regulatory strategies that are maladaptive and focus emotion onto inappropriate goals, thus further precipitating deviant and maladaptive behaviour (Ackerman, Abe, & Izard, 1998; Cole, Michel, et al., 1994). It is important to stress that even so-called "maladaptive" regulatory strategies almost certainly served an adaptive, functional role at some stage of development or in some important situational contexts for the individual. Nevertheless, such strategies have become sub-optimal or even counter-productive in new situational contexts, which may include different developmental stages or different social environments. Dysregulation is not, therefore, necessarily a lack of regulation. Rather, the notion of dysregulation captures regulatory strategies that are operating in a dysfunctional manner given the situational context or developmental stage of the child (Cole, Michel, et al., 1994). In sum, the concept of dysregulation further emphasises the importance of analysing emotion regulation as

a function of individual needs, as well as the situational context and the motives contained therein.

A second feature of Thompson's definition is that emotion regulation comprises both *intrinsic* and *extrinsic* influences, such that emotions may be managed by others as well as the self. This feature of emotion regulation is particularly relevant in infancy, when a great deal of a child's emotion regulation occurs in a dyadic context, between the infant and the caregiver. Thus, emotion regulation in Thompson's definition includes not only those behaviours and strategies employed to manage emotional arousal by the individual, but also external influences that may serve to manage arousal. The processes of dyadic emotion regulation have been given extensive treatment within attachment research (see Sroufe, 1995) and developmental psychopathology (e.g., Alink, Cicchetti, Kim, & Rogosch, 2009; Cole, Hall, & Radzioch, 2009; Cole, Michel, et al., 1994). Along with temperamental differences between individuals (see Section 1.3), extrinsic influences on emotion regulation, when consistently applied in a parenting context for example, almost certainly have enduring influences on the emotion regulation repertoire of individuals. I, therefore, return to this important perspective on emotion regulation in section 1.2.4 because of its relevance for understanding the persistent emphasis that developmental psychology places on the regulation of emotion.

A final important feature of Thompson's definition is that emotion regulation entails both the evaluation of an emotional experience and its management (Thompson, 1994; Thompson & Calkins, 1996). Indeed, this dual meaning of emotion regulation has been acknowledged by others. For example, Saarni (1999) states that emotion regulation is the, "... ability to manage one's subjective experience of emotion, especially its intensity and duration, and to manage strategically one's expression of emotion in communicative contexts" (p. 220). Both Saarni's and Thompson's definitions of emotion regulation shift seamlessly between emotion regulation conceptualised in terms of the strategies recruited to manage the emotional experience (whether instinctively or self-consciously), and the emotion experience per se.

Even a cursory glance at the construct of emotion regulation, therefore, suggests that it is conceptually complicated, and challenging to define. Two important issues emerge when attempting to understand the concept of emotion regulation as it has been used in the literature. First, it is not clear if a simple distinction can be made between the experience of an emotion and the management of emotion (Cole, et al., 2004). This is a crucial concern to which I will return in this thesis. Second, emotion regulation is a construct that deals with individual differences in responses to and the management of emotional challenges. Thus, the manner in which each individual manages their emotional responses must be the result, at least in part, of their unique constitution and their individual history of emotional experiences, including extrinsic socialisation influences and temperament (Calkins, 1994). Therefore, due to the complexities inherent in the concept of emotion regulation, this thesis begins with a broad overview of some theoretical issues that can help to structure thinking about the process of emotion regulation; in particular, a focus on the nature of emotion itself.

### **1.2.2 The nature of emotion**

While much has been written on the nature of emotion both in philosophy and psychology (see M. Lewis & Haviland-Jones, 2000; Solomon, 1993 for discussion), treatment of these issues is beyond the scope of this thesis. Rather, the current thesis broadly adopts a theoretical orientation best described as functionalist (Ekman, 2004; Holodyski & Friedlmeier, 2006). The functionalist perspective on emotion, which has its origins with Darwin (1872/1965), proposes that the capacity to experience an emotion has resulted from evolutionary processes, and serves an adaptive function by allowing us to better navigate and understand our physical and social environment. Within this view, there are three important features of emotion that are, arguably, fundamental to its nature. These are; (i) the universality of core (basic) emotions which can be characterised by distinctive expressions, (ii) the referential quality of emotion, and (iii) the experience of emotion as a subjective judgement. These features furnish adaptive emotion systems and are often given consideration in regards to specific challenges facing members of the species, such as survival in the face of threat. However, these

features also govern the day to day emotional encounters of children and thereby form part of the explanation of the development of individual competencies in situations that elicit strong emotion. Below, I examine each of these fundamental aspects of emotion in turn and broadly outline how these aspects of emotion shape a child's developing emotional competencies.

An evolutionary, functional perspective on emotion entails that emotions, at least to some degree, have a biological basis and precipitate certain kinds of predictable actions/behaviours that are likely to furnish adaptive responses to distinctive kinds of situations. Thus, situations of existential threat provoke fear, which initiates so-called "flight" responses, and perhaps also anger, which initiates so-called "fight" responses. These relations, in conjunction with the signalling functions of emotional expressions, prompt the claim that there exists a set of categorical basic emotions that are universally expressed, recognised and understood in terms of their motivational salience (Ekman & Davidson, 1994). In keeping with this claim, it follows that even young infants should quickly have a structured emotional repertoire, in terms of their production of and response to specific emotion expressions (for a discussion see Harris, 1989, Izard & Harris, 1995). Despite considerable research in this area, however, it is still unclear to what extent emotional expressions are entirely predetermined, what the time table of their appearance is, and what the underlying mechanisms supporting their appearance are (Harris, 2006). Nonetheless, infants quickly produce basic, discrete expressions (joy, sadness, fear, anger and disgust) and, regardless of the innateness of infant understanding of such expressions, there is good evidence that even young infants are behaviourally guided in appropriate ways by emotional expressions (Moses, Baldwin, Rosicky, & Tidball, 2001). Thus, various research paradigms, such as the visual cliff (Sorce, Emde, Campos, & Klinnert, 1985), biscuit removal (Stenberg, Campos, & Emde, 1983) and contrasting emotion expressions (Haviland & Lelwica, 1987), offer good evidence that by six to eight months of age, and probably before, infants produce specific emotion expressions that are sensibly associated with distinctive kinds of situations (e.g., biscuit removal results in anger expressions) and they discriminate between different kinds of emotional experiences. Furthermore,

caregiver's specific emotion expressions have different organisational effects on infant behaviour (Haviland & Lelwica, 1987; Trevarthen, 1979). These data suggest that infants understand, in a very basic but nonetheless profound manner, the motivational salience of emotion expressions (Campos, Thein, & Owen, 2003; Izard & Harris, 1995). This early, rudimentary knowledge of emotion is thought to provide the foundation for the more complex understanding of emotion that develops over early childhood (Harris, 1989).

The second aspect of emotion emphasised within the functionalist account is the inherently referential nature of emotion; that is, emotions are always *of* or *about* certain aspects of the relationship between the person and the environment (Frijda, 2004; Lazarus, 2003; Solomon, 2003). In this manner, each elicitation of emotion is bound to a context within which it occurs, and refers to an eliciting event, whether it be an object (person, thing or situation), a realisation of a personal goal, or an interpersonal encounter. The referential nature of emotion means that emotional experiences are inherently related to the context in which such emotions are/were experienced. That is to say, emotion does not exist as an isolated phenomenon, it will always involve a relation between a person and a context, even when it is recalled or evoked at some future time. Indeed, young children behave as though they are able to understand the referential nature of emotions relatively early in development. Prior to such referential understanding, while the infant may understand the salience of caregiver expressions for their own behaviour, and in the context of dyadic communication (e.g., *intersubjective* exchanges in Trevarthen's terms; Trevarthen, 1979), the emotional display of the caregiver need not necessarily refer to a particular object or situation that is the focus of shared attention. That is, the caregiver's emotional expression may modify the young infant's behaviour because of the emotional tone of the expression; a positive expression is affiliative and may draw the child nearer, while a fearful expression may end the infant's exploration (Harris, 2006). These simple relations are commonly observed before six months, and are certainly still evident at 12 months.

However, with a full referential understanding of emotion that incorporates objects of shared attention, older infants are able to interpret the caregiver's

emotional responses as selectively referring to specific things, including social objects, and then use the caregiver's emotional response to inform and adjust their own emotional stance toward the object (Campos, et al., 2003; Harris, 1994). While shared attention is certainly developing well before 12 months of age (Moore, 1999; Moore & Dunham, 1995), there is very good evidence to show that, by 12 months of age, children are able to respond to a specific object in the environment in a manner that is consistent with the caregiver's (or a confederate's) emotional response to that object (Feinman & Lewis, 1983; Moses, et al., 2001). For example, if a caregiver expresses a negative emotion toward an object in the environment, the infant is more likely to selectively retreat from or avoid that object. Thus, whereas the caregiver's emotion expressions may have had a regulatory effect on the infant prior to 12 months (in terms of experienced affect and behavioural organisation), the onset of a referential understanding of emotion means that the infant, toddler or young child, can use his/her caregiver's expressions of emotion to *regulate* their own behaviour.

The referential nature of emotion binds an emotional response to the eliciting environment. However, the manner by which an individual interprets or appraises the environment also has a bearing on the emotional experience. Indeed, just because an infant can understand the referential nature of a caregiver's emotion expression by no means implies that they will use such information. As a result, emotions are both bound to their eliciting context and are also a subjective interpretation of that context. Solomon (2003) proposes that emotional responses to the environment may be understood as an individual's judgement of their current environment (see also Ekman, 1999; Lazarus, 2006). If the environment is judged as advantageous or favourable then a positive emotion may be felt. The same environment may, however, thwart the personal goals of another, in which case a negative emotion may be felt. It should be emphasised that this process is not a judgement about the provoked emotion, but rather it is a subjective judgement about the state of the world and how the current state relates to oneself. With development, young children begin to grasp this fundamental characteristic of

emotion; they understand that the emotional reaction of another depends upon that person's desires, beliefs and goals with respect to their situation (Harris, 1994).

The referential and subjective nature of emotion highlight the importance of understanding an emotional response in context. In order to understand whether an individual's emotional response to a given situation is more or less optimal, well-regulated or dysregulated, it is not enough to know what their emotion is. Rather, something needs to be understood about the function of that emotional response in the eliciting context, and in light of the individual's interpretation, goals and probably also motives.

Within a functionalist view, the universality of emotion, along with its referential and subjective nature, structure an individual's interactions with the environment such that the experience of an emotion often prompts a tendency to act in certain kinds of predictable ways (Frijda, 2004). Emotion and action are inextricably linked when examined through the functionalist framework. As emotions serve to allow us to better adapt to our environment, the elicitation of an emotion, therefore, should necessarily set in motion behavioural responses to the eliciting environmental conditions. If these resulting behavioural responses are effective, then they allow the individual to manage both the unfolding environmental condition and also the experience of emotional arousal itself. In fact, highlighting the importance of action tendencies, Frijda (2004) proposes that, "... emotions exist for the sake of action" (p. 170). The functionalist perspective views emotions as guiding, enabling and organising adaptive responses to the environment (Ekman, 1999; Izard, 1989; Lazarus, 2006). The appraisals and action tendencies that are linked with an elicited emotion therefore modify the individual's relation with the environment and almost certainly alter the individual's emotional experience. Thus, the very nature of an emotional response is regulatory.

The inherently regulatory nature of emotion immediately highlights a potential problem when differentiating the experience of an emotion from the regulation of emotion. In an attempt to overcome this definitional confusion, Cole, Martin and Dennis (2004) propose that emotions are both regulating and regulated. This is a point which I shall return to in Section 1.2.3. Furthermore, emotional

arousal not only has the power to trigger an individual's own behaviour, it can also prompt and organise the behaviours of others. Thompson (1994) acknowledges this feature of emotion in his definition of emotion regulation. For example, the infant's expression of distress may motivate the caregiver to enact behaviours that alleviate the infant's discomfort and, thus, regulate the infant's emotional experience. By toddlerhood, children begin to appropriately respond to another's emotional arousal and are sometimes able to enact behaviours that modify emotional arousal in others (Harris, 1989). This capacity in very young children was vividly illustrated by Zahn-Waxler and colleagues (1992), who showed that the overt display of distress in another prompted toddlers to enact care-giving behaviours to attenuate the observed distress. Such precocious care-giving behavioural responses to the distress of others are often understood as *empathy* (e.g., Hastings, Zahn-Waxler, Usher, Robinson, & Bridges, 2000; Strayer, 1980; Zahn-Waxler, et al., 1992). By enacting empathic care-giving behaviours toddlers in fact demonstrate that they understand that emotions may be modified and managed, both through interpersonal contact, as well as by altering the context in which the emotion is triggered. Of course, there are various ways in which such early expressions of empathic behaviour can be explained, such as by imitative mechanisms or socialisation. Doubtless such processes are of significance but they are unlikely, on their own, to provide a full account of children's responses because available research strongly suggest that the impetus for nascent empathic behaviour lies in the child's emotional response to the situation (e.g., Eisenberg, 2000b; Harris, 1989; Hoffman, 1982; Zahn-Waxler & Radke-Yarrow, 1990). Two different accounts of how this might occur are given below in Section 1.3.2. At this point in the discussion it is just important to stress that empathy, when seen in this light, serves a function normally given consideration within the domain of emotion regulation.

Despite the functional nature of emotion, emotional responses and their associated behavioural tendencies need not always be optimally adaptive to the emotion eliciting context. Indeed, the fact that emotion systems have, in evolutionary terms, emerged to provide flexible, adaptive response systems by no means implies that such responses are always optimal, socially appropriate or

helpful; it merely implies that, probabilistically, such responses are likely to furnish adaptive change. In fact, Frijda (1994) argues that although emotions serve an adaptive function in general, not all instances of emotion serve a useful purpose. Thus, in addition to being inherently regulatory, emotions must also at times be directly regulated so that the experience of an emotion does not hinder the effectiveness of one's actions. The fact that emotions serve to structure and organise (i.e., regulate) our relation to the environment but must also be directly regulated in certain instances, reveals a complicated problem; there is a pervasive difficulty separating emotion regulation from the experience of an emotion itself.

In the following section I return to the construct of emotion regulation and examine the theoretical difficulties encountered when attempting to delineate the processes of emotion and emotion regulation. Following this review, I examine emotion regulation in the context of the child's broad emotional history, with a specific focus on the relation between emotion regulation and temperament.

### **1.2.3 The nature of emotion regulation**

As has been briefly examined above, there are two senses in which the concept of emotion regulation has been understood (Campos, Mumme, Kermoian, & Campos, 1994; Garber & Dodge, 1991; Gross & Thompson, 2007):

(A) Drawing on emotion theory, it is clear that the very nature of an emotional response is regulatory. That is, an emotion elicitation structures and organises the organism's response to the environment and, thereby, to some extent determines the response. This is viewed as an adaptive function which has its origins in our evolutionary history.

(B) By contrast, emotion can also be conceptualised as something that is *regulated*. In the context of children's social adaptation, this is the more familiar sense of the emotion regulation terminology. The basic idea is that when an emotion is experienced, it becomes something that needs to be dealt with, managed or modulated.

To understand the appeal, and also the limitations, of this dichotomy, take the apparently simple example of a child who is approached by a large unpredictable dog. He or she will likely feel fearful of the dog. Adopting the initial sense of emotion

regulation (A), the fear is an evaluation or judgement about the relation between the child and the environment that is likely to result in some form of adaptive behaviour, for example, seeking protection. Seeking protection will, it should be noted, reduce the feeling of fear, and thereby fits squarely within the second sense of emotion regulation (B), albeit in a very simple fashion. Consider, however, a child who has some burgeoning awareness of his or her own emotional response to the situation. In this case, the child may realise that the management of his or her fear may be anticipated and managed in the service of specific goals. One such goal might be to avoid the dog, and thus the fear, by engaging in anticipatory protective behaviours. Again, this fits squarely within the second sense of emotion regulation (B) but now entails richer cognitive functions, such as anticipation and strategic behaviour.

Yet, another child meeting the same dog, however, may have the goal to interact with the dog. In this case, mastery of the fearful component of the situational context might yield a positive experience (i.e., playing with the dog) rather than a negative one. To achieve the goal of *playing with the dog*, the child may need to strategically manage the feeling of fear. In this final scenario, which also fits squarely within the second definition of emotion regulation (B), the child's anticipation and strategic behaviours in the service of his or her goal (i.e., to play with the dog), will likely transform a situation that contained fearful aspects to one that entails pleasure and mastery. Thus, whilst the sensation of fear serves adaptive functions, the benefit of the phylogenetically determined behavioural response that originates from the fear (e.g., seeking protection) may need to be balanced against; (i) the desire for the feeling of fear to cease, and/or (ii) other motivations and goals that extend from the situation.

Two important issues facing emotion regulation research can be drawn from this example. First, for someone observing this meeting of child and dog, the process of emotion regulation is difficult to accurately delineate from the experience of an emotion. This problem can be characterised as both a theoretical and empirical difficulty in determining exactly when an individual begins to experience an emotion, and when he/she begins to regulate this emotional experience (Hessler & Katz,

2007). To overcome this difficulty, many researchers force a conceptualisation of emotion regulation as a two-part process, the child first experiences an emotion and then, secondly, attempts to regulate it, thus allowing emotion regulation to be measured independently from emotion (e.g., Buss & Goldsmith, 1998; Calkins & Johnson, 1998; Cole, et al., 2004; Stifter & Braungart, 1995). Of course, this process can also be hypothesised to involve feedback loops or properties, such as those described by Gross (2002; Gross & Thompson, 2007)

Whilst the solution proposed above is attractive, it inadvertently reveals the second knotted issue facing the emotion regulation construct. For instance, if we could tease apart the experienced emotion (see A, above) from the individual's attempt to regulate the experienced emotion (see B, above), the fact remains that the experienced emotion would almost certainly be different for each child: not all children will find the large dog equally scary and some may not find it scary at all. So the notion that the situation has equivalence across children, and thereby requires equivalent regulatory modulation, is flawed. That is, the valence and intensity of the elicited emotion will clearly determine the manner in which the emotion must be regulated, so if this is not comparable between children, any subsequent regulatory behaviours are non-equivalent because they reflect qualitatively different relations between the child and the environment. In typical studies of emotion regulation, children are often presented with an emotion-eliciting situation and their regulatory strategies are assessed. This approach presumes that children are 'regulating' the same elicited emotional response. However, the same emotion-eliciting situation may mean different things to children depending on their temperament, emotional history and socialisation experiences. I take up this discussion separately below.

The difficulty encountered by the emotion regulation literature in separating emotion regulation from the concept of emotion itself is clearly captured in the definitions of emotion regulation put forward by Saarni (1999) and Thompson (1994), as outlined above (Section 1.2.1). Furthermore, this issue is addressed in the major theoretical review by Cole, Martin and Dennis (2004). Cole et al. endeavour to develop a working definition of emotion regulation to allow for the development of methodologies and evaluation of research in emotion regulation. In keeping with

Thompson (1994), they define emotion regulation as changes associated with activated emotions, and do so by explicating two distinct but related regulatory components; 'emotion as regulating' and 'emotion as regulated'. Emotion-as-regulating refers to, "... changes that appear to result from the activated emotion" (p. 320), and is analogous to the first conceptualisation of emotion presented above (A). These changes include those associated with emotion functions, such as cardiovascular activity and other physiological indices of emotion processing (e.g., vagal tone), as well as changes associated with other functions, such as subsequent adaptive emotion-related behaviours. Cole et al. (2004) contend that this relation between emotion and its subsequent responses may, in fact, reflect the, "... systemic nature of emotion rather than an independent emotion regulating a separate system" (p. 321).

Emotion-as-regulated, in comparison, refers to, "... changes in the activated emotion" (p. 321), whereby the activated emotion is modified through the regulatory strategies of the self or others, and is analogous to the second conceptualisation of emotion regulation outlined above (B). For example, emotion-as-regulated includes behaviours, enacted by either the child or the parent, to directly reduce distress. However, emotion-as-regulating and emotion-as-regulated are intimately related both concurrently and also through development; when a triggered emotion leads to behavioural change (emotion-as-regulating) it also feeds back to modulate the experience of the emotion (emotion-as-regulated), and these processes are likely to have been influenced by the historical management of the child (e.g., Gunnar & Loman, 2010).

Appealing though the distinction between emotion-as-regulating and emotion-as-regulated may be, it has been challenged by some major emotion theorists (e.g., Campos, Frankel, & Camras, 2004; Frijda, 1986; Holodynski & Friedlmeier, 2006; Stansbury & Gunnar, 1994), and suffers the same problems discussed above. In particular, Campos et al. (2004) have a conceptual objection to the division of emotion and emotion regulation, instead claiming that they are inextricable. They offer a unitary model of emotion explaining both emotion and emotion regulation as, "... conjoined from the beginning as one observable process

[...] reflecting the attempt by the person to adapt to the problems he or she encounters in the world” (p. 379). In this unitary model, emotion and emotion regulation occur concurrently throughout the entire emotional experience.

To this point, I have focused primarily on the abstract notion of emotion regulation. In the following section, I examine the development of children’s emotion regulation with a particular emphasis on the shift from dyadic emotion regulation between the infant and caregiver, to the young child’s self-directed regulation of emotional arousal. A focus on extrinsic factors (Thompson, 1994) influencing the development of emotion regulation in the young child can help to shed light on the different conceptualisations of emotion regulation outlined above. In particular, the merit of Cole’s delineation between emotion-as-regulating and emotion-as-regulated becomes more apparent when emotion regulation is seen in a truly developmental context.

#### **1.2.4 The extrinsic context for emotion regulation: A focus on development**

To a great extent, children’s emotion regulation has origins in early interactions with the caregiver, which takes on a predictable form or *organization* over time (Calkins, 1994; Izard & Harris, 1995; Kopp, 1989; Sroufe, 1995; Tronick, 2007). Much has been written on this topic that cannot be given adequate treatment in the context of this discussion. Here, my purpose is to give a sketch of some normative developmental milestones and behaviours that occur in the dyadic context so as to illustrate various developmental processes and transitions that are important for the current thesis.

Infants do have internal resources (e.g., avoidance and self-soothing behaviours) to deal with emotionally powerful situations, and these behaviours are given consideration in Chapter 2. However, children also rely heavily on their caregivers to directly regulate their emotional arousal. When faced with frustration, for example, infants can attempt to avoid the source of frustration, but they may also rely on a caregiver to modulate the experienced emotion. The degree to which the caregiver assists the young infant in regulating their arousal and the manner in which they achieve this over time will facilitate the development of further regulatory capacities in the child (Sroufe, 1995). Conversely, if the caregiver

escalates or is unresponsive to the infant's emotional arousal, it is more likely that the infant will encounter difficulties learning to appropriately regulate his or her own distress and frustration later in development (Izard & Harris, 1995; Saarni, 1999).

Perhaps more than any other theoretical perspective, attachment theory emphasises the important role played by interpersonal relationships in development (Bretherton & Munholland, 1999). The consequences of the infant's attachment relationship for the development of self-directed emotion regulation has received sustained attention (see Calkins, 1994; Sroufe, 1995). Children with responsive and sensitive caregivers are likely to have interactions with their caregivers that result in effective dyadic emotion regulation. Sroufe (1995) argues that this enduring pattern of responsiveness becomes internalised by the child and forms the foundation for adaptive and flexible self-directed emotion regulation, which is characteristic of securely attached children. Thus, the early attachment relationship between the infant and their caregiver shapes the manner in which the young child is able to adaptively cope with emotionally challenging situations later in life; particularly interpersonal interactions (Cassidy, 1994; Sroufe, 1983; Sroufe, 1995; Waters et al., 2010). For example, Gilliom et al. (2002) found that children with secure attachment at 18 months were more likely to employ effective emotion regulation strategies when faced with emotionally challenging events at three years of age. Similar relations between secure attachment and adaptive emotion regulation have been found for school-aged children (Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000) and adolescents (Kobak & Sceery, 1988).

In addition to the attachment relationship, broader family characteristics, including the expression of emotion in the home, caregiver's responsiveness to the child's expressed emotion, and caregiver discussion of emotion, have also been found to have an enduring impact on the development of children's emotion regulation (for a review see Eisenberg, Cumberland, & Spinrad, 1998; Morris, Silk, Steinberg, Myers, & Robinson, 2007). The processes underpinning such influences begin very early (e.g., Murray, Cooper, Creswell, Schofield, & Sack, 2007). From approximately nine months of age, for example, infants take an increasingly active role in the processes of dyadic emotion regulation with their caregiver, a practice

that progressively involves more sophisticated social referencing processes (Feinman & Lewis, 1983; Sroufe, 1995). As outlined in Section 1.2.2, by means of social referencing the young child is able to pick up on the information contained within a caregiver's emotional response and use such information to manage their own behavioural response to the environment. While demonstrations of social referencing represent single instances of dyadic emotion regulation, it is likely that, over time, distinctive styles of caregiver responding become incorporated into the child's regulatory repertoire. In a powerful illustration of this, Murray et al. (2008) showed that infants of socially anxious mothers were more likely to avoid social interactions with a new person by 14 months. These children, who were no different to infants of non-socially anxious mothers at 10 months, apparently came to internalise their mother's wariness of new social situations over the period in which social referencing processes become prominent. Examples such as this clearly illustrate the enduring influence of the child's socialisation environment. The process of dyadic emotion regulation evident in the attachment relationship, and the cumulative influence of emotional experiences over time, ultimately mean that children will come to encounter the same situations differently, and seek out different kinds of resolutions to emotionally challenging events (Izard & Harris, 1995; Sroufe, 1995).

This brief discussion of the extrinsic context of emotion regulation quickly illustrates a third issue faced by the emotion regulation construct. Because of the profound individual differences in children's socialisation histories, their observed responses to an emotional event must be, to some extent, a function of their individual experience. This fact further obscures differences between emotion and emotion regulation, as discussed above, because a child embodies a lifetime of regulation and, therefore, once again it is clear that the same situations will mean different things to individual children.

When seen in this way, a developmental approach to emotion regulation does shed light on the merit of Cole et al.'s (2004) demarcation of the emotion experience from emotion regulation. This distinction applies within a truly developmental orientation of emotion regulation; the infant expresses an emotion

while the caregiver enacts behaviours that serve to regulate this emotional response. However, this distinction becomes difficult to apply to an instance of more complex, self-directed regulatory processes observed in the older child. In this later case, the unitary model of emotion regulation offered by Campos et al. (2004) and others (Frijda, 1986; Holodynski & Friedlmeier, 2006; Stansbury & Gunnar, 1994) is probably more suitable, even if it presupposes the developmentally meaningful distinction between emotion-as-regulating and emotion-as-regulated.

The unitary model of emotion and emotion regulation emphasises the *completeness* of the child's emotional response. That is, irrespective of the child's socialisation history, the response from the child in a given moment, comprising both the experience of emotion and its regulation, must be examined in its entirety. Thus, while it is crucial to keep in mind, for example, the influence of parental sensitivity for children's developing emotion regulation abilities, another means by which to explore the development of children's emotion regulation is to examine what infants and young children actually *do* in challenging situations. This is, in fact, the essence of Ainsworth's (Ainsworth, Blehar, Waters, & Wall, 1978) strange situation procedure which contributed so richly to attachment research. Accordingly, if we want to understand something meaningful about children's emotional response to a challenging event we can do this via direct observation so long as children's responses can be meaningfully interpreted. To achieve this, children's behavioural and affective responses need to be considered within a theoretical framework of optimal emotion regulation and the context in which those responses are observed needs to be appropriate and relevant. In this thesis, children's behavioural and affective responses will be observed during challenging events that are theoretically relevant to their social adaptation.

### **1.2.5 Summary**

Thus far, I have explored theoretical issues surrounding the emotion regulation construct, and have drawn upon the functionalist perspective on emotion to help clarify the processes involved in emotion regulation. The major problem facing the emotion regulation construct is a difficulty in conceptually delineating the different processes of emotion regulation, that is emotion-as-regulating and

emotion-as-regulated. Within a developmental framework, this distinction becomes easier to conceptualise because it can be more clearly explicated in the relationship between the infant (or young child) and the caregiver. Indeed, throughout the lifespan it is possible to find many situations in which emotion regulation is achieved via extrinsic mechanisms. However, with the development of more sophisticated and self-directed regulatory strategies the demarcation between an experienced emotion and its regulation breaks down.

Although there are clear developmental changes that have far-reaching and predictable implications for children's regulatory capacities, there are nonetheless profound individual differences in children's emotion regulation. While there has been a suggestion of the importance of individual differences for the development of adaptive emotion regulation, this discussion has been limited to differences in the child's family environment. In the following section (Section 1.3), important individual differences in children's own responding to emotional events will be examined in relation to developing regulatory abilities. In particular, children's temperamental characteristics and empathy will be examined in association with the emotion regulation construct.

### **1.3 The limits of the emotion regulation construct: Relations with temperament and empathy**

Although the development of emotion regulation, shaped to some extent by the dyadic relation between the child and caregiver, may follow a typical and predictable path in early childhood, individual differences in emotion regulation are also influenced by intrinsic child characteristics. In particular, children's temperament has been shown to be intimately related to their developing abilities to appropriately regulate emotion, and is thus often examined in conjunction with emotion regulation. In addition, although it is not common, differences in children's empathic responses may be considered as a function of their emotion regulation. An examination of the empathy construct from an emotion regulation perspective is particularly important for the current thesis. The following section examines the

emotion regulation construct from the perspective of both temperament and empathy.

### **1.3.1 Temperament**

Temperament refers to individual differences in children's emotional reactivity and self-regulation and, as such, an understanding of temperamental factors can reveal much about emotion regulation (Rothbart & Sheese, 2007). Two aspects of temperament in particular, *emotionality* and *effortful control*, have been closely examined in conjunction with emotion regulation. However, the examination of the relation between emotion regulation and temperament is complicated by the fact that emotionality and effortful control have been understood both as important influences on emotion regulation and processes of emotion regulation itself. For example, it is difficult, perhaps even impossible, to differentiate between a child who is low on arousability (i.e., emotionality) and a child who is well-regulated (Underwood, 1997). Perhaps in acknowledgement of this inherent problem, Rothbart and Sheese (2007) note that they,

“... do not treat temperament and emotion regulation as distinct entities, nor [...] claim that temperament causes emotion regulation, or that emotion regulation causes temperament” (p. 333).

As a result, the constructs of emotionality and effortful control are often examined alongside emotion regulation. The overlapping methodological approaches to assessing emotion regulation and temperament are discussed in Chapter 2.

Emotionality is argued to reflect individual differences in the threshold, intensity and recovery of emotional reactions (Goldsmith et al., 1987; Rothbart, 1989). That is, emotionality is the tendency to express and experience emotions in a certain manner and has been found to be a stable temperamental disposition across childhood (Murphy, Eisenberg, Fabes, Shepard, & Guthrie, 1999). Emotionality is construed, therefore, as an enduring characteristic that shapes children's perceptions and experience of all aspects their emotional life. Because emotionality is considered an important index of emotion regulation processes the ability to manage emotional expressions is a fundamental characteristic of well-regulated

children (Cole, Michel, et al., 1994). The expression of negative emotions, in particular, has been examined in relation to emotion regulation. Eisenberg has argued that negative emotionality, often conceptualised as extreme negative emotional reactions, is an important moderator of children's abilities to adaptively regulate emotional responses (Eisenberg et al., 2001; Eisenberg et al., 1997). Thus, she explains that the extent to which an individual child expresses their temperamental predisposition toward negative emotionality may be tempered by his or her abilities to regulate emotion. That is, the dysregulating effect of intense negative emotions may be less debilitating for a child who is able to adaptively regulate his/her emotional responses in other ways, compared to a child who has both a temperamental predisposition toward the expression of intense negative emotions and poor regulatory skills in other domains (Eisenberg, et al., 1997). It is, however, clearly difficult to distinguish between a child who has a tendency towards the expression of negative emotion and is well-regulated, and a child who may be less well-regulated but does not tend to express negative emotions. This is an enduring circular problem for the temperament and emotion regulation literature.

Effortful control has also been closely examined alongside children's abilities to appropriately manage emotional responses. Rothbart and Sheese (2007) conceptualise effortful control as a broad self-regulatory capacity comprising both attentional control and inhibitory skills. That is, effortful control is crucial for self-regulation more broadly construed, not just in an emotional context. Both Rothbart and Sheese (2007) and Eisenberg et al. (2007) stress the close relation between children's effortful control and their ability to adaptively regulate their emotional experience, and conceptualise effortful control as underpinning children's abilities to regulate emotional responses (see also Kochanska, Murray, & Harlan, 2000; Posner & Rothbart, 2000). For example, children with high effortful control are less likely to experience negative emotionality, most likely due to the fact they are able to better manage their attentional and behavioural responses (Eisenberg, Fabes, Guthrie, et al., 1996; Liew, Eisenberg, & Reiser, 2004). The relation between effortful control and emotion regulation is further demonstrated by the finding that children with greater effortful control are better able to appropriately manage their emotional

expressions (Kieras, Tobin, Graziano, & Rothbart, 2005). In this sense, effortful control reflects a skill that both helps children regulate their emotions, as well as a temperamental difference in self-regulation in responding across non-emotional (e.g., while completing a difficult puzzle) and emotional (e.g., when faced with a disappointing gift) contexts (Carlson & Wang, 2007).

Clearly, on the basis of the kind of data presented above, one has to conclude that there is an intimate relation between emotion regulation and temperament, and there is substantial conceptual and methodological conflation in the literature between these two constructs. One means by which to separate emotion regulation from temperament is by returning to the functionalist definition of emotion and emotion regulation. Within the functionalist perspective of emotion, a child's regulation is understood within the context of a single event; that is, emotion regulation is contextually-bound. Conversely, temperament is an enduring proclivity toward certain responses and the expression of specific emotions. For example, children with the temperamental constitution of negative emotionality have a tendency toward the experience and expressions of negative emotions across all contexts. In the current thesis, on the basis of the contextually bound nature of emotion regulation, emotion regulation and temperament will be treated as distinct.

Individual differences in children's temperament, much like their attachment relationships, highlight the fact that emotion regulation is not only determined by those factors that relate to an individual instance of emotional arousal. That is, while the contextual particulars of an emotionally challenging event influence the manner by which children regulate their arousal, children bring with them their emotional tendencies and styles of regulation that are a function of their own individual emotional experiences and temperamental predispositions, thereby structuring their subsequent regulatory capacities. Thus, the manner in which we understand how a child deals with an emotionally challenging situation very much depends on the lens we adopt. If we see a child's emotional responses to an event as an expression of temperament, then it is probably adequate to consider the way they respond to such an event when compared to other children, although we will want to know something about the extent to which such a response can be generalised to other

situations. If, on the other hand, we see a child's response to an event as an expression of their history of interpersonal relationships, for example, then we will ultimately need to provide an explanation about the kinds of interactions that made such a response more likely. In either case, we need to know whether the child's response is indicative of a specific situational context. Perhaps the most commonly studied situational context is one involving empathy, as a result, the following section examines the overlapping nature of emotion regulation and empathy.

### **1.3.2 Empathy**

Children experience emotion not only directly from their own experience but also vicariously through the observed emotional arousal of another. In both instances, emotional arousal must be managed appropriately. While the emotion regulation literature examines children's regulation of arousal under all emotionally challenging conditions, the empathy literature focuses specifically on children's emotional responding and the management of their arousal in response to the suffering or distress of another. The manner by which children respond to the negative emotion observed in another is considered indicative of their empathic orientation (Eisenberg & Fabes, 1992). An *empathic response* is most commonly defined as a child's emotional response resulting from the emotions experienced by another person, and of a similar quality to the other person's emotions (Eisenberg & Strayer, 1987; Hoffman, 1982; Strayer, 1989). An *empathic child* is one who, on the basis of such an emotional response, feels or acts in sympathetic ways toward the other person. Thus, research into a child's empathic response to another's plight can arguably be viewed as a specific subset of research concerned with a child's emotion regulation, albeit in a narrowly defined eliciting context (see Section 1.2.2 above). Below, I expand upon this conceptualisation of empathy in the context of existing research on both empathy and emotion regulation.

Eisenberg and Fabes (1992) present a theoretical framework that speaks directly to the relation between children's emotion regulation and their empathy. They have argued that in order to be empathic children must be emotionally well-regulated (e.g., Eisenberg, 2000b; Eisenberg & Fabes, 1990; Eisenberg, Fabes, Murphy, et al., 1996; Liew et al., 2003). Thus, Eisenberg and colleagues imply that

empathy is a function of the child's regulatory skill. As a result, children who are well-regulated should be able to vicariously experience the emotion of another (i.e., experience affective empathy) without becoming too distressed themselves. If children are emotionally overwhelmed or too rigidly regulated when faced with the plight of another, they are unlikely to experience empathy. Within Eisenberg and Fabes' (1992) conceptualisation there is an intimate connection between emotion regulation and empathy, but they are essentially different processes; it is necessary to be well-regulated in order to be an empathic person. Note, however, the Eisenberg and Fabes (1992) need at least two senses of empathy. There is the initial, rapid empathic arousal; that is, the emotion initially provoked in the child in response to another person that needs to be regulated. Upon such regulation of the initial response, the second and more familiar sense of empathy comes into play; that is, the well-regulated empathic feelings directed toward the other person's predicament. For clarity Eisenberg (2000b) labels this second sense of empathy as *sympathy*.

Studies on the link between emotion regulation and empathy have offered broad support for this relationship. Children likely to enact adaptive and functional regulatory strategies to manage their arousal are more likely to experience affective empathy, typically conceptualised as an emotional response that is similar to that of the individual in distress, furthermore, well-regulated children are likely to enact behaviours that minimise the distress of others (Eisenberg & Eggum, 2009; Eisenberg, Fabes, Murphy, et al., 1996; Gurthrie et al., 1997). Within Eisenberg's framework, while there is a close association between emotion regulation and empathy, emotion regulation is a necessary but not sufficient condition for empathy; a child may be well regulated but may not necessarily respond to the emotional plight of another with empathy.

Empathy, however, is not simply an affective response to the emotional plight of another, it also includes an awareness of the situational context from the other person's perspective (Hoffman, 1984). Thus, while empathy is an emotional response to another's distress, like any emotional response it is mediated by cognitive appraisals regarding the unfolding event (Strayer, 1989). The empathy

literature takes as its starting assumption the fact that children's responses to another person's distress are informed by their emotional reactions to the observed distress, as well as their ability to understand the context in which the distress occurs from the point of view of the other person. Hoffman (1982, 1984) proposes that as children's socio-cognitive understanding develops the vicarious affect aroused when faced with the distress of another is experienced differently. To understand this process fully, it is helpful to start in infancy, at which time children respond to the emotional distress of others with emotion contagion. For example, Sagi and Hoffman (1976) have shown that newborn infants cry in response to the sound of another infant's cry. In Hoffman's (1982) view, such contagion is the first step in empathy development. As the infant becomes more sophisticated and moves into childhood, he or she increasingly acquires the ability to see emotional distress from the other person's point of view and, thus, truly experience mature empathy.

Harris (1989), like Hoffman (1984), also includes the cognitive component in his developmental account of empathy but he does so in a different manner. Harris (1989) argues that it is children's developing socio-cognitive understanding, fuelled by their imaginative capacity, that assists them to respond to another's emotional distress with empathy. The difference between Harris's account of empathy and those of Eisenberg and Hoffman is subtle but, nonetheless, important. In Harris' account, children's nascent perspective taking skills allow them to appreciate the psychological sources for their own and other's emotional displays, which in turn enables them to respond to the emotional challenge in a well-regulated manner (Harris, 1989). In this sense, it is children's understanding of mind and emotion that provides them the emotional separation needed to reduce or avoid the contagion of negative affect, and respond in a well-regulated, empathic way. Importantly, there is nothing empathic about emotional contagion, in the sense that we normally understand empathy. Rather, perspective taking abilities allow the child to break the connection of emotion contagion or never experience it, and set in motion the potential for empathic feelings directed to the other person's predicament. Thus, in Harris' account of children's developing empathy, it is the empathic response itself (which has its basis in a cognitive appraisal) that has a regulatory function.

There is empirical support for Harris' argument, with children able to respond empathically without apparently experiencing any negative emotion themselves (Harris, 1989; Vaish, Carpenter, & Tomasello, 2009). Furthermore, children with greater perspective taking skills and emotional insights have been shown to be more likely to experience empathy and engage in empathic behaviours (e.g., Carlo, Knight, Eisenberg, & Rotenberg, 1991; Roberts & Strayer, 1996). For example, in a longitudinal study, Zahn-Waxler and colleagues (1992) observed that with increasing age toddlers were more likely to comfort a sibling in distress, rather than expressing distress themselves, a change that coincided with the development of perspective taking skills in toddlerhood. In addition, Strayer (1980), in a study examining the relation between naturally occurring instances of empathy and perspective taking skills in preschoolers, found a modest relation between children who demonstrated greater empathy when interacting with their peers and greater perspective taking skills.

Both Eisenberg and Fabes (1992) and Harris (1989) offer an account of empathy that is closely aligned to the concept of emotion regulation. Eisenberg and Fabes (1992) propose a close association between empathy and emotion regulation, where emotion regulation is a necessary but not sufficient condition for an empathic response. Conversely, Harris offers an account of empathy that construes an empathic response as serving an inherently regulatory function, providing the child with an alternative to emotional contagion. Harris (1989) argues, "... given that during the second year emotional contagion declines and active efforts to help the other person in distress become more common, one could equally plausibly argue that the tendency to offer comfort competes with emotional contagion and is in no way fuelled by it" (p. 78).

### **1.3.3 Summary**

The current section examined intrinsic child characteristics that are closely aligned with the emotion regulation construct. Both temperament and empathy, to some extent, overlap with the overarching construct of emotion regulation, albeit in different ways, and this conceptual association is mirrored in the overlapping methodologies used to examine these constructs, which is dealt with in Chapter 2.

Children's temperamental characteristics, in particular, structure their emotion experience and management of arousal. In fact, when observing a child's response to a given situation it is not immediately possible to elucidate temperamental influences from the management of emotion regulation. In order to tease apart these overlapping constructs we can study children's responses longitudinally and across different contexts (Kochanska does both, e.g., Kochanska, Aksan, & Joy, 2007; Kochanska & Knaack, 2003; Kochanska, et al., 2000). While temperament refers to children's responses across a broad range of different events, children's empathic responses are more contextually defined. Children's behavioural and affective responses are examined within the empathy framework only when they are vicariously elicited during specific events, typically involving the distress or misfortune of another. Nevertheless, like temperament, an understanding of the child's empathic responses can provide an insight into the child's own abilities to regulate emotional arousal.

In an individual instance of regulation it is exceedingly difficult to tease apart the influence of the child's temperamental characteristics or know for certain whether an empathic response is serving a regulatory function. As such, an examination of the intrinsic influences on children's emotion regulation emphasise the importance of examining the child's complete response to a challenging event. Although there is uncertainty regarding the limits of the emotion regulation construct, research examining children's behavioural and affective responses to challenging events has been fruitful. Examining children's responses to specific challenging events allows for an investigation of the importance of emotion regulation in social contexts. Thus, there has been sustained research on the relation between children's emotion regulation and their adaptive social functioning, and this is the focus of the following section, including where appropriate, the role played by temperament and empathy in this relation.

#### **1.4 Emotion regulation and social adaptation**

Regulation of emotional arousal is an important challenge for developing children on many fronts. In order to function well socially, children must be

emotionally well-regulated (Hubbard & Dearing, 2004; Southam-Gerow & Kendall, 2002). The regulation of emotion is necessary for children to achieve increasing autonomy and independence, and to adapt to a new social environment within and beyond the immediate family, such as school. Despite the inherent problems in the definition of emotion regulation outlined above, research examining the relation between emotion regulation and children's social adaptation has been fruitful. Many studies have explored the socio-emotional correlates of adaptive and maladaptive emotion regulation using a large number of different measurement methods (Cole, Zahn-Waxler, Fox, Usher, & Welsh, 1996; Eisenberg et al., 1993; Eisenberg, Fabes, Guthrie, et al., 1996; Eisenberg et al., 1995; Eisenberg, Fabes, & Murphy, 1995; Eisenberg et al., 2000; Fabes et al., 1999; McDowell, O'Neil, & Parke, 2000; Walcott & Landau, 2004). The different methodologies used to assess children's emotion regulation will be discussed in Chapter 2. In the current chapter, although differential operationalisations of emotion regulation are not directly examined, it is necessary to convey what is conventionally meant by adaptive and maladaptive emotion regulation. Adaptive emotion regulation refers to those regulatory strategies that are appropriate and functional to the situational context, children with adaptive emotion regulation strategies are considered well-regulated. Maladaptive emotion regulation refers to regulatory strategies that are inappropriate or counter-productive to the situational context, children with maladaptive emotion regulation strategies are considered dysregulated or poorly regulated.

Studies investigating the association between emotion regulation and social adaptation have revealed that well-regulated children are more likely to experience positive social relationships, while children with maladaptive emotion regulation strategies tend to have social difficulties and experience problem behaviours (Calkins, Gill, Johnson, & Smith, 1999; Cole, et al., 1996; Cole, Zahn-Waxler, & Smith, 1994; Eisenberg, Valiente, & Eggum, 2010; McDowell, et al., 2000; Rubin, Coplan, Fox, & Calkins, 1995; Walcott & Landau, 2004). Specifically, this research has demonstrated predictable relations between adaptive and maladaptive emotion regulation and children's prosocial behaviours (e.g., Eisenberg, Fabes, Guthrie, &

Reiser, 2000), social skills (e.g., Eisenberg, Fabes, Murphy, et al., 1995; Eisenberg, et al., 1997) and problem behaviours (e.g., Cole, Zahn-Waxler, et al., 1994). In particular, poorly regulated children tend to experience externalising and disruptive disorders (e.g., Cole, Zahn-Waxler, et al., 1994; Eisenberg, Spinrad, et al., 2010; Stifter, Spinrad, & Braungart-Rieker, 1999). Finally, emotion regulation has also been associated with the quality of children's peer relationships (e.g., Calkins, et al., 1999; Graziano, Keane, & Calkins, 2007; Maszk, Eisenberg, & Guthrie, 1999; Spinrad et al., 2006; Wilson, 2003). Indeed, there is a consistent relation between emotion regulation and social adaptation, with those children who are well-regulated more likely to experience positive social relationships, whereas children who are more poorly regulated are likely to display problem behaviours and have difficulties maintaining peer relations.

Eisenberg and her colleagues, in particular, have made a sustained effort to understand how systematic individual differences in children's emotion regulation is related to social adaptation (e.g., Eisenberg, Fabes, et al., 2000; Eisenberg, Fabes, & Murphy, 1995; Eisenberg, et al., 1997; Eisenberg, Guthrie, et al., 2000; Eisenberg, Spinrad, & Smith, 2004; Spinrad, et al., 2006). This extensive research base has enabled Eisenberg and colleagues to differentiate between different styles of emotion regulation and, furthermore, provide a theoretical framework for examining the association between emotion regulation and children's social adaptation (Eisenberg & Fabes, 1992; Eisenberg, Fabes, et al., 2000; Eisenberg, Hofer, et al., 2007). Essentially, Eisenberg and colleagues put forward three different modes of emotion regulation (e.g., Eisenberg, Spinrad, et al., 2010; Eisenberg, et al., 2004). First, highly regulated children are high in effortful control and more likely to intensely experience negative emotions such as fear and anxiety, are prone to internalising disorders and tend to withdraw from social interactions. Second, under-controlled children are poorly regulated and have low levels of effortful control, these children are prone to behavioural problems such as aggression and antisocial peer relationships. Finally, optimally regulated children are relatively high in effortful control, but also flexible in their use of regulatory behavioural strategies in response to emotionally arousing events (Eisenberg, et al., 2004). Optimally regulated children

are expected to be well adjusted, socially competent and resilient. Eisenberg et al.'s empirical findings to some extent support these models of emotion regulation (e.g., Eisenberg, Fabes, et al., 2000; Eisenberg, Fabes, Murphy, et al., 1995; Eisenberg, et al., 1997; Eisenberg, Spinrad, & Morris, 2002; Eisenberg, et al., 2004; Eisenberg, Valiente, et al., 2010; Fabes, et al., 1999; Spinrad, et al., 2006)

In order to explain individual differences in emotion regulation and social adaptation, however, Eisenberg and colleagues draw upon children's temperament. In particular, children's temperament is seen as an important construct when attempting to explain the relation between individual differences in emotion regulation and children's social functioning. The importance of investigating temperamental factors as moderating the relation between emotion regulation and social adaptation has emerged because the relationship between emotion regulation and social adaptation is not simply a linear one; greater regulation of emotional arousal does not appear to necessarily equal improved social functioning within an individual differences perspective.

As outlined in Section 1.3, children's effortful control and emotionality has been the focus of research investigating individual differences in emotion regulation, and this is clearly seen in Eisenberg's conceptualisation of the different modes of emotion regulation outlined above. However, the relation between temperament and emotion regulation has not always been clear. Within some empirical research, temperament measures stand in for emotion regulation measures (e.g., Eisenberg, et al., 1993; Eisenberg, et al., 1997; Fabes, et al., 1999; Gurthrie, et al., 1997), whereas in others children's temperament has been examined as a moderating factor in the relation between emotion regulation and social adaptation (e.g., Eisenberg, Fabes, Guthrie, et al., 1996; Rubin, et al., 1995).

The first temperamental factor that has received much research attention is emotionality. As has been outlined above, children who are more prone to intense, negative emotions must rely on their abilities to regulate emotion to a greater extent than children who experience negative emotions less intensely. Children's regulation of emotional responses is thought to play an important role in tempering the detrimental impact of negative emotionality on social functioning (Eisenberg, et

al., 1997). For example, Eisenberg and colleagues (2000) found that negative emotionality moderated the relation between emotion regulation and social competence, such that adaptive regulation predicted social competence only for children high in negative emotionality (see also Eisenberg, Fabes, Murphy, et al., 1995; Maszk, et al., 1999). Thus, according to Eisenberg, individual differences in children's social competencies vary as a function of both their skills to adaptively regulate their emotional responses and the degree to which they experience negative emotions.

Effortful control also plays an important role in explaining the relation between emotion regulation and social competence. Like emotion regulation, effortful control is closely related to children's social adaptation and problem behaviours, with greater effortful control across both emotionally challenging and non-emotionally challenging situations corresponding to greater social competence and fewer problem behaviours (e.g., Eisenberg, Fabes, Guthrie, et al., 1996; Eisenberg, et al., 1997; Eisenberg, Hofer, et al., 2007; Eisenberg, et al., 2002; Kochanska & Knaack, 2003; Liew, et al., 2004).

A study conducted by Liew, Eisenberg and Reiser (2004) nicely illustrates the complexly determined processes involved in socially appropriate responding. In this study, children able to modulate their expressive reaction to disappointment by spontaneously minimising and controlling their negative responses, were also higher in effortful control and lower in negative emotionality compared to children who struggled to mask their negative reactions. Furthermore, the robust relation between effortful control and children's social competence was mediated by their ability to appropriately manage their behavioural responses to disappointment (e.g., modulating verbal and facial indicators of disappointment). This finding suggests that children's effortful control underpins regulatory behaviours and underscores the complex relation between emotionality and effortful control, and their influences upon children's emotion regulation and social competencies.

In contrast to the examination of temperament as a moderator of the association between children's emotion regulation and social adaptation, empathy has been directly examined in relation to children's social competencies. As would

be expected from the intimate relation between emotion regulation and empathy, both constructs have been closely examined as correlates of children's developing social competencies. Young children's affective empathy responses and empathic understanding have consistently been argued to influence social competence and support altruistic or prosocial behaviour (Eisenberg, 2000b; Eisenberg & Mussen, 1989; Iannotti, 1985; Saarni, 1999; Underwood & Moore, 1982), and there are many indications that children with high levels of empathy engage in more prosocial behaviours to alleviate distress (e.g., Eisenberg, 2000b; Eisenberg & Fabes, 1990, 1995; Fabes, Eisenberg, & Miller, 1990; Miller, Eisenberg, Fabes, & Shell, 1996; Roberts & Strayer, 1996; Strayer, 1989).

As can be seen from the review above, the manner in which young children manage their emotional arousal has broad implications for social functioning. However, to understand individual differences in the relation between emotion regulation and social adaptation it is important to account for the child's temperament, in particular, their emotionality and effortful control. In contrast, the association between empathy and social adaptation tends to be examined directly.

In the final substantive section of the current chapter, an outstanding issue in the emotion regulation literature is examined. While the emotion regulation literature has focused on the temperamental and socialisation aspects that contribute to emotion regulation, and associations between such regulation, empathy and social adaptation, it has for the most part ignored the potential influence of a child's capacity to understand or reflect on emotion as an influence on adaptive emotion regulation. In the following section, the role played by children's developing understanding of mind and emotion for their abilities to adaptively regulate emotional arousal is explored from both a conceptual and empirical standpoint.

### **1.5 Outstanding issues: The role of emotion understanding for emotion regulation**

As noted above, the emotion regulation literature has so far ignored the possible impact of a child's emotion understanding on their abilities to manage arousal. However, the importance of the young child's understanding of their situational context has been highlighted at various points in the discussion above.

First, it was noted in Section 1.2.2 that emotions result from our appraisals and subjective understanding of our relationship to the environment. Second, children's engagement in social referencing demonstrates that the manner in which they understand the situational context, via cues from their caregiver, helps them appropriately manage their emotional response. Finally, in the empathy literature, children's understanding of the unfolding emotional event is considered crucial for well-regulated empathic responses. Thus, it appears that the manner by which children experience and regulate their emotional responses depends to a great extent on their understanding of emotional circumstances, however, the relation between children's emotion understanding and their emotion regulation has not been closely examined in the empirical literature, although it has received some conceptual attention.

Halberstadt, Denham and Dunsmore (2001), with their model of affective social competence, and Saarni (1999), with her broad conceptualisation of emotional competence, stress the importance of the interplay between children's emotion regulation and their emotion understanding when attempting to understand the child's social functioning. *Emotion understanding* refers to knowledge about emotion process, including emotion expression understanding, insights into the emotional perspective of others, and the situational determinants of emotion (de Rosnay, Harris, & Pons, 2008). Halberstadt et al. and Saarni propose that when children encounter an emotionally challenging situation they draw upon their emotion understanding, as well as other resources, to regulate their emotional arousal. This idea is not novel, Vygotsky (1935/1994), for example, discussed how the emotional responses of children at different ages are structured and thereby regulated to a great extent on the basis of their capacity to understand emotional circumstances. Furthermore, Thompson (1994), in his influential paper on emotion regulation, highlights the importance of children's interpretation or appraisal of emotionally arousing experiences for their regulatory efforts (see also Meerum Terwogt & Olthof, 1989). This conceptual relation between children's emotion understanding and regulation must be understood within the context of development. That is, over the course of childhood, children use their emotion understanding differently to

structure and manage their emotional responses to challenging events (see Section 1.2.4).

Despite the theoretical suggestion that there should be a close association between children's emotion understanding and their abilities to appropriately regulate emotional responses, there has been relatively little explicit empirical research investigating the nature of this link (however see Cole, Dennis, Smith-Simon, & Cohen, 2009; Denham et al., 2003; Schultz, Izard, Ackerman, & Youngstrom, 2001). As noted above, an exception to the empirical division between children's understanding of emotion and their regulation of emotion is the social referencing and empathy literatures. Both make the assumption that the manner in which children are able to understand the situational context influences the manner in which they are able to manage their behavioural response. In the social referencing literature, the information children receive from their caregiver helps structure their own subsequent response to the environment (Moses, et al., 2001). In the empathy literature, particularly in Harris' (1989) account of empathy, children's developing emotion understanding allows them to understand the emotional context and appreciate the separation between themselves and the individual in distress, thereby enabling children to respond to an empathy eliciting event in a well-regulated, empathic manner.

Aside from social referencing and empathy research, there tends to be a schism between research that considers children's understanding of emotion and research that considers children's experience and regulation of emotional responses (de Rosnay, Harris, et al., 2008; Harris, 1994). The few studies that have explicitly examined the relation between emotion understanding and emotion regulation have adopted an individual differences perspective and only lend limited support to the conclusion that better emotion understanding corresponds to more adaptive emotion regulation (e.g., Cole, Dennis, et al., 2009; Garner & Power, 1996; Miller et al., 2006). For example, Cole and colleagues (2009) investigated the association between preschoolers explicit understanding of emotion regulation strategies, as an index of their emotion understanding, and their behavioural indicators of adaptive emotion regulation. They found that children able to generate a greater number

potential emotion regulation strategies were more likely to engage in adaptive behavioural strategies when faced with an emotionally challenging situation.

Although Cole et al. (2009) found an association between emotion understanding and emotion regulation, the measure of emotion understanding was narrowly defined and directly related to children's emotion regulation. However, research employing a broader index of emotion understanding has also demonstrated that the manner in which children understand emotion is positively related to their adaptive use of emotion regulation strategies. For example Garner and Power (1996) found a small association between preschoolers abilities to regulate their response to a disappointing gift and their understanding of the situational determinants of emotion. However, other research has failed to find a relation between emotion understanding and regulation (e.g., Arsenio, Cooperman, & Lover, 2000; Denham, et al., 2003). Overall, the extant literature demonstrates inconclusive findings regarding the relation between individual differences in children's emotion understanding and emotion regulation. Thus, while there is a conceptual relation suggesting the importance of emotion understanding for adaptive emotion regulation across development, for an individual child at a given time-point, emotion understanding and emotion regulation appear to be relatively independent.

Although there has been relatively little fruitful research on the nature of the relation between emotion understanding and emotion regulation, both are related in similar ways to social adaptation. As outlined in Section 1.4, children with more adaptive emotion regulation are likely to be more socially competent. Mirroring this relation, emotion understanding has also been associated with children's social adaptation, including higher levels of altruism (Underwood & Moore, 1982), more prosocial behaviour (Dunn & Cutting, 1999; Eisenberg & Mussen, 1989), social skills (Izard et al., 2001; Schultz, et al., 2001), and more competent peer-relations (Cassidy, Werner, Rourke, Zubernis, & Balaraman, 2003; Denham, McKinley, Couchoud, & Holt, 1990; Slaughter, Dennis, & Pritchard, 2002). These findings imply that children able to take the perspective of others and understand the emotional consequences of their behaviour are more likely to respond appropriately in social situations

(Denham, 1998; Saarni, 1999; Underwood & Moore, 1982). Thus, despite a lack of research suggesting a direct relation between children's emotion understanding and emotion regulation, research strongly suggests that both constructs have an influence on adaptive social functioning.

In the few instances that emotion regulation and understanding have been simultaneously considered as predictors of children's social functioning, they appear to exert a relatively independent influence (e.g., Denham, et al., 2003; Arsenio, Cooperman, & Lover, 2000; for an exception see Miller, et al., 2006; Schultz, et al., 2001). For example, Denham et al. (2003) examined relations between children's emotional competence and social competence at preschool and kindergarten. Both emotion regulation and emotion understanding, while unrelated, made simultaneous independent contributions to children's social competence, concurrently at preschool and one year later at kindergarten. Schultz et al. (2001) also investigated the relationship between emotion regulation and emotion understanding. They found that a lack of emotion understanding at kindergarten, measured via emotion expression knowledge, predicted concurrent social problems; this relation remained even after accounting for children's earlier emotion regulation in preschool.

The empirical research suggests that children's emotion regulation and emotion understanding are independent and, moreover, make an independent contribution to social adaptation and functioning by school-age. At first, this conclusion may sit uncomfortably with the conceptual relation between emotion understanding and regulation put forward by Halberstadt et al., (2001), Saarni (1999) and others (Denham, et al., 2003; Vygotsky, 1935/1994). However, as stated above, the conceptual relation focuses on the influence of these important constructs across development, it says nothing about the relation between individual differences in emotion understanding and regulation at a given period in childhood. The empirical literature, on the other hand, has focused exclusively on the relation between individual differences in emotion understanding and regulation in a limited chronological window, and the conclusion from the empirical research is that children's understanding and regulation of emotion are relatively distinct. This

makes sense when examining the independent role played by children's emotion understanding and regulation in social adaptation. The adaptive resolution to an emotionally challenging situation may hinge on children's skills at managing their emotional arousal, whereas the maintenance of ongoing peer relations may rest more heavily on children's emotion understanding, with both processes influencing the child's social functioning, albeit via different routes.

### **1.6 Summary**

In this chapter the challenges surrounding the construct of emotion regulation were examined. In particular, the difficulties in conceptually delineating the experience of emotion from the management of emotional was explored. This chapter also aimed to delineate between emotion regulation and other closely related constructs, including temperament, empathy and emotion understanding. Temperament is often conceived of as both fundamental to emotion regulation as well as a process of emotion regulation itself, whereas, empathy may be understood as a special case of emotion regulation. Finally, while the conceptual literature proposes a strong association between children's abilities to understand emotion and their skills at regulating emotion, there is relatively little evidence to suggest that individual differences in these constructs are associated. In the current thesis, a separation is observed between these four constructs, such that emotion regulation is considered conceptually distinct from temperament, empathy and emotion understanding.

Although there are theoretical difficulties with the construct of emotion regulation, the functional definition put forward by Thompson (1994) has proved useful, and there is a large literature examining the development and correlates of children's emotion regulation. This thesis aims to investigate the impact of children's emotion regulation on their social competence. The literature reviewed in the current chapter provides evidence for this association, those children who are emotionally well-regulated are likely to be socially competent and have positive relationships with their peers. Conversely, children who are poorly emotionally regulated are likely to exhibit problem behaviours.

In the current thesis, the concurrent and longitudinal relations between young children's emotion regulation and their social adaptation are examined at the time of children's school entry, using children's behavioural responses to a structured emotion elicitation paradigm as an index of emotion regulation. In addition, the close conceptual relation between emotion regulation, empathy, and emotion understanding will be empirically examined, with an emphasis on the relation between these different measures of children's emotional competence and their independent and combined impact on social adaptation.

Chapter 1 presented a global conceptual examination of the emotion regulation construct. In the Chapter 2, the methodological approaches to the elicitation and assessment of the processes of emotion regulation are outlined, with a particular emphasis on the methodological overlap between measures of emotion regulation, temperament and empathy. In the first study (Chapter 3), children's behavioural and affective response to an emotionally challenging and empathy inducing vignette will be examined. The second study (Chapters 4 through to 9) expands upon the methodology presented in Study 1 and examines children's behavioural and affective responses under various different conditions (e.g., distress, fear, anger, exclusion). Both Study 1 and 2 examine the relation between children's behavioural responses to challenging events and their social adaptation, both concurrently (Study 1) and longitudinally (Study 2).

## Chapter Two

### The Measurement of Emotion Regulation

#### 2.1 Introduction

In the current chapter, methodological approaches to the measurement of emotion regulation in childhood are examined, with a focus on children's behavioural, affective and physiological responses when faced with an emotional, challenging or evocative situation. In Chapter 1, the conceptual challenges to the emotion regulation construct were examined, with an emphasis on the difficulty in conceptually delineating the experience of an emotion and the regulation of the same emotional experience. This issue is also necessarily a methodological challenge. Indeed, the following discussion on the measurement of emotion regulation makes it clear that there is an overlap between measures of emotion, on the one hand, and measures of the processes of emotion regulation, on the other hand. For example, the physiological processes that are considered indicative of emotion regulation are also those processes that support the generation of emotional responses (Thompson, Lewis, & Calkins, 2008). The confusion between the experience of emotion and its regulation has been emphasised in Chapter 1 and will not be laboured in the current discussion of the methodological approaches to emotion regulation.

Although there are numerous different approaches to the study of emotion regulation, the current chapter examines four measurement methods that are most commonly used in developmental research, these are; (i) the direct observation of behavioural strategies during emotionally evocative and/or challenging events, (ii) physiological measures of emotion regulation, (iii) questionnaire measures of children's emotion regulation, comprising parent and teacher report, and (iv) self-reported emotion regulation strategy understanding. These four methodological approaches will be examined in detail and a discussion of potential issues surrounding the use of these different methods will be provided.

In addition to an outline of the different measurement methods for the assessment of emotion regulation, the current chapter examines the different

methodological approaches to the study of empathy. As outlined in Chapter 1, there is a close conceptual relation between emotion regulation and empathy. Both Eisenberg and Fabes (1992) and Harris (1989), albeit in different ways, propose an intimate relation between children's skills at regulating their emotional arousal and their empathic responses. In addition to a close conceptual relation, there is also a large degree of overlap in the methods used to assess children's emotion regulation and their empathy. Therefore, following discussion of the measurement of emotion regulation, methodological approaches to the study of empathy are also taken up in this chapter. The chapter concludes with a discussion of methodological considerations in the measurement of emotion regulation and empathy, and discusses the approaches adopted in this thesis.

## **2.2 Methodological approaches to the study of emotion regulation**

As discussed in Chapter 1, emotion regulation is a construct without a clear definition, however, the definition put forward by Thompson (1994) is most commonly used when conceptualising emotion regulation in empirical research with children. Thompson states that emotion regulation, "... consists of the [...] processes responsible for monitoring, evaluating, and modifying emotional reactions [...] to accomplish one's goals". The processes articulated in this definition are broad and multifaceted, and involve the organisation, management and integration of physiological, behavioural, expressive and cognitive components (Campos, et al., 1994; Zeman, Cassano, & Perry-Parrish, 2006). Thus, the components of emotion regulation that have attracted psychological research span many different areas, including some that are not necessarily emotion-specific (Thompson, et al., 2008).

With such a broad conceptualisation of emotion regulation within the literature, and because of the obvious and direct importance of emotion regulation for children's social and emotion competence, there has been a proliferation of different methodological approaches and paradigms for assessing emotion regulation in childhood (Bridges, Denham, & Ganiban, 2004; Hessler & Katz, 2007). Approaches to the measurement of emotion regulation include a focus on:

(i) *Attachment organisation*. Attachment theory emphasises the importance of the dyadic relationship between the child and caregiver in shaping the child's emotion regulation (Calkins, 1994; Cassidy, 1994; Sroufe, 1995; Waters, et al., 2010).

(ii) *Genetic factors*. This approach investigates the heritable nature of emotion regulation, with research suggesting that aspects of emotion regulation have a genetic component (e.g., Bell & Deater-Deckard, 2007; Goldsmith, Buss, & Lemery, 1997; Goldsmith, Pollak, & Davidson, 2008; Groot, de Sonnevile, Stins, & Boomsma, 2004; Hariri & Forbes, 2007; Lemery-Chalfant, Doelger, & Goldsmith, 2008).

(iii) *Neural bases of emotion regulation*. This approach has examined the underlying neuro-biology of emotion regulation, typically comprising a focus on the regulatory functions and feedback mechanisms of different brain structures, in addition to the neurochemistry of emotion regulation (e.g., Bell & Deater-Deckard, 2007; LeDoux, 1995; Lewis, 2005; Light et al., 2009; Thompson, et al., 2008).

(iv) *Stress-related hormones*. In particular, cortisol changes in response to stressful stimuli have been examined as an marker of emotion regulation (e.g., Davies, Sturge-Apple, Cicchetti, & Cummings, 2008; Feldman et al., 2009; Katz & Gottman, 1991; Locke, Davidson, Kalin, & Goldsmith, 2009; Scher, Hall, Zaidman-Zait, & Weinberg, 2010; Stansbury & Gunnar, 1994).

(v) *Physiological indices of emotion regulation*. This approach typically assesses changes in heart rate and heart rate variability (during challenging events) as an index of emotion regulation, in addition to changes in skin conductance during emotional events (e.g., Appelhans & Luecken, 2006; Eisenberg, Fabes, Murphy, et al., 1995; El-Sheikh, Ballard, & Cummings, 1994; Fabes, Eisenberg, & Eisenbud, 1993; Fox, Schmidt, Henderson, & Marshall, 2007; Gottman & Katz, 2002; Hessler & Katz, 2007; Porges, 1996, 2011).

(vi) *Observed behavioural regulatory strategies and emotion expressions*. This approach assesses children's observed behavioural and affective responses to challenging emotional events as an index of emotion regulation (e.g., Buss & Goldsmith, 1998; Calkins & Johnson, 1998; Cole, Zahn-Waxler, et al., 1994;

Eisenberg, Fabes, Guthrie, et al., 1996; Gilliom, et al., 2002; Grolnick, Bridges, & Connell, 1996; Gurthrie, et al., 1997; Stifter & Braungart, 1995).

(vii) *Parent and teacher report on emotion regulation*. This approach comprises questionnaire measures to assess typical instances of emotion regulation and expressions of affect across a broad range of contexts (e.g., Eisenberg, et al., 1993; Eisenberg, et al., 1997; Gurthrie, et al., 1997; Rothbart, Ahadi, Hersey, & Fisher, 2001; Rydell, Berlin, & Bohlin, 2003; Shields & Cicchetti, 1997; Spinrad, et al., 2006).

(viii) *Self-reported arousal and emotion regulation strategies*. This approach comprises interview methods to examine self-perceived emotion regulation strategy use, as well as self-reported affective responses to emotionally challenging events (e.g., Cole, Dennis, et al., 2009; Denham, 1998; Harris, 1989; Pons, Harris, & de Rosnay, 2004; Saarni, 1999; Stegge, Meerum Terwogt, Reijntjes, & van Tijen, 2004).

Despite the multiple processes that undoubtedly underlie emotion regulation, emotion regulation is often conceptualised as a uniform skill (Hessler & Katz, 2007). Thus, children who demonstrate well-regulated physiological responses are also expected to be able to better control their behavioural responses and enact adaptive regulatory behavioural strategies. Furthermore, it is often implied that children are equally good at regulating their emotional arousal across different contexts. For example, children who are able to regulate their arousal during peer provocations are expected to be equally capable of regulating their emotional response to frustration. However, an examination of the relation between different measures of emotion regulation, as well as regulation across different contexts is relatively uncommon in the literature. As a result, although there is widespread measurement of children's emotion regulation using multiple different measures, across multiple contexts, there is considerably less research examining the integration of multiple processes and the consistency of these processes across different emotional contexts.

In addition to the complexity inherent in the emotion regulation literature due to the number of processes that may be assessed as an index of emotion regulation, a further methodological challenge is the contextually bound nature of

emotion and regulatory processes. To be well-regulated, children must be able to respond to environmental demands in a flexible manner (Cole, Michel, et al., 1994; Thompson & Calkins, 1996). Thus, in order to validly assess children's emotion regulation, measurement of emotion regulation must take into account the flexible and context specific nature of emotional responding. A basic model of children's experience of emotion that equates specific behavioural responses (e.g., visual avoidance, social support seeking, affective expressions) with adaptive or maladaptive responding is likely to be problematic (Sroufe, 1995; Thompson & Calkins, 1996). Instead, a child's behavioural attempts to cope with an emotionally challenging situation must be viewed within the eliciting situational context, and in terms of the child's needs. For example, in a heated peer conflict, an adaptive response may be an assertive expression of anger, whereas, in a conflict with a teacher at school an expression of anger may no longer be an adaptive response.

Due to age-related differences in children's cognitive, behavioural and physiological capacities, a final challenge for the assessment of children's emotion regulation is the use of paradigms and measures of emotion regulation that are appropriate to the child's developmental level (Zeman, Klimes-Dougan, Cassano, & Adrian, 2007). Thus, different measurement methods are typically used at different ages, making it difficult to make direct comparisons of emotion regulation across different stages of childhood. Research investigating emotion regulation in infancy and early toddlerhood tends to focus on the intensity of emotion expressions and the child's behavioural strategies for the regulation of emotion (e.g., Buss & Goldsmith, 1998; Diener, Mangelsdorf, McHale, & Frosch, 2002; Stifter & Braungart, 1995). Alternatively, the attachment literature has conceptualised emotion regulation within the dyadic context and focuses on the manner in which specific dyads come to more or less satisfactory resolutions of stressful events over time. In preschoolers and school-age children, emotion regulation is most commonly measured using parent or teacher report on children's general observed regulatory behaviours, or by using physiological measures of emotion regulation in emotional or non-emotional situations (e.g., Cole, et al., 1996; Eisenberg, Guthrie, et al., 2000; Graziano, et al., 2007; Underwood, 1997). Such differences in the measurement of

emotion regulation across childhood make the comparison of children's emotion regulation across different developmental periods very difficult, and highlights the necessity of employing multiple methodological approaches to emotion regulation (Zeman, et al., 2007).

Using different methods of assessing emotion regulation may provide some insight into children's emotion regulation across different stages of development, as well as the stability of emotion regulation across multiple contexts. Furthermore, multiple measures of emotion regulation can inform researchers on the reliability of their methods. In this chapter, I attend specifically to four broad measurement methods for assessing emotion regulation that have been particularly prominent in research investigating emotion regulation in early childhood. I will not focus on neuro-biological or hereditary aspects of emotion regulation as these assessments belong in another research area. I will also largely avoid a discussion of the attachment literature as this has been dealt with in Chapter 1 (see also Sroufe, 1995) and a proper treatment of attachment influences requires a very different approach to that adopted in the current thesis. The measurement methods examined in this chapter comprise; (i) the direct observation of behavioural strategies during emotionally evocative and/or challenging events, (ii) physiological measures of emotion regulation, (iii) questionnaire measures of children's emotion regulation, comprising parent and teacher report, and (iv) self-reported emotion regulation strategy understanding.

### **2.2.1 Emotion elicitation: the direct observation of emotion regulation**

The observation of children's behavioural regulation in the face of both emotionally challenging and non-emotionally challenging events is a common method to assess emotion regulation. An important distinction must be made between; (i) the methods used to elicit emotional and regulatory responses in children, and (ii) the behavioural responses themselves. In the current section, the paradigms commonly used to elicit emotional arousal and regulatory behaviours are examined first, followed by a discussion of children's behavioural responses.

**(i) Emotion elicitation: Elicitation paradigms**

In the emotion regulation literature, there are many varied paradigms used to elicit emotional arousal in infants and young children. A useful way to categorise these different paradigms is along two discrete dimensions. The first dimension comprises the manner in which the emotional response is elicited. Children's emotional responses may be elicited *directly*, by placing the child in a real emotional situation, which they are able to modify. For example, children witnessing their mother simulate an injury are able to approach and comfort her, and thus alter the emotion eliciting situation. Alternatively, children's behavioural regulation may also be assessed *vicariously*, whereby the child witnesses an emotional event but is not directly involved, and is unable to alter, or attempt to alter, the outcome. For example, exposure to an emotional vignette, whereby the child observes a story protagonist in emotional distress, elicits an emotional response in the child vicariously. This vicariously induced emotion is especially relevant to children entering a complex social world, as children often witness the emotional response of another without being directly involved. Finally, children's regulatory behaviours may be assessed *indirectly* via parent or teacher questionnaire measures, or child interview techniques. Indirect means of assessing emotion regulation are discussed in Section 2.2.3 and 2.2.4. The second dimension that assists in the categorisation of emotion-eliciting paradigms is the situational content of the paradigm itself (i.e., contextual factors). The content of the paradigm determines the type of emotion that is elicited or is expected to be elicited, the intensity of the emotional response, and the regulatory behaviours enacted to manage the emotion.

Due to a host of developmental differences between infants and school-age children, empirical approaches to the observation and measurement of regulatory behaviours and affective responses in the face of challenging events have proceeded along different lines at these respective ages. Infants and toddlers are most commonly observed in paradigms that involve direct elicitation of an emotional response. Older children, conversely, are more commonly exposed to paradigms that elicit vicarious emotional responses. For example, in infancy, regulatory strategies are typically observed in paradigms that directly provoke anger,

frustration, or fear, such as arm restraint, biscuit removal or exposure to a novel mechanical toy (e.g., Buss & Goldsmith, 1998). Similarly, behavioural responses at these early ages are often assessed directly by examining children's responses during a brief separation from a caregiver, a delay of gratification, or parent-simulated injury (e.g., Gilliom, et al., 2002; Grolnick, et al., 1996; Sroufe, 1995).

By school age, however, it is difficult to construct a paradigm that directly elicits strong emotional responses that necessitate the use of correspondingly strong emotion regulation strategies. As a result, direct measures of older children's emotion regulation are often assessed in situations that place the child under milder levels of emotional stress, such as the disappointing gift paradigm (e.g., Cole, Zahn-Waxler, et al., 1994; Saarni, 1984), or persistence during a difficult or frustrating task (e.g., Eisenberg, et al., 1997; Spinrad, et al., 2006). For example, children may be required to complete a difficult puzzle within a specified time limit to receive a prize, with regulation operationalised as the proportion of time spent attempting to complete the puzzle rather than engaging in an off-task activity or cheating to complete the task more quickly (e.g., Eisenberg, et al., 1997).

In order to elicit regulatory behaviours to challenging emotional events in older children, emotional responses are typically elicited vicariously and often involve exposing children to short emotional vignettes. Given the intimate relation between emotion and the context within which it is elicited (see Chapter 1, Section 1.2.2), the content of the emotionally evocative event is likely to be of crucial significance when evaluating the regulatory strategies evoked. Of equal importance is a consideration of the child's developmental maturity. That is, an emotionally challenging event at a younger age may no longer be challenging when the child is older; thus, it would be expected that the child's use of regulatory strategies would also differ with age, given the exposure to the same event.

Within the emotion regulation literature, the content of the emotion challenging vignettes differs substantially. For example, Cortez and Bugental (1994) exposed children between five and 10 years of age to a mildly upsetting short film of a child's visit to the doctor, an event the children themselves were likely to have experienced or witnessed. By contrast, Eisenberg and colleagues (e.g., Eisenberg,

Fabes, Guthrie, et al., 1996; Gurthrie, et al., 1997) sometimes show school-aged children a vignette about a young girl burnt in a house fire and her subsequent rehabilitation, a challenging, emotional event unlikely to be within typical young children's emotional comprehension and experience. Commonly, however, emotional vignettes often centre on themes that are directly relevant to young children, such as the loss of a family pet, parental and peer conflicts (e.g., Cole, et al., 1996; Cortez & Bugental, 1994; Cummings, Papp, & Kouros, 2009; Eisenberg & Fabes, 1995; Eisenberg, McCreath, & Ahn, 1988; El-Sheikh, et al., 1994), or emotional scenes from children's films, such as Disney's *The Lion King* (e.g., Von Leupoldt et al., 2007). These vignettes can be presented as stories in which real emotions are not typically expressed (Vaish, et al., 2009), videos with real emotional content (e.g., El-Sheikh, et al., 1994; Fabes, et al., 1993), or a blend of the two (e.g., Cole, et al., 1996).

The choice of content for emotionally challenging vignettes is important for the interpretation of the subsequent emotional responses. For example, within the attachment literature, older children are presented with emotional vignettes with attachment themes (e.g., parent-child separations) in order to examine their own *attachment representations* (Bretherton, 1999; Bretherton & Munholland, 1999). In this sense, there is a high degree of context-specificity between the content of the emotionally challenging vignette and the inferences drawn from children's responses to such vignettes. Thus, such research aims to understand how children manage their intimate interpersonal relationships, and they are asked directly about situations that pertain to the hypothesised origins of simple differences in interpersonal relating based on attachment history. When evaluating the relative merits of a child's emotion regulation strategy, a focus on such contextual factors is critical. At the very least, a distinction should be made between emotionally evocative stimuli that are within the comprehension and normal experience of children at a certain age (e.g., a visit to the doctor), and those stimuli which are very confronting and distressing (e.g., a young girl burnt in a house fire). When interpreting children's behavioural responses to these eliciting contexts each context implies expected emotional responses and sets of responses that are more or less

adaptive. In addition, certain eliciting events are also expected to elicit empathic responses in the child.

The vignette approach has been a useful and popular paradigm for studying children's emotional responses and regulatory behaviours. The vignette can be constructed to approximate children's real experiences in the social world. In particular, in the school setting, children often observe the emotional interactions of their peers without being directly involved, or before becoming directly involved by way of participation in the unfolding circumstances. Nonetheless, children must manage their own response to the unfolding event. In this sense, an understanding of children's management of their vicarious emotional responses is likely to be an important step to understanding their social behaviours. Thus, as children get older, the manner in which they manage themselves in the broader context of an unfolding emotional event, particularly one that involves contextually salient themes, as opposed to a specific contrived event in a laboratory setting, may become more relevant.

While emotional vignettes allow a highly controlled examination of children's behavioural responses to commonly experienced emotional events that are difficult to recreate in a laboratory setting, such as peer interactions, there is a significant drawback to this methodology. Paradigms that elicit emotional responses directly may also elicit problem-focused behavioural responses directed to modifying the emotion eliciting event. For example, in a parent-simulated injury paradigm, the child is able to enact strategies that modify the source of the distress, such as comforting the parent. In addition to problem-focused strategies, in paradigms that directly elicit emotional responses children may also enact emotion-focused strategies to reduce distress. For example, in a delay of gratification task, a child may engage in avoidance to reduce frustration (Eisenberg & Fabes, 1992). However, when emotion is elicited by way of a vignette paradigm, children are probably aware that they are unable to alter the source of their emotional distress and, thus, only those strategies that are aimed at reducing affective intensity (e.g., distress) and coping with the emotion are likely to be observed. Nevertheless, given the frequency with which older children are likely to witness an emotionally challenging event, and

experience vicariously elicited arousal, vignette paradigms provide a compelling insight into children's abilities to regulate their arousal.

The discussion so far has focused on the paradigms that are commonly used to elicit emotional responses and regulatory behaviours in children. In the following section, the typical behavioural responses assessed during emotion elicitation paradigms are discussed.

**(ii) Emotion elicitation: Behaviours**

Studies of behavioural responses in infancy, toddlerhood and early childhood, have shown that, beginning in early infancy, children reliably display certain kinds of behaviours when faced with emotionally challenging situations, and some of these behaviours have been hypothesised to assist in regulating emotional arousal (e.g., Diener & Mangelsdorf, 1999; Gilliom, et al., 2002; Grolnick, et al., 1996). In the following section, children's typical behavioural responses to emotionally challenging events are discussed, with a specific focus on; (i) disengagement, (ii) self-soothing behaviours, (iii) communicative bids, (iv) agitative activity, and (v) affective responses. The developmental progression of each response is explored, as well as the relation between a specific behavioural response and children's socially adaptive behaviours. While affective responses are examined in this section, a more detailed treatment of children's affective responses to challenging emotional events is undertaken in the discussion of empathy.

**(i) Disengagement**

The most basic strategies children have to regulate their emotion are behaviours that shift and focus attention to and from the emotionally evocative stimuli. Children's use of attention to modulate arousal in emotionally challenging situations has come to prominence in the literature in recent years (e.g., Cole, et al., 2004; Buss & Goldsmith, 1998; Diener & Mangelsdorf, 1999; Eisenberg, Fabes, et al., 2000; Eisenberg, et al., 2004; Gilliom, et al., 2002; Grolnick, et al., 1996; Kopp, 1989), and the use of attention to regulate emotions is the one behavioural strategy that has been closely examined in school-aged children (e.g., Eisenberg, Fabes, Murphy, et al., 1996).

For at least the first nine months of life, the primary strategy relied upon by infants to modulate their own emotional responses is that of avoidance (Kopp, 1989). By avoiding the arousing stimulus (which is often emotional or emotion eliciting), the infant is able to disengage from the event causing distress, and disengagement provides the infant some control over his/her own sensory experience. During infancy, caregivers also assist the young child to engage and disengage attention, and therefore manage arousal to external stimuli. With increasing age, children increasingly rely on strategic attentional strategies to manage their own emotional reactions (Gottman, Katz, & Hooven, 1997).

The ability to disengage from over-arousing stimuli has been found to impact upon emotional experience throughout infancy and early childhood. For example Johnson et al. (1991) found that four month old infants able to easily disengage attention from attractive stimuli were rated by mothers as more easily soothed and less fearful. Furthermore, Buss and Goldsmith (1998), found that disengagement from a frustration task reduced the level of anger expressed by the infant (see also Stifter & Braungart, 1995). Disengagement is also commonly used by young children; for example, Grolnick et al. (1996) found that disengagement was the most frequently used emotion regulation strategy for toddlers in both a toy delay paradigm and during a brief separation from the parent. Gilliom et al. (2002) also showed that preschool-aged boys who were observed to more often use disengagement during a frustrating task had lower levels of anger. Finally, school-aged children who employed greater disengagement during a distressing video (about a child burnt in a house fire) were rated by their teachers as well-regulated (Gurthrie, et al., 1997). These studies suggest that, from toddlerhood to school-age, children commonly use disengagement as a potential emotion regulation strategy and, at least in certain emotionally challenging contexts, it is effective at modulating arousal.

However, somewhat confusingly, as well as disengaging from emotionally challenging situations, children can also focus their attention to gather information on the cause of their distress. Thus, Eisenberg and colleagues have conceptualised both disengagement and attention focusing more broadly as *attentional control*

(e.g., Eisenberg, Fabes, Guthrie, et al., 1996; Eisenberg, Fabes, et al., 2000; Eisenberg, Fabes, Murphy, et al., 1995; Eisenberg, et al., 1997; Eisenberg, et al., 2004). Similarly, Derryberry and Rothbart (1988) also highlight the importance of attentional control for adaptive emotion regulation in young children. While shifting attention away from arousing stimuli can decrease arousal and negative emotions (e.g., Eisenberg, Fabes, Guthrie, et al., 1996), children's developing cognitive abilities provide the possibility of deliberately focusing attention on the distressing event to allow for a better understanding of the source of distress, in order to lessen arousal, for example, via understanding and mastery (Gilliom, et al., 2002). Thus, the literature on children's behavioural responses to emotional events has also examined attention focusing as an index of emotion regulation (e.g., Eisenberg, Fabes, et al., 2000; Eisenberg, Fabes, Murphy, et al., 1995; Eisenberg, et al., 1997; Eisenberg, et al., 2004).

Indeed, both disengagement and attention focusing have been associated with adaptive emotion regulation and socially competent behaviours in different contexts. The key to understanding the role of attentional control for emotion regulation is to have a clear understanding of the eliciting context, and conceptualise disengagement as a dynamic process. The extent to which a child disengages from arousing stimuli, when viewed in this manner, can be understood as a balance between a need for the immediate regulation or attenuation of excess arousal, and the need to comprehend the event causing distress (Cortez & Bugental, 1994). Within this functional framework, the capacity to disengage and marshal attention should be understood in the context of the child's successful or less successful self-management in the service of specific goals.

In keeping with such an approach, there is research demonstrating the positive regulatory effects of both disengagement and attention focusing on a child's social behaviour (e.g., Calkins, et al., 1999; Cortez & Bugental, 1994; Eisenberg, Fabes, Guthrie, et al., 1996; Gurthrie, et al., 1997; Raver, Blackburn, Bancroft, & Torp, 1999). For example, Gilliom et al. (2002) found a relation between toddlers use of disengagement from a frustration task and their social behaviour at 6 years of age, such that earlier reliance on attention shifting strategies predicted lower levels

of externalising problems and greater social skills. Similarly, in school-aged children, Eisenberg and colleagues (1996) found that children who showed greater disengagement during a distressing film (about a girl burnt in a house fire) were rated by their teachers and parents as having fewer problem behaviours. In contrast to these findings, a study by Cortez and Bugental (1994) showed that children between the ages of 5 and 10 who were more attentive during mildly upsetting short film, depicting a child's visit to the doctor, were also more socially competent. These contrasting studies highlight the contextually-bound nature of behavioural strategies, and support the assertion that a distinction should be made between emotionally evocative stimuli that are within the comprehension and normal experience of children, and those stimuli that are likely to be very confronting and distressing. Disengagement from excessively distressing events may indicate good emotion regulation and be correlated with social competence, while disengagement from more commonly experienced, milder emotional events may indicate immaturity or an inability to adaptively cope with a situation that should be within typical childhood experiences (i.e., poor emotion regulation).

As outlined in Chapter 1 (Section 1.3), there is a close association between children's temperament and their ability to regulate emotional responses. Thus, children's disengagement and its relation to adaptive emotion regulation has also been explored through the temperamental construct of *effortful control* (Eisenberg, Hofer, et al., 2007; Rothbart & Sheese, 2007). The development of effortful control emerges towards the end of the child's first year, and coincides with the development of attentional mechanisms, involving both attention focusing and attention shifting (Eisenberg, Hofer, et al., 2007; Kochanska, et al., 2000). The relation between children's modulation of attention and their effortful control has been demonstrated by Kochanska and colleagues (2000), who found that infants' abilities to focus attention at nine months of age were moderately related to individual differences in effortful control at 22 months of age. Similarly, Sethi, Mischel and colleagues (2000) found that toddlers who were observed to use distraction strategies during a separation from their mother also had greater effortful control, as measured in a delay of gratification paradigm, at 5 years of age.

Thus, an apparent contradiction emerges; the literature on children's effortful control suggests that children's ability to both focus attention and disengage from challenging events are positively related to children's effortful control. Again, however, a focus on context helps resolve this apparent inconsistency, in some situations it is more appropriate for children to focus attention, such as during a Stroop-like task requiring effortful attention, whereas in other tasks assessing effortful control, (e.g., a gift delay task) disengagement is a more appropriate response (e.g., Kochanska, et al., 2000).

Like disengagement, children's effortful control has been related to the development of prosocial and problem behaviours. In particular, Eisenberg's extensive research program has demonstrated that children who show greater effortful control are better able to regulate their affective responses, have fewer problem behaviours, and are more prosocial (e.g., Eisenberg, Fabes, Guthrie, et al., 1996; Eisenberg, et al., 1997; Eisenberg, Hofer, et al., 2007; Eisenberg, et al., 2002; Liew, et al., 2004). Kochanska and colleagues (2003) also demonstrated that children with higher effortful control between 22 and 45 months of age had fewer externalising behavioural problems as rated by mothers. Given the important role played by attentional mechanisms in the development of effortful control, and the relation between effortful control and social behaviours, it is likely that effortful control underpins children's use of disengagement in the face of challenging situations (Eisenberg, Hofer, et al., 2007).

### **(ii) *Self-soothing behaviours***

Self-soothing behaviours, such as thumb sucking, and other repetitive movements, are most commonly seen in young children. A study of five and 10 month old infants found that self-soothing behaviours were frequently used during frustration inducing events and typically coincided with a decrease in arousal (Stifter & Braungart, 1995). In toddlerhood, children exhibiting greater distress to parental separation and gift delay also engaged in more self-soothing behaviours (Grolnick, et al., 1996). However, research with infants and toddlers also strongly suggests that the incidence of self-soothing behaviours as a strategy for regulation of arousal decreases markedly with age. For example, in a study by Rothbart et al. (1992), oral

self-soothing was found to peak at three months and decrease until 13.5 months. Notwithstanding this trend, Grolnick et al. (1996) have demonstrated that self-soothing behaviours, although infrequent, were still observed at 24 months in situations involving delay of gratification. Whether these behaviours are still indicative of self-regulatory processes is not clear at these later ages. At 36 months of age, Gilliom et al. (2002) observed self-soothing but failed to show any relation between such behaviours and children's negative emotion expression. Such findings suggest that the decrease in the use of self-soothing with development may be age appropriate as, by preschool age, self-soothing does not appear to be an effective strategy to reduce arousal.

**(iii) *Communicative Bids***

Another means by which children regulate arousal in the face of distress is through communicative bids, typically directed toward the caregiver, in order to seek information about the event causing distress or provide reassurance. Although there is still contention over the age at which infants begin to demonstrate deliberate information gathering and genuine social referencing (see Baldwin & Moses, 1996), various studies have shown that, by 9 months of age, the emotional expression of the caregiver in an ambiguous situation can serve to soothe an infant's emotional distress, as well as guide and regulate subsequent behaviour and social interactions (for a review see Izard & Harris, 1995). By 12 months of age, the infant is able to take an active role in the modulation of their emotions by engaging in co-regulatory behaviours with the caregiver (Feinman & Lewis, 1983; Sroufe, 1995). As outlined in Chapter 1 (Section 1.2.4), Kopp (1989) and others (e.g., Sroufe, 1995) argue that young children's regulatory skills are founded on these early social interactions; infants learning from and with their caregivers how to adaptively regulate their own emotional responses. Between the ages of three and four, by using their caregivers, children seek to understand emotionally distressing situations (Denham, 1998; Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Saarni, 1999). In this way, children actively make sense of the emotion eliciting event and act in ways that enrich such understanding and the potential for the management of their emotion responses.

In a study of the role of communicative bids in the regulatory process, Buss and Goldsmith (1998) found that at 12 and 18 months of age, looks toward the mother and experimenter served a regulatory function, decreasing expressions of anger during frustrations episodes. In a study with toddlers in fear and frustration inducing situations, Diener and Mangelsdorf (1999) also found that children's attempts to engage the mother for emotional support, such as fussing to the mother or social referencing, resulted in a reduction of overt distress. These studies suggest that young children's bids for communication serve a regulatory function in early childhood. However, considerably less research has been done on the use of communicative bids in the behavioural repertoire of school-aged children.

The association between communicative bids and social competencies have been also investigated. For example, Gilliom et al. (2002) found that children demonstrating information seeking behaviour at 42 months during a frustration task were rated by teachers as more social skilled at six years of age. Examining the relation between communicative bids and peer relations, Calkins et al. (1999) found that toddlers orienting towards mother during a frustration task demonstrated greater cooperative social play with a peer, while low levels of mother-orientation was predictive of conflict during a peer-play session. However, the relation between older school-aged children's communicative bids and their social competence has not been examined. Rather, the literature has focused on emotion coaching and emotional discourse in older children (Denham, 1998; Gottman, Katz, & Hooven, 1996; Gottman, et al., 1997).

**(iv) Agitative activity**

In a study of toddlers' behavioural responses to various challenging situations, Diener and Mangelsdorf (1999) found that children's agitative activity was significantly more frequent in a frustration (e.g., delay of gratification task) episode compared to a fear episode (e.g., exposure to a novel, unpredictable toy). Agitative activity comprised tension release behaviours such as high-intensity motor behaviour, such as waving arms or stomping feet. Furthermore, Diener and Mangelsdorf found that children's agitative activity was associated with a decrease in negative emotion expressions, as would be expected if the behaviour served to

regulate or attenuate negative emotion. Studies of older children rarely examine this possible behavioural response to emotionally distressing events. However, it is most likely that, with increasing age, the incidence of overt agitative behaviours would decrease.

More nuanced measures of children's agitative behaviours are measured in older children. Eisenberg and colleagues (1988; 1996) have coded children's 'non-functional' nervous mouth and chin movements, such as tightening or biting of the lips (i.e., grimacing), conceptualising these behaviours as indicative of children's personal distress. Children's ability to inhibit agitative activity has also been examined as an index of regulation (Eisenberg, et al., 2001; Eisenberg et al., 2007). Children, between five and eight years of age, who were able to remain relatively still while waiting for a task to start, were conceptualised as better regulated and were less likely to be rated by parents and teachers as having behavioural problems. Conversely, children unable to inhibit their agitative activity were rated as having externalising problems (Eisenberg, et al., 2001). More broadly, preschool children's teacher reported activity levels in the classroom was positively related to disruptive peer play and negatively related with positive interactive play (Mendez, Fantuzzo, & Cicchetti, 2002). These findings suggest a modest relation between children's abilities to appropriately manage motor activity and their social adaptation.

#### **(v) Affective responses**

In addition to an examination of the behavioural strategies employed by children to regulate their response to emotional events, expressed affect has also been conceptualised as a measure of the child's ability to regulate their emotion. A child's expressed affect has been used in two broad ways to infer regulatory process. First, the increase or decrease in the intensity of an emotion expression is commonly used to infer the *effectiveness* of behavioural regulation strategies. If a behavioural response results in a decrease in the intensity of expressed affect, it is taken as support for the successful regulatory function of the behavioural strategy (e.g., Buss & Goldsmith, 1998; Diener & Mangelsdorf, 1999; Stifter & Braungart, 1995). For example, Buss and Goldsmith (1998), in a study designed to specifically show the impact of regulatory behaviours on expressed emotion, exposed infants to a

frustration task designed to elicit anger. They found that disengagement from the frustrating stimuli reduced the level of anger expressed by the infant and, thus, inferred that disengagement served a regulatory function in this context. A consequence of examining affect as an indicator of the efficacy of emotion regulation is that excess negative emotion is necessarily taken to indicate poor emotion regulation.

Second, in addition to the intensity of an affective response, the specific affect expressed has also been used as an indicator of emotion regulation, although this method is less common in the literature. Expressions of concern, in particular, are sometimes conceptualised as indicating regulation, as this expression is thought to be suggestive of the child's attempts to inhibit negative reactivity (Cole, et al., 1996), although this is, of course, a speculation that has to be validated by the correspondence between the specific affect (i.e., concern) and other behavioural or reported response patterns in the child. For example, Cole et al. (1996) categorised a sample of preschool children with behavioural problems based on their expressions of concern or negative affect (an expression of sadness, fear or anger), to a series of negatively valenced emotionally evocative vignettes. They found that preschoolers expressing predominantly concern compared to negative affect during a series of emotional vignettes were likely to be rated as emotionally well-regulated, and had lower levels of problem behaviours.

Thus, children's affective responses to challenging events have been examined in the emotion regulation literature in two distinct ways, either the intensity of the affective response is used to infer the effectiveness of a behavioural strategy or the specific affect is considered indicative of regulated responding. However, the examination of specific affective responses in the face of an emotional challenge is also a common method for assessing children's empathic responses and is discussed in more detail in Section 2.3.

The extent to which children are able to regulate their emotional expressions has also received attention in research looking at children's understanding of display rules. Display rules are a set of cultural conventions that govern when and how emotion-related behaviour can be expressed (Liew, et al., 2004). Children's display

rule understanding has most typically been investigated using a disappointing gift paradigm, whereby children are required to mask or regulate their expression of disappointment after receiving an undesirable gift (e.g., Saarni, 1984). Research looking at children's abilities to appropriately use display rules in a disappointing situation can be seen as providing a window on their regulatory capacities, albeit in a narrowly defined context (Zeman, et al., 2006). The use of the disappointing gift paradigm in emotion regulation research has recently been acknowledged with several studies employing the paradigm as a means to assess children's regulatory abilities (e.g., Liebermann, Giesbrecht, & Muller, 2007; Simonds, Kieras, Rueda, & Rothbart, 2007). As expected from the regulation literature, it has generally been found that children better able to mask their negative responses to a disappointing gift also demonstrate greater social competence (Garner & Power, 1996).

The use of the disappointing gift paradigm as a measure of children's ability to modulate their emotional responses, however, must be interpreted with some caution. For example, Simonds et al. (2007) operationalise regulation solely as the extent to which children smile during the administration of the disappointing gift paradigm. Clearly there are additional processes at work during emotion regulation over and above the ability to perform a social smile. Therefore, although the use of the disappointing gift paradigm undoubtedly provides a window onto the child's emotion regulation, it is necessary to substantiate the findings with alternate measures of regulation, such as informant measures or physiological indices to provide a more global assessment of the child's regulatory skills. In addition to these concerns, studies looking at the relation between regulation (as measured via the disappointing gift paradigm alone) and effortful control have failed to find predicted relationships in older children (between seven and 10 years of age Simonds, et al., 2007). Thus, it is important to consider the possibility that the strength of the relationship between emotion regulation and a child's ability to conform to cultural display rules may change with maturity.

As can be seen, there is a complex literature examining children's behavioural responses to emotional events both elicited directly and vicariously. In

the following section, children's physiological responses to emotional challenges are discussed.

### **2.2.2 Physiological measures of emotion regulation**

Children's emotional regulation has sometimes been measured using physiological markers; both as a direct marker of regulation (or regulatory ability) and as a validation of behavioural measures. In order to assess children's physiological indices of emotion regulation, emotional arousal is elicited using the same paradigms as outline above in Section 2.2.1. When emotion regulation is operationalised in terms of physiological processes, children's physiological reactivity, such as changes in heart rate or heart rate recovery after an emotional event, have been assessed (e.g., Gottman & Katz, 2002; Hessler & Katz, 2007). In addition to these measures, an increasingly relevant physiological marker of emotion regulation is vagal tone (Porges, 2001, 2011). Vagal tone indexes parasympathetic influences on the heart that occur via the vagus nerve, and is considered a measure of physiological regulation because it captures the individual's ability to respond to the environment in a flexible and adaptive manner (Appelhans & Luecken, 2006; Porges, 1996, 2001). The vagal nerve acts as a 'brake' to modulate heart rate, either by decreasing the inhibitory vagal control of the heart to increase heart rate or by increasing inhibitory vagal control to slow heart rate down (Porges, 2001). Vagal tone has direct implications for emotion regulation. By modulating heart rate the 'vagal brake' allows quick engagement and disengage from the environment to support self-soothing behaviours and readiness to act (Porges, Doussard-Roosevelt, & Maiti, 1994).

Vagal tone is a commonly used index of heart rate variability, which refers to the degree to which heart rate changes to meet situational demands, and has been related to individual differences in attention, cognition and emotion in children and adults (Appelhans & Luecken, 2006; Fox, et al., 2007; Lopes & White, 2006). A high variability in heart rate implies well functioning autonomic control mechanisms, and is considered indicative of good regulation (Pumprla, Howorka, Groves, Chester, & Nolan, 2002). Conversely, lower variability in heart rate is suggestive of less flexible and maladaptive regulation. Heart rate variability as an index of emotion regulation

has been assessed during emotionally challenging events, as well as during non-emotional, non-stressful (resting) events, and various studies have shown that individual differences in heart rate variability during both states reliably differentiate between children's emotion regulation capabilities (Appelhans & Luecken, 2006; Gilissen, Koolstra, van Ijzendoorn, Bakermans-Kranenburg, & van der Veer, 2007; Liew, et al., 2003; Stifter, Fox, & Porges, 1989).

High variability in heart rate during an emotionally challenging event has been related to greater regulation (e.g., Porges, 1996). For example, Gottman and Katz (2002) looked specifically at how children regulated their arousal during stressful parental interactions, focusing on the physiological markers of regulation. They found that children between four and five years of age who showed greater heart rate variability during a challenging parent-child interaction task were better able to recover and control their heart rate after the interaction had ended. Furthermore, children with greater heart rate variability have been rated by their parents four years later as being more emotionally well-regulated (Gottman & Katz, 2002). Similarly, higher heart rate variability during baseline conditions has been found to reflect a greater capacity for regulated responding in school-aged children (e.g., Eisenberg, Fabes, Murphy, et al., 1995; Fabes, et al., 1993). Conversely, low heart rate variability has been related to maladaptive regulation. For example, in a study by Santucci et al (2008), lower heart rate variability during a recovery phase from a frustrating event was associated with maladaptive behavioural regulation strategies during a frustration paradigm.

Physiological measures of regulation are also associated with children's social adaptation and behavioural problems. Individual differences in the child's physiological response to emotionally evocative events have been shown to correspond to differences in social functioning (e.g., El-Sheikh, Harger, & Whitson, 2001; Ortiz & Raine, 2004; Zahn-Waxler, Cole, Welsh, & Fox, 1995). Generally, children with greater heart rate variability are more socially well adjusted, while those with lower heart rate variability are more likely to experience problem behaviours (e.g., Calkins & Dedmon, 2000; Calkins & Keane, 2004; Hastings, et al., 2000). For example, Graziano et al. (2007) found that children in their first year of

school with greater heart rate variability were, concurrently, more likely to have greater social skills, and were well liked by their peers; although this relation was modest. Furthermore, there was no relation between children's heart rate variability and problem behaviours. However, a study by Cole et al. (1996) found that preschoolers with low heart rate variability during a baseline condition were both facially inexpressive during emotional events and had a high rate of behavioural problems. However, somewhat surprisingly given the findings of Graziano et al. (2007), Cole et al. (1996) found that children with high levels of heart rate variability not only expressed high levels of sadness during emotionally challenging events but also were more likely to have behavioural problems. It was the children with a moderate level of heart rate variability, and expressions of concern during emotional events that were the most socially competent within a sample predominantly composed of children with behavioural problems.

As can be seen, while there is growing evidence for the relation between children's physiological responding and their adaptive regulation and social functioning, findings do tend to be mixed (e.g., Blair & Peters, 2003; Cole, et al., 1996). Many inconsistencies in the literature may be the result of different measurement techniques to assess heart rate variability, as well as different methodological procedures and samples. For example, given the situational specificity of emotion elicitation and regulation, different means to elicit emotion regulation may result in a different pattern of findings for the relation between heart rate variability and social adaptation. In particular, vagal tone assessed during resting states compared to during events that elicit arousal are likely reflect different aspects of regulatory functioning (Liew et al., 2011). While heart rate variability during both baseline and emotional challenges have been found to reflect regulatory processes, they may not be directly comparable. Vagal tone during resting states is indicative of temperamental reactivity and information processing, while vagal tone during emotionally evocative events is conceptualised as 'releasing the vagal brake', so that the individual is ready to attend and respond to environmental challenges (Porges, et al., 1994). The different methodological approaches to the assessment of

children's heart rate variability make elucidating the relation between physiological responding, emotion regulation and social adaptation more challenging.

### **2.2.3 Questionnaire measures of emotion regulation**

A widely used approach for assessing children's emotion regulation is through reports given by others who are familiar with the child. Asking adults to report on children's emotional behaviour and regulation has its benefits because teachers and parents have had the opportunity to observe the children closely in a number of varied social and emotional settings, typically over a long period of time (Underwood, 1997). Teachers, in particular, are able to report on children's abilities to regulate emotional arousal in a structured (school) setting, as well as report, to some extent, on children's regulatory skills in their peer interactions. There are two types of emotion regulation questionnaire, those that assess children's broad emotion regulation skills and those that assess one aspect of children's behaviour hypothesised to be especially important for emotion regulation.

Parent and teacher questionnaires, such as the Emotion Regulation Checklist (ERC, Shields & Cicchetti, 1997), aim to assess parental perceptions of their child's emotion regulation abilities more generally, as well as the child's negative emotion expressiveness (see also Rydell, et al., 2003). For example, items from the ERC include, *can recover quickly from upset or distress*, and *is able to delay gratification*. As can be seen from these items, parents and teachers are asked to report on children's management of their behavioural responses to both emotionally challenging and non-emotional events in a way that is typical or normative with little contextual setting.

In addition to these broad parent and teacher questionnaire measures of emotion regulation, both parent and teacher reports on specific aspects of children's regulation have been employed as measures of more general emotion regulation. In particular, aspects of children's temperament, generally effortful control, are assessed and considered indicative of emotion regulation per se. As has been outlined in Chapter 1 (Section 1.3), effortful control has been closely examined as foundational to adaptive emotion regulation, thus other-informant measures

assessing children's effortful control often serve as a proxy for an assessment of children's emotion regulation.

Effortful control involves processes of focusing and shifting attention, as well as inhibitory control; the ability to activate or inhibit behaviour as needed (Derryberry & Rothbart, 1988; Rothbart & Sheese, 2007). Thus, subscales from the Child Behaviour Checklist (Rothbart, et al., 2001) assessing children's attention shifting, attention focusing, and inhibitory control have been used to assess emotion regulation (e.g., Eisenberg, et al., 1993; Eisenberg, et al., 1997; Gurthrie, et al., 1997; Spinrad, et al., 2006). These questions are more contextually grounded compared to the broad assessment of children's emotion regulation outlined above. For example, the Child Behaviour Checklist include items such as *can easily leave off working on a project if asked*, from the attentional shifting subscale, *when drawing or colouring in a book, shows strong concentration*, from the attention focusing subscale, and finally *can lower his/her voice when asked to do so*, from the inhibitory control subscale. Typically, attention shifting and attention focusing are moderately correlated and are combined into a single attentional control measure (e.g., Gurthrie, et al., 1997).

There is modest evidence that teacher and parent reports of children's emotion regulation are related to other measures of children's regulation (Rydell, et al., 2003; Shields & Cicchetti, 1997). For example, Guthrie et al. (1997) found that parent and teacher reports of attentional control were modestly related to changes in children's heart rate from a resting state to an emotionally challenging event. The fact that these relations are so modest may be due to measurement issues, or they may be because parent and teacher reports of emotion regulation assess a different feature of children's emotion regulation compared to observational or physiological indices.

There is also research to suggest a modest relation between parent and teacher rating of emotion regulation and children's social adaptation and problem behaviours, such as externalising and internalising disorders (Eisenberg, et al., 2001; Spinrad, et al., 2006). Eisenberg and colleagues (1993), for example, found a relation between parent and teacher ratings of effortful control and children's social skills and social status, for boys only. However, close inspection of the data showed that

teacher rated but not mother rated attentional control was related to children's social functioning at school. This finding suggests that a context specific relation may exist between children's emotion regulation and social adaptation. Multiple measures of children's emotion regulation may clarify this relation in future.

Although parents and teachers have an important perspective on children's behaviours, there are some potentially problematic issues with using parent and teacher questionnaire measures of emotion regulation. The first concerns the overlap between parent and teacher report of emotion regulation and measures of children's social behaviours and empathic responding. For example, the ERC includes an item assessing the child's empathy, as an index of emotion regulation, *Is empathic towards others; shows concern when others are upset or distressed*. This is especially problematic for research examining emotion regulation as an antecedent factor or correlate of children's social adaptation and empathy (Rydell, et al., 2003). The problem of overlap is particularly acute when children's social adaptation and empathy measures are based on teacher report as well.

A second problem with questionnaire measures of children's emotion regulation is that they typically comprise questions that assess regulatory behaviour in general, rather than the regulation of emotion in emotionally eliciting contexts. This is problematic as children's abilities to regulate behaviour in general may not necessarily be related to their ability to regulate arousal in emotionally challenging situation. That is, the child's ability to appropriately disengaging during a classroom activity may not be related to his or her ability to appropriately disengage during an emotionally challenging event. In fact, Guthrie et al. (1997) only found a modest relation between parent and teacher questionnaire measures of children's attentional control and children's actual gaze aversions during an emotionally distressing event. The empirical relation between children's behavioural regulation in general and their behavioural regulation in specific emotional settings is an area that needs further research. Although, parent and teacher report measures of emotion regulation are useful in providing an insight into children's emotional regulation, they should probably be used in conjunction with other measures of

emotion regulation that specifically assess regulatory capacities during emotionally challenging events.

Many studies that use questionnaire measures of children's emotion regulation do so using both teacher and parent report, using identical questionnaires. Obtaining multiple informants on children's emotion regulation provides a window into children's emotion regulation across several different contexts. However, teacher and parent report of children's emotion regulation are not often concordant. Problematically, temperament ratings in general, and ratings of attentional control specifically, are sometimes found to be uncorrelated across parent and teacher reports (Eisenberg, et al., 1993; Goldsmith, Rieser-Danner, & Briggs, 1991). While it is conceivable, and in some cases likely, that children may be emotionally well-regulated at school but poorly regulated at home, it poses a difficult issue for researchers attempting to assess children's emotion regulation.

#### **2.2.4 Self report measures of emotion regulation strategies**

Children are also able to report on their use of emotion regulation strategies and their understanding of adaptive and maladaptive strategies. Children's explicit awareness of emotion regulation strategies emerges between three and five years of age (e.g., Cole, Dennis, et al., 2009; Denham, 1998; Pons, et al., 2004). Studies examining children's understanding of emotion regulation strategies have emphasised the development from situational and behavioural regulation strategies to a preference for cognitive or mental strategies to regulate arousal (Harris, 1989; Saarni, 1999; Stegge, et al., 2004).

Reporting on emotion regulation strategies requires children's to have an increasingly objective understanding of emotion, in addition to a capacity to express this understanding verbally. As a result, self-report measures of children's emotion regulation strategy understanding have shifted the emphasis away from children's experience and management of emotion to their *emotion regulation understanding*, an aspect of cognitive development centring on the understanding of mind and emotion. While there is some evidence of an association between children's emotion regulation strategy knowledge and their use of adaptive regulation strategies (Cole, Dennis, et al., 2009), clearly, children's objective understanding of

emotion regulation strategies is distinct from their ability to use these strategies adaptively in the face of an emotional challenge. For example, a study by Underwood et al. (1992) found that both aggressive children, who were reported to express anger frequently and fight with their peers, and non-aggressive children, were equally likely to nominate regulation strategies for masking their anger.

### **2.2.5 Summary**

Thus far, I have discussed various methodological approaches to the measurement and study of children's emotion regulation. Children's emotion regulation may be conceptualised in a large number of different ways, including behavioural, affective and physiological responses to emotional and challenging situations. Furthermore, the measurement of temperamental factors such as effortful control and emotionality often serve as a proxy for the assessment of children's emotion regulation. Finally, children's self-reported use of emotion regulation strategies are also sometimes used as an index of adaptive or maladaptive emotion regulation.

The large and diverse range of different methodological approaches to the study of children's emotion regulation does pose a number of challenges. First, there is still uncertainty surrounding the concordance between different measurement methods of emotion regulation. Second, the contextually bound nature of emotion processes makes it difficult to compare emotion regulation across studies that use different emotion eliciting paradigms. Finally, age-related differences in children's emotional and cognitive skills have necessarily resulted in the use of different measurement methods across the childhood, again making it difficult to compare children's emotion regulation at different developmental periods. Nevertheless, despite these challenges, the emotion regulation literature has been productive, with much research investigating the antecedents and correlates of adaptive and maladaptive emotion regulation, individual differences in children's emotion regulation, and those extrinsic and intrinsic factors that moderate the relation between emotion regulation and social functioning. Despite both methodological and conceptual confusion, these domains of children's behaviour are clearly of relevance for their well-being.

In the section above, I focused on emotion elicitation paradigms and children's behavioural, affective and physiological responses to these emotionally challenging situations. However, oftentimes the emotion elicitation situation is not only emotionally challenging, but also empathy inducing. For example, situations such as simulated parental distress, or a video vignette depicting a protagonist experiencing distress or sadness, may provoke both regulatory behaviours and empathic responses in the child. It is therefore unsurprising, especially in light of the close conceptual relation between emotion regulation and empathy outlined in Chapter 1, that paradigms used to elicit regulatory behaviours have also been used to investigate children's empathic responses. However, as noted in Chapter 1, empathy also involves some understanding of the emotional plight of another and, as such, approaches to the assessment of children's empathy may also comprise a distinct cognitive component. In the following section, I examine the methodological approaches to the assessment of empathic responses in children.

### **2.3 The measurement of empathy**

Like emotion regulation, the measurement of empathy centres on children's responses to emotionally challenging events. As a result, there is a high degree of conceptual and methodological overlap between measures of both. In particular, when empathy measures are assessed directly based on the child's response to another in distress, they rely heavily on paradigms that are also used to assess emotion regulation. Thus, specific behavioural, affective and physiological responses to emotionally challenging events potentially elicit both the child's emotion regulation, as well as their empathic orientation.

Empathy research emerged out of studies exploring the motivation behind altruistic and prosocial behaviours, with both philosophers and psychologists proposing that individuals who felt empathy in a particular instance, or had a more general empathic disposition, were likely to perform altruistic or prosocial acts (Eisenberg & Mussen, 1989; Hoffman, 1982; Iannotti, 1985). However, despite the longstanding conceptual association between empathic responding and altruistic or prosocial behaviours, a meta-analysis by Underwood and Moore (1982) exploring

the relation between empathy and prosocial behaviours failed to demonstrate a substantial link. Further reviews by Eisenberg and Miller (1987) and Miller and Eisenberg (1988) found that the manner in which empathy was assessed was an important factor in the degree to which empathy was related to prosocial behaviours, as well as inversely related to aggressive and antisocial behaviours. Empathy tended to be more closely associated with prosocial, sympathetic behaviours in tasks where children had a higher degree of emotional involvement. Thus, the methodological approach to the assessment of empathy is an important consideration when examining the relation between empathy and children's social adaptation. The following section outlines the different approaches to the study of empathy in childhood, as well as the relation between these different measures.

As has been outlined in Chapter 1, empathic arousal has both an affective and cognitive component. The affective component includes the emotional arousal experienced when observing another's plight, while the cognitive component provides the observer an awareness that the distress experienced by the victim is separate from the distress they feel when observing the victim (Hoffman, 1984). Due to these distinct conceptualisations of empathy, the measurement of children's empathic responses has also proceeded along different lines. First, children's *affective empathy* may be assessed, and comprises of much the same measurement methods as those assessing children's emotion regulation. Affective empathy measures include observational measures of facial affect, self-reported affect, as well as physiological responding whilst witnessing an emotionally evocative scenario. Second, children can be presented with empathy eliciting stories and asked how they feel, why they feel that way, and what they would do (e.g., Roberts & Strayer, 1996); such approaches involve perspective taking skills and are sometimes described as *cognitive empathy*.

Both affective and cognitive measures of empathy are relatively direct assessments of a child's empathic responding, and assess the child's empathic responses to a real or simulated emotional event. However, empathy may also be measured indirectly. Children's behavioural response to another in distress, such as helping and caring behaviours, are often taken as an indication of the child's

underlying empathic feelings and in this case there has not be such a sharp distinction between affective and cognitive empathy (e.g., Zahn-Waxler, et al., 1995). Finally, empathy is often measured indirectly via parent and teacher questionnaires assessing dispositional empathic tendencies. These different conceptualisations of empathy and different approaches to measurement will be discussed in turn below.

### **2.3.1 Affective empathy**

When empathy is measured directly, empathic responses must be elicited. The methods used to elicit children's affective empathy share much with the emotion regulation literature that has been discussed above. In fact, observational measures of empathic responding often rely on the same paradigms used to assess children's emotion regulation. In the following section, I examine the different methodological approaches to the assessment of affective empathy, including; (i) observed facial affect, (ii) self-reported affect, and (iii) physiological responses. Finally, I explore the relations among these different measures of affective empathy.

#### **(i) Observed facial affect**

The empathy literature, like the regulation literature, has also focused on the specific emotion expressed by children during a challenging situation. Conceptually, an empathic responses consists of "sorrow or concern for the distressed or needy other" and includes an awareness of the distinction between the self and the victim (Eisenberg, 2000b, p. 678), but it is not clear how such empathy will be expressed affectively in different contexts. Empathic responses are hypothesised to result in prosocial behaviours to alleviate the distress of another (Eisenberg & Fabes, 1990; Hoffman, 1982). However, an observer can respond to another's distress in a variety of different ways, not just empathically. An individual may be unresponsive to another's distress or may respond to another's plight with personal distress (Eisenberg, 2000b).

In Eisenberg's formulation, personal distress is a self-concerned, aversive response to another's plight, and is thought to lead to attempts to reduce one's own distress rather than the distress of the victim. The affective response of personal distress may be understood within the framework of empathy proposed by both Eisenberg and Hoffman, as well as by Harris (1989; see Chapter 1). For Eisenberg and

Hoffman, personal distress results from empathic over-arousal, whereby the emotional arousal felt at the plight of another becomes overwhelming and is not adequately regulated (Eisenberg, Fabes, Murphy, et al., 1996; Hoffman, 1984). Conversely, from Harris's (1989) perspective, personal distress results from a (relative) failure of perspective taking and is a reflection of emotional contagion. In this sense, Eisenberg and Hoffman focus on the affective response of the child when faced with an empathy eliciting event, whereas Harris focuses on the child's perspective taking ability. The important difference between the two conceptualisations is that Eisenberg and Hoffman maintain a distinction between the initial empathic response, which can lead to personal distress in the poorly regulated child, and the feelings of sorrow or concern for the victim that can (but do not necessarily) arise in the well-regulated child.

While the distinction between children's affective empathic responding and their personal distress appears clear, there is a considerable degree of disagreement in the empathy literature as to which specific affective response corresponds to empathy. Some researchers conceptualise affective empathic responses as a match between the emotion expressed by the child (observer) and that experienced by the victim (e.g., Strayer, 1993). When affective empathy is conceptualised as a match, it is typically understood as an expression of sadness. This is the traditional conceptualisation of empathy, which has also found its way into the neuroscience debate around empathic functioning via some kind of mirror neuron system (e.g., Gallese, 2001). Conversely, the facial expression of concern and worry when faced with an emotionally evocative event are also thought to be an empathic response (e.g., Hastings, et al., 2000), or sympathetic responses provoked by an initial empathic response (e.g., Eisenberg, 2000b; Fabes, et al. 1990). However, despite this distinction, expressions of both sadness and concern when faced with an empathy inducing event have been found to be positively related to children's prosocial behaviours (e.g., Eisenberg & Fabes, 1990, 1995; Miller, et al., 1996; Roberts & Strayer, 1996; Vaish, et al., 2009; Zahn-Waxler, et al., 1995), suggesting that both expressions may be understood as empathic in different contexts. Or, rather,

empathic children may potentially enact either response depending on the situational determinants of the empathy inducing situation.

One reason for the apparent contradiction in the empathy literature, namely the finding that both sadness and concern are associated with empathic responses and prosocial behaviour, is an inability to methodologically distinguish between expressions of empathic sadness and personal distress (Eisenberg, McCreath, et al., 1988). A close examination of the coding schemes of some of these studies suggests that empathic concern includes facial movements typical of both facial concern and sadness (e.g., Vaish, et al., 2009; Zahn-Waxler, et al., 1995). For example, both Vaish et al. and Zahn-Waxler et al. include aspects of facial sadness in their coding of concern, and both studies found that these expressions were related to their prosocial behaviours.

A reconciliation of the different manifestations of facial affective empathy is that appropriate empathic behaviour is a function of the context, the child's relation to the context and development. For example, sadness can be understood as either an *other-oriented* empathic response or *self-oriented* distress. The key in differentiating these two interpretations is a close examination of the experimental context (Eisenberg et al., 1989; Hoffman, 1984). Thus, in keeping with Eisenberg's framework, it is likely that the empathic sadness—personal distress distinction, rather than a focus on specific emotions, is critical for distinguishing empathic from non-empathic affective responses to emotionally evocative events. For example, Eisenberg et al. (1988) found that *both* expressions of sadness and concern when faced with a video of children hurt after falling off play-equipment were related to prosocial behaviours in a peer interaction, whereas expressions of anxiety, indicative of personal distress, were not related to prosocial behaviours.

**(ii) *Self-reported affect***

In addition to facial affect, studies have also asked children how they have felt during empathy inducing events as an indication of their affective empathy. When empathy is assessed via children's self-report, there is a similar emphasis on the correspondence between the child's feelings and the emotions experienced by a protagonist (e.g., Feshbach & Roe, 1968; Iannotti, 1975). For example, Iannotti

(1985) assessed empathy as an emotional match between the protagonist in the story vignette and the child's self-reported affect. With these verbal measures, however, children must articulate and interpret their own experience and that of the story protagonist, a potentially demanding cognitive task for a young child.

Research using children's self-reported affect has failed to find a consistent association between verbally reported affect during an empathy inducing event and the hypothesised prosocial behaviours that are proposed to be the result of an experience of empathy (e.g., Eisenberg, McCreath, et al., 1988; Iannotti, 1975; Miller, et al., 1996). This lack of association may be due to the way empathy is elicited in studies using self-reported affective empathy. It is typical in this research to use picture-story vignettes, that is a vignette accompanied by still images, as opposed to video vignettes, which is common when assessing facial affective empathy (e.g., Iannotti, 1975). Eisenberg and Miller (1987) and Miller and Eisenberg's (1988) reviews on the association between empathy and social adaptation emphasise the importance of the methods used to elicit empathy. The picture-story vignette typical of the literature examining children's self-reported affect may not be emotionally engaging enough to elicit an empathic response. Furthermore, children's self-reported affect on the picture-story vignettes have been found to be more susceptible to demand characteristics, as well as external factors such as the sex of the experimenter, which may all contribute to the modest relations between self-reported empathy and prosocial behaviours (Eisenberg & Fabes, 1990).

### **(iii) *Physiological responses***

Much like the emotion regulation research, the empathy literature has also devoted attention to the physiological correlates of emotional arousal. In general, more empathic children are expected to be more physiologically aroused by distress in others (Hastings, et al., 2000). Typically, children's heart rate changes or heart rate variability has been assessed during empathy eliciting events. Heart rate increases tend to be marker of directly or vicariously elicited arousal, and has been documented across numerous studies (e.g., Anastassiou-Hadjicharalambous & Warden, 2007; Calkins & Dedmon, 2000; Eisenberg, McCreath, et al., 1988; Zahn-

Waxler, et al., 1995). However, findings on the relation between heart rate and empathy tend to be mixed, and Eisenberg, Fabes and colleagues (Eisenberg & Fabes, 1990; Eisenberg, Fabes, Murphy, et al., 1996; Fabes, et al., 1990) have generally found only modest relations between children's heart rate or heart rate variability and their empathy. The majority of findings demonstrating an association between heart rate or heart rate variability and empathy have been for boys (e.g., Eisenberg, Fabes, Murphy, et al., 1995; Fabes, et al., 1993).

Although there are inconsistent relations between heart rate and other indices of empathy, there are consistent relations between heart rate during empathy inducing events and prosocial behaviour. Eisenberg and Fabes (1990) found patterns of relations between heart rate during empathy inducing video vignettes and children's subsequent prosocial behaviour to a victim in distress, as well as dispositional prosocial behaviour as rated by teachers. Similar findings have been reported by Zahn-Waxler and colleagues (1995). They found that preschool children with higher heart rate in response to simulated distress were more prosocial. Conversely, children who had low physiological responsiveness to the emotional displays of others were more likely to behave in a socially insensitive manner (Liew, et al., 2003). With respect to heart rate variability, as expected from the emotion regulation literature, those children with greater heart rate variability during empathy inducing events were also more likely to be rated by mothers or teachers as prosocial (e.g., Eisenberg, Fabes, Karbon, et al., 1996; Hastings, et al., 2000). However these findings have not been uniform, for example, Van Hulle et al. (2000) found no relation between heart rate measures of empathy and aggression in early childhood.

***(iv) Relation between different measures of affective empathy***

Several studies have examined the relation between the various indices of affective empathy and, on the whole, there appear to be only modest relations between children's facial affect, self-reported affect and physiological responses to empathy inducing events. This is troubling as these measures are all purported to assess the same underlying construct. In particular, self-reported affect has been found to be generally unrelated to other measures of affective empathy (e.g.,

Eisenberg, McCreath, et al., 1988). For example, Strayer and Roberts (1997) examined the convergence between facial and verbal measures of empathy when empathy was elicited vicariously using a series of emotional video vignettes. There was only a very modest convergence between what children said they felt during the empathy vignettes and their observed facial expression. Furthermore, facial and self-reported empathy, both conceptualised as a match between the emotion expressed by the vignette protagonist and child, failed to significantly converge. In a similar study, examining the association between children's self-reported emotional responses and their facial affect during a broad range of non-empathic emotion eliciting events, Durbin (2010) found only modest convergence between expressed and reported affect for children between three and six years of age.

Physiological measures, however, have demonstrated a more consistent pattern of relations to other measures of affective empathy. Both Hastings et al. (2000) and Zahn-Waxler et al. (1995) found that greater heart rate and heart rate variability in preschoolers was associated with observed facial expressions of empathy, conceptualised in these studies as expressions of empathic concern. This finding was supported by a study by Anastassiou-Hadjicharalambous and Warden (2007). They examined the relation between all three measures of affective empathy and found a modest relation between children's heart rate during a series of empathy inducing video vignettes and their observed facial affect. However, unsurprisingly, there was no significant relation between heart rate and self-reported empathy expression.

In sum, the current section has examined three methodological approaches to the assessment of children's affective empathy; observation of the child's facial affect, self-reported affective response and physiological responses to an empathy inducing event. While these three measures are all considered indicative of children's affective response to another in distress, the pattern of associations across these different measures is not always consistent, suggesting that these measures may index different aspects of children's emotional response. In the following section, I discuss methodological approaches to the assessment of children's cognitive empathy.

### 2.3.2 Cognitive empathy

Given the importance of psychological perspective taking for empathy, particularly in complex social interactions, various researchers have treated emotion understanding and perspective taking measures as more or less direct assessments of cognitive empathy (e.g., Blair, 2005; Underwood & Moore, 1982). For example, Blair (2005) argues that the ability to conceptualise the mental states of others, that is, theory-of-mind understanding, is a form of empathy. However, this interpretation of empathy neglects the primacy of vicarious affective arousal inherent in the definition of empathy (Eisenberg, 2000b; Hoffman, 1984). Indeed, even Harris, who sees contagion and perspective taking potentially in some kind of competition, by no means denies the importance of vicarious affect for empathy. He would appear to maintain, however, that an empathic response is one in which the child allows themselves to take the other person's perspective and thereby, potentially, experience *how it feels to be them*.

Underwood and Moore (1982) also highlight the importance of vicarious affect in the definition of empathy. While sophisticated empathic responses require some psychological perspective taking, perspective taking alone is not considered sufficient for empathy. That is, empathy involves not only the ability to understand another's psychological perspective, but also the demonstration of shared affect. Accordingly, the cognitive and affective components of empathy do not work in isolation. When one encounters an empathy inducing situation affective arousal and socio-cognitive understanding interact and both contribute to the empathic (or non-empathic) experience (Hoffman, 1984).

In order to simultaneously assess both the affective and cognitive components inherent in empathic responding, Strayer and Roberts (2004b) developed an interview, the *empathy continuum*, in which children are asked to attribute emotions to a story protagonist (in some misfortune) and themselves, and explain why they feel the way they do. Thus, in attempting to operationalise the child's level of empathic responsiveness when witnessing the emotional plight or distress of another, Strayer's (1989, 1993) empathy continuum interview assesses both the child's affective response to the emotional event, as well as the child's

cognitive appraisal of his/her elicited emotion. Empathic responses on the empathy continuum are those in which the self-attributed emotion matches or closely resembles that attributed to the protagonist, and the child shows some evidence of perspective taking in his/her explanation. In research examining the properties of the empathy continuum, it was found that, as expected, children's empathy increased with age and, furthermore, there was an increased likelihood of an affect match when cognitive attributions were more sophisticated (Strayer, 1993). Empathy, as assessed by the empathy continuum, was also a significant predictor of children's prosocial behaviour (Roberts & Strayer, 1996). Thus, the empathy continuum, by combining both affective and cognitive responses to the plight of another, provides a unique and useful index of children's empathic responses.

Thus far, I have examined direct measures of children's affective and cognitive empathy. In the following section, indirect measures of children's empathy are examined.

### **2.3.3 Indirect measures of empathy**

Empathy is also commonly assessed indirectly via the assessment of children's behavioural response to another in distress. Prosocial behaviours directed towards alleviating another's distress are understood as motivated by a feeling of empathy. In addition to behavioural measures of empathy, like the emotion regulation literature, children's dispositional empathy is commonly assessed using other-informant and self-reported questionnaire methods.

#### ***(i) Consequences of empathic arousal: Prosocial behaviours***

Empathy has long been regarded as an important precursor to prosocial and altruistic behaviours (Iannotti, 1975). Thus, many studies have focused on the child's tendency to enact prosocial behaviours (i.e., helping, caring and sharing behaviours) when faced with the emotional distress of another as an index of empathy (e.g., Hastings, et al., 2000; Strayer, 1980; Zahn-Waxler, et al., 1995; Zahn-Waxler, et al., 1992). For example, Strayer (1980) observed preschool children's interactions with peers and inferred empathy by examining their behavioural response to a peer in distress. Children were regarded as empathic if they exhibited instrumental behaviours, such as comforting, to alleviate their peers' distress. Similarly, in a study

by Eisenberg and colleagues (1996), comforting behaviours were related to vicariously aroused affect, such that girls more likely to comfort a crying infant were less likely to become distressed during an empathy inducing video vignette. This was taken to support some relation between prosocial behaviours and affective empathy. However, while helping and caring behaviours are frequently thought to be motivated by an empathic response to another in distress, empathy alone is not a necessary or sufficient condition to inspire helping behaviours. Indeed, the relation between helping and caring behaviours in an empathy eliciting situation and other measures of empathy is not always apparent (e.g., Ungerer et al., 1990). Furthermore, comforting and helping behaviours assessed in empathy eliciting tasks are not always related to children's prosocial behaviours in other tasks, as would be predicted if they were measures of children's empathic responses (e.g., Strayer, 1980). Indeed, it goes without saying that prosocial behaviours can be initiated because of non-empathic motives, such as consistent socialisation practices (Hastings, Utendale, & Sullivan, 2007).

Finally, it should be noted that sometimes prosocial, comforting behaviours purported to result from empathic arousal, such as measures of facial affective empathy, are scored together in a global measure of empathy. For example, Hastings et al. (2000) developed a global measure of empathic concern that included facial affective concern, vocal indicators of concern, as well as active concern encompassing helping and caring behaviours. Concern was operationalised to include both affective and behavioural instances of concern as well as prosocial behaviours. When combined scores are used, it is difficult to ascertain the relation between different measures of empathy, and children's social adaptation.

**(ii) Questionnaire measures of dispositional empathy**

Questionnaire measures of empathy assess children's dispositional (trait) levels of empathy across broad empathy inducing situations. Questionnaire measures of empathy may be contrasted with affective and cognitive measures that index empathy during very specific eliciting events. Studies employing the conceptualisation of empathy as a dispositional trait typically assess the child's proclivity to care about others, the degree to which they express emotions (i.e.,

emotionality), as well as empathic responsiveness to the emotional distress of another.

The most commonly used assessment of children's dispositional empathy is the Bryant empathy index (Bryant, 1982). Originally designed as a self-report assessment of empathy for children and adolescents, it has since been adapted for use by parents and teachers to report on children's empathy (e.g., Dadds et al., 2008; Malti, Perren, & Buchmann, 2010). The Bryant empathy index includes items that assess children's affective responses to other's emotional distress, for example, *seeing a boy/girl who is crying makes me feel like crying*. More recently, an examination of the factor structure of the Bryant empathy index suggest that the scale is comprised of two factors (de Wied et al., 2007). The first factor comprises items assessing children's *empathic sadness*, and includes items that assess children's responsiveness to another's sadness. The second, less stable, factor comprises items assessing children's attitudes to another's expression of emotions (e.g., *girls who cry when they are happy are silly*). This factor analysis suggests that the widespread acceptance of the Bryant empathy scale as a unitary index of children's empathic tendencies may be premature.

In a study by Malti and colleagues (2010), children's empathy was assessed by parents and teachers, in addition to self-report using an abridged version of the Bryant empathy index. Despite the fact that the same scale was used across informants, there were only modest relations across teacher, parent and self-reported dispositional empathy. However, when other empathy scales have been used across informants, such as the Child Empathy Scale (Eisenberg, Fabes, Murphy, et al., 1996), there has been more consistency across parent and teacher reports (e.g., Eisenberg, Michalik, et al., 2007). Examining the relations across different measures of empathy, Hastings et al. (2000) found little correspondence between either maternal or self-reported dispositional empathy as assessed by the Bryant empathy index and children's concerned affective empathy expressions during a simulated distress paradigm. This may be because direct measures of empathy only assess children's empathic responding in a single setting, which may not necessarily be indicative of their general empathic tendencies.

Problematically, questionnaire measures of children's dispositional empathy often comprise items that overlap with or are similar to informant-based measures assessing children's prosocial behaviour and social skills. Thus, the relation between children's dispositional empathy and their social competence may be artificially inflated, a problem that highlights the need for independent measures of empathy and prosocial behaviour. Furthermore, other-informant based ratings of empathy necessarily only assess observable manifestations of an empathic response; they are unable to provide information on the affective and cognitive aspects of empathic arousal.

### **2.3.4 Summary**

In this section, different measures of children's empathy have been discussed, with a particular focus on affective measures of empathy comprising facial affect, self-reported affect and physiological responses to an empathy inducing event. In addition to affective empathy, children's cognitive empathy was discussed. Finally, indirect measures of empathy were examined, including measures of children's prosocial and caring behaviours and dispositional empathy, typically measured with parent or teacher questionnaires. This chapter concludes with a brief discussion of the overlap between measures of empathy and emotion regulation, and an outline of the methodological approach taken in the current thesis.

## **2.4 Emotion regulation and empathy**

As has been shown above, the methodology used to examine children's empathic responsivity shares much with the emotion regulation literature. In particular, direct observational measures of empathy often rely on paradigms that are used to assess children's regulatory behaviours. This is not surprising given the close conceptual relation between children's regulatory behaviours and their abilities to respond to others in an empathic manner. However, it does pose problems when attempting to understand the nature of the relation between emotion regulation and empathy, and their independent influence of children's developing social adaptation. In empathy research the focus is on how the child responds to a protagonist or research confederate in distress or discomfort, while

the emotion regulation research focuses on how children responds when faced with an emotion eliciting event of any kind. The close link between emotion regulation and empathy, and the overlapping methodology used to examine these aspects of children's behaviour, is seen most acutely in the study of children's expressive responses to emotional events. Both the empathy and emotion regulation literatures examine the specific affect expressed and use it to draw conclusions on the degree to which the child may be considered empathic or well-regulated.

Despite the close methodological and conceptual link, researchers have rarely assessed children's behavioural regulation and empathic responding in the same paradigm (Eisenberg, Spinrad, & Sadovsky, 2006). That is, there is little research investigating children's behavioural strategies to regulate arousal when faced with an emotionally challenging and empathy inducing event simultaneously with the measurement of their affective empathy. There does exist research, however, that examines the link between behavioural instances of empathy and dispositional regulation, as measured by parent and/or teacher report (e.g., Eisenberg & Fabes, 1995; Gurthrie, et al., 1997). Similarly, other research has considered children's observed behavioural emotion regulation when faced with emotionally challenging events and their dispositional empathy as measured by self, teacher or parent report (e.g., Eisenberg, Fabes, Murphy, et al., 1996; Murphy, Shepard, Eisenberg, Fabes, & Guthrie, 1999; Rothbart, Ahadi, & Hershey, 1994). Overall, the relation between direct measures of empathy and questionnaire measures of emotion regulation tend to be more modest compared to the relation between questionnaire measures of empathy and direct measures of children's regulatory strategies (Eisenberg, 2000a). This may be because children's empathic responses in a given situation may not be an accurate reflection of their general proclivity to respond empathically. Clearly, however, this research is unable to speak to the contemporaneous use of emotion regulation strategies and children's empathy in a given emotion eliciting situation.

Broadly, studies examining both emotion regulation and empathy have suggested a close relation between the two constructs, providing support to the framework proposed by Eisenberg and Fabes (1992) and Hoffman (1982) implying a

conceptual link between emotion regulation and empathy. However, the strength of this relation is methodologically dependent. In the final section of the current chapter, I outline the methodological approach to the measurement of emotion regulation and empathy taken in the current thesis.

### **2.5 Methodological approach employed in the current thesis**

The methodological approach taken in the current thesis is informed by the discussion presented in this chapter, in addition to the conceptual discussion of the emotion regulation construct presented in Chapter 1. This thesis examines children's behavioural regulatory strategies and affective empathy in response to emotionally challenging and empathy inducing video vignettes. This approach allows the relation between emotion regulation and affective empathy to be examined in a single situational context. Furthermore, this approach avoids the potential problems with parent and teacher report of emotion regulation and empathy, for example, possible confounds with questionnaire measures of social adaptation and conceptual issues with the context-free nature of emotion regulation questionnaires. Parent and teacher questionnaires are used in the current study, but these informants report exclusively on children's social adaptation. Cognitive empathy in the same situational context will also be assessed, and is discussed in greater detail in Chapter 6.

Empathy inducing events necessarily elicit both emotion regulation and empathy, although it is expected that not all children will evince empathy. By assessing children's emotion regulation and empathy in the same context, this thesis is able to speak directly to the relation between these two constructs. However, this also highlights a difficulty in disentangling different components of the emotional response, that is, the emotional experience (or empathic response) versus emotion regulation. The emotion elicitation paradigm employed in the current thesis attempts to examine behavioural and affective responses separately.

Furthermore, by including multiple emotion eliciting events, the current methodology attempts to delineate between those behaviours that are indicative of children's responding in general (i.e., temperamental predispositions towards certain behavioural responses) and behavioural responses employed in the service

of emotion regulation. Thus, in the current thesis, temperament is assessed via continuity in responding across a range of contexts. Behaviours that are relatively consistent across different challenging events are probably best thought of as stable individual differences of children's behavioural responses. In contrast, those behaviours that show a close, predictable association to specific eliciting events are likely to reflect regulatory responses.

In the first study (Chapter 3), children's behavioural and affective response to a single emotionally challenging and empathy inducing vignette will be examined, with a close focus on children's responses to specific events in the emotional narrative as they unfold. In the second study (Chapters 4 through to 9), children's behavioural and affective responses will be examined under various different conditions (e.g., distress, fear, anger, exclusion), deliberately selected to test a priori beliefs about children's responses. Furthermore, in Study 2 children's behavioural and affective responses are examined over time, which allows for an investigation of the stability and change in children's emotion regulation and empathy responses.

## Chapter Three<sup>1</sup>

### Emotion elicitation in a single context

#### 3.1 Introduction and aims

The ability to adaptively regulate emotional responses is important for many aspects of children's social functioning (Eisenberg, Valiente, et al., 2010; Halberstadt, et al., 2001; Saarni, 1999) and, as seen in Chapter 2, by early school age children have a large repertoire of behavioural strategies to maintain or modify emotional arousal (Thompson, 1994). Despite the fact that behavioural strategies are used throughout the life-span to regulate arousal, the majority of research in this area has focused on the strategies employed by infants and toddlers; fewer studies have explored the behavioural strategies of school-aged children. The current chapter examines the different behavioural responses enacted by children, just prior to school entry, when faced with an emotionally evocative event.

The aim of this chapter is both methodological and exploratory, and it consists of four parts. The primary focus is to document the nature of children's behavioural responses to a video vignette chosen to be distressing but also potentially empathy inducing. Children's behavioural responses are broadly construed and include both voluntary and involuntary actions, as well as affective expressions. Second, this chapter examines how such responses are related to specific events unfolding within the vignette narrative. Third, the consistency of behavioural responses within different epochs of the video narrative, and the relation between different behavioural responses, will be considered. Finally, the association between children's behavioural responses and their social conduct (as rated by mothers) is examined.

As outlined in Chapter 2, there are many different paradigms for eliciting arousal and regulatory behaviours in young children. In the current study, children's behavioural responses were examined in a context of an emotionally evocative vignette, whereby an emotional response was elicited vicariously. The emotional

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<sup>1</sup> <sup>1</sup> The sample presented in the current chapter was recruited prior to the commencement of this thesis, but the development of scoring protocol, behavioural coding and analyses is novel. The sample is described by de Rosnay et al (2004), experiment 2.

vignette comprised a real infant-mother separation, in which the infant protagonist (Tom) experiences distress at being left alone. Parent-child separations are known to be distressing for young children and have been used broadly in developmental psychology to induce stress and elicit regulatory behaviours (e.g., Grolnick, et al., 1996; Molitor, Mayes, & Ward, 2003; Sethi, et al., 2000). Typically, in behavioural regulation research, video vignettes employed to elicit emotion are acted scenarios taken from television or film (Eisenberg, Fabes, Murphy, et al., 1996; Strayer & Roberts, 1997). However, it was thought that authentic video footage was more likely to elicit vicarious affective responses because of the genuine emotion displays, as opposed to acted or contrived displays of emotion. Furthermore, the infant-mother separation vignette represents an emotional scenario that children are likely to have experienced themselves and/or witnessed in siblings and peers. It is, therefore, expected that the emotional content of the vignette, in addition to eliciting emotional arousal and regulatory behaviours, would also elicit empathic affective responses in children. It is important to emphasise that children's behavioural responses to the infant-mother separation vignette will not be examined from the point of attachment. Instead, the current study focuses exclusively on children's behavioural responses to the video and the vignette narrative, *per se*.

In order to infer that an emotionally evocative vignette is eliciting distinctive behavioural responses that are meaningfully related to the emotional content of the scenario, Cole, Martin and Dennis (2004) propose the use of an experimental design allowing for *contrasting conditions*, so that children's behavioural responses to different eliciting conditions can be compared. That is, the use of scenarios with differing emotional content, such as contrasting anger and fear evoking conditions (e.g., Diener & Mangelsdorf, 1999), or contrasting an emotionally evocative and neutral condition (e.g., Fabes, et al., 1993). Using such methods, specific associations between children's behavioural responses and the content of an emotion eliciting event has been demonstrated in infants, toddlers and young school-aged children. For example, in a comparison of frustration and fear induction, Diener and Mangelsdorf (1999) found that toddlers responded with distinctive affect and

behavioural responses to each situation. Furthermore, in a study with preschoolers and seven year old children, Eisenberg et al. (1988) found that distinctive behaviours were consistently associated with the emotional content of the emotionally evocative vignettes: when children viewed a fearful film they were more likely to respond with disengagement and expressions of fear, while they were more likely to express sadness and concern in response to a sad vignette depicting the death of a family pet. What is less clear from the existing literature is how children's responses vary within a given narrative. That is to say, for example, do specific events or transitions in a given story reliably bring about changes in children's behaviour.

The current study adopts a variation on the contrasting conditions approach. The infant-mother separation vignette presented to children in the current study tells the story of an infant who endures a separation from his mother. The vignette begins with the infant and the mother together. However, after a short period of time, the mother prepares to leave and ultimately exits the room. Once the infant has been left alone he becomes increasingly distressed. In keeping with the contrasting conditions approach, this vignette was divided into three distinct epochs to capture the changing emotional tone of the vignette narrative. The first epoch, the *neutral* epoch, comprises a non-emotional period during which the infant and the mother are together. The second epoch, the *transitional* epoch, includes the somewhat ambiguous period when the mother initiates behaviours that signal to the infant that he is going to be left alone. The third and final epoch, the *separation* epoch, depicts the protagonist's clear emotional distress at the separation from his mother. The division of the vignette into these three epochs allows a comparison of children's behavioural responses that are specifically elicited by; (i) the anticipation of ensuing emotional events (transitional epoch), and (ii) another's emotional distress (separation epoch). In this manner, the mother-infant separation vignette simulates a relatively ordinary, if somewhat distressing, sequence of events that children might be expected to have encountered in some closely related form. The rationale for the procedure, as employed here, is to examine systematic behavioural changes in relation to the three epochs, which reflect the unfolding of events in real time.

### 3.1.1 Behavioural responses

As explored in Chapter 2 (Section 2.2.1), studies involving emotionally challenging situations, whether direct or indirect, have shown that children display certain behaviours in the face of distressing content, and some of these behaviours have been hypothesised to assist in regulating emotional arousal (see Chapter 2, Section 2.2.1 and also Diener & Mangelsdorf, 1999; Gilliom, et al., 2002; Grolnick, et al., 1996). Children in the current sample are older than the typical age at which behavioural responses to emotional events have been examined. However, important socio-emotional milestones evident during the transition to school, such as negotiating new peer relationships and adapting to a structured school environment, make studying the emotional regulation of children transitioning to formal school important.

Although the children in the present study were, for theoretical reasons, chosen to be older than typically studied in the literature (although see Eisenberg, Fabes, et al., 1988; Eisenberg, et al., 1997), the behaviours of interest are nonetheless derived from the extant literature covering early childhood. Indeed, the strategies employed by infants and toddlers to regulate arousal have been argued to be foundational for the more sophisticated regulatory strategies employed by school-aged children (Kopp, 1989; Thompson & Calkins, 1996). Thus, similar behavioural strategies to emotionally challenging events may be reasonably expected to be seen in both younger and older children. With increasing age, however, these strategies are expected to be used more discerningly to achieve social goals. That is, the capacity to regulate emotional arousal depends not only on the development of regulatory strategies but also on the situational demands placed upon the child in specific situations (Thompson & Calkins, 1996). For example, the use of disengagement to regulate arousal may be adaptive in toddlerhood when faced with a challenging social encounter. By school-age, however, disengagement from a challenging event may be at odds with the child's situational social goals. That is to say, it is entirely plausible that the behavioural repertoire of children will show a high degree of consistency but it remains to be seen how five year olds employ such behaviours in the face of a distressing event.

Five discrete behaviours are examined and scored in the current study; (i) disengagement, (ii) self-soothing, (iii) communicative bids, (iv) agitative activity, and (v) affective expressions. These behaviours have been shown to be typical responses to emotionally challenging events and, under specific circumstances, have been shown to be indicative of regulated responding (see Chapter 2, Section 2.2.1).

***(i) Disengagement***

As outlined in Chapter 2, disengagement is a fundamental strategy children employ to regulate their emotional arousal when faced with emotionally evocative stimuli, and has been widely studied across childhood (e.g., Cole, et al., 2004; Buss & Goldsmith, 1998; Diener & Mangelsdorf, 1999; Eisenberg, Fabes, et al., 2000; Eisenberg, et al., 2004; Gilliom, et al., 2002; Grolnick, et al., 1996; Kopp, 1989). Furthermore, the control of attention to regulate emotion, including both disengagement and attention focusing, is the one behavioural strategy that has been closely examined in school-aged children (e.g., Eisenberg, Fabes, et al., 1988; Eisenberg, Fabes, Murphy, et al., 1996). Both disengagement and attention focusing, in different contexts, have been associated with adaptive emotion regulation and socially competent behaviours. (e.g., Calkins, et al., 1999; Cortez & Bugental, 1994; Eisenberg, Fabes, Guthrie, et al., 1996; Gurthrie, et al., 1997; Raver, et al., 1999). Indeed, the importance of eliciting context for interpreting relations between disengagement and social behaviours is highlighted by Cortez and Bugental (1994), who found no relation between disengagement and social competence when the emotional stimuli was neutral or positive.

The current study examines children's use of disengagement during the anticipation and escalation of emotional distress in an infant protagonist during a separation from his mother. The literature examining children's disengagement during emotionally challenging events has shown that avoidance increases as emotional arousal increases (e.g., Buss & Goldsmith, 1998); although it is unclear if this relation entails equally with all emotions. Therefore, it is predicted that with an escalation and continuation of the distressing emotional content of the vignette, children will rely more heavily on the behavioural strategy of disengagement. Importantly, however, the infant-mother separation vignette should not elicit

excessive arousal in well-regulated children, as the emotional separation theme comprises an experience that children of this age should be able to manage effectively. As such, it is expected that relatively high levels of disengagement will distinguish those children who are more poorly emotionally regulated and, therefore, it is expected that greater disengagement will coincide with higher levels of problem behaviours as reported by mothers.

***(ii) Self-soothing behaviours***

As outlined in Chapter 2, self-soothing behaviours, while regulating emotional arousal in infants and toddlers (Grolnick, et al., 1996; Rothbart, et al., 1992; Stifter & Braungart, 1995), are unlikely to serve a regulatory function by preschool age (Gilliom, et al., 2002). Against this backdrop, self-soothing behaviours in older children may be better construed in terms of individual differences. Self-soothing behaviours in the face of an emotionally evocative event are assessed in the current study but given the extant literature (e.g., Gilliom, et al., 2002), it is predicted that this behaviour will be relatively infrequent. The use of self-soothing behaviours as an index of emotional arousal may emerge as a distinct feature of individual children's behavioural response styles and, as a result, self-soothing behaviours are not expected to show a marked relation to the emotional content of the vignette. Rather, it is predicted that a relatively small number of children will engage in self-soothing regardless of the content of the vignette. No specific predictions are made regarding the relation between self-soothing behaviours and children's social competencies, however, given the marked decrease in self-soothing behaviours over infancy and toddlerhood, it is possible that consistent use of self-soothing could indicate some behavioural immaturity.

***(iii) Communicative bids***

Communicative bids, comprising both looks and verbalisations typically directed toward the caregiver, potentially provide both reassurance and information about the event causing distress. Children's use of communicative bids has been associated with the regulation of emotional arousal (Buss & Goldsmith, 1998; Diener & Mangelsdorf, 1999) and socially competent behaviours (Calkins, et al., 1999; Gilliom, et al.). However, the relation between children's communicative bids and

social competence has only been examined in young children; the relation between school-aged children's communicative bids and their social competence has yet to be ascertained, and is examined in the present chapter.

In the current study, children's communicative bids will be examined during the infant-mother separation vignette. It is expected that with the escalation and persistence of the emotional distress of the vignette protagonist, children will increasingly need to gather information on the content of the vignette and will make a greater number of communicative bids towards the experimenter or caregiver. Given the lack of research examining communicative bids in older children, no specific predictions regarding the relation between communicative bids and social behaviours are made. However, given the association between communicative bids and social competence in younger children, it is expected that children who demonstrate more communicative bids will be rated as more socially competent.

***(iv) Agitative activity***

Two types of agitative activity are typically coded when examining children's behavioural responses to emotionally challenging events (see Chapter 2, Section 2.2.1). First, children's gross agitative activity, such as stomping feet, has been examined. Most commonly, gross agitative activity has been observed in toddlers and young children (Diener & Mangelsdorf, 1999). In older children, however, more nuanced measures of agitative behaviours are measured, such as nervous mouth, lip and chin movements. Eisenberg and colleagues conceptualise these minor agitative movements as a behavioural marker of distress (Eisenberg, Fabes, et al., 1988; Eisenberg, Fabes, Guthrie, et al., 1996). As a result, children's ability to inhibit agitative activity has been examined as an index of regulation. For example, children able to inhibit activity while waiting for a task to start have been considered better regulated and found to be more socially competent (Eisenberg, et al., 2001; Eisenberg, Michalik, et al., 2007).

The current study makes a detailed examination of children's agitative activity in an emotional context, including: (i) gross movements, comprising more overt tension release behaviours such as those coded by Diener and Mangelsdorf (1999); and (ii) minor movements, such as fidgeting and facial grimaces like those

coded by Eisenberg and colleagues (Eisenberg, Fabes, et al., 1988; Eisenberg, Fabes, Guthrie, et al., 1996). There is little research on the association between children's agitative activity and adaptive emotion regulation. However, hyperactivity is a prominent feature of children's behavioural disorders. In particular, externalising behavioural problems, including hyperactivity and impulsivity, are associated with poor emotion regulation (Eisenberg, et al., 2001; Mullin & Hinshaw, 2007). Also, children's impairments in motor control, more generally, have been shown to relate to externalising behavioural problems, in particular attention-deficit/hyperactivity disorder (Barkley, 1997). The specific link between children's inability to control their agitative activity when faced with an emotional event and children's general hyperactivity as assessed by teacher or parent measures has not yet been explored.

Given the literature documenting stable differences in children's overall level of activity (Mullin & Hinshaw, 2007), children's activity when faced with an emotional event is likely to emerge as moderately stable individual difference in behaviour. It is expected, therefore, that levels of activity across the three epochs of the infant-mother-separation vignette would be a relatively stable characteristic of children's responding, reflected in a relation between children's activity level during the emotionally challenging vignette and their maternally rated hyperactivity. Despite predicted continuity, it is also expected that mean levels of agitative activity will increase during those epochs with more challenging emotional content; the transitional and separation epochs. If activity is meaningfully associated with the escalation of the distressing content of the vignette, then it may be beneficial to make a division between excess activity in general and children's use of activity in an emotional context in an effort to modulate their arousal.

#### ***(v) Affect***

Affective responses are also typically examined in studies concerning children's behavioural responses to emotionally challenging events. However, as discussed in Chapter 2, there are a number of different ways of conceptualising children's affective responses to emotional events. Children's expressed negative affect may be understood as an indicator of the relative success or failure of the regulatory process (e.g., Buss & Goldsmith, 1998; Diener & Mangelsdorf, 1999;

Stifter & Braungart, 1995). An alternative way of conceptualising children's affective responses to an emotionally distressing event is through the empathy framework. Affective empathy responses typically comprise expressions of sadness (e.g., Eisenberg, Fabes, et al., 1988; Strayer, 1993) or expressions of worry and concern (e.g., Hastings, et al., 2000). The expression both of worry-concern and sadness have been associated with greater empathy in different contexts (e.g., Hastings, et al., 2000; Strayer, 1993; Zahn-Waxler, et al., 1992). These expressions have also been associated with positive social behaviours (Eisenberg & Fabes, 1990, 1995; Eisenberg, McCreath, et al., 1988; Fabes, et al., 1990; Miller, et al., 1996).

The theoretical framework articulated by Eisenberg and Fabes (1992) brings together emotion regulation and empathic responses, and posits that individual differences in empathic responses vary as a function of children's regulatory skills. That is, a well-regulated child should be able to vicariously experience the emotion of another (i.e., experience affective empathy) without becoming overly distressed (e.g., Eisenberg, Fabes, Murphy, et al., 1996; Gurthrie, et al., 1997). This does not imply, of course, that a well-regulated children will experience affective empathy. Rather, it implies that a poorly regulated, personally distressed child is unlikely to experience affective empathy.

In the current study, children's affective responding to the emotionally evocative vignette is firstly examined in the same manner as the other behavioural responses outlined above. That is, the duration and frequency of children's affective responses to the vignette, and the relation between affective responses and the emotional content across the three epochs is examined. Given the content of the emotional vignette, we expect that expressions of fear, anger and joy to be infrequent (e.g., Cole, et al., 1996). Expressions of sadness and worry-concern are expected to be greatest during the separation epoch of the vignette.

Once the patterns of children's affective responses across the epochs of the vignette are ascertained, children will then be categorised into affect groups based on the dominant expressed affect; thus children will be categorised as either *inexpressive*, *worry-concern* or *sad*, as outlined by Cole et al. (1996). In this manner, the relation between children's well-regulated responding and their affective

expressions may shed some light on the expressive response that may be characterised as empathic. Furthermore, the relation between children's predominant affect and their social conduct will be explored.

### **Summary**

This chapter is primarily methodological and exploratory, aiming to catalogue the behavioural responses of typically developing normal children to a vignette of real expressed emotion that should evoke some distress and empathy, just prior to the time of school entry. The first aim of the current chapter is, then, to establish how children's behavioural responses are manifest, and whether they can be reliably scored on a continuous basis. The second aim of this chapter is to directly examine the relationship between the events of the vignette and children's behavioural (including affective) responses. It is expected that children's behavioural responses will differ across the neutral, transitional and separation epochs of the infant-mother separation vignette in such a way that makes sense given the epoch content, and the existing literature examined above on behavioural responding. Thus, for example, it is expected that the emotional content of the vignette will elicit heightened levels of expressed affect and qualitatively different patterns of disengagement. In sum, it is expected that some behaviours (agitative activity and self-soothing) will be consistently observed across different emotional contexts, while others (disengagement and affect) are likely to be more specifically related to the content of the vignette, as outlined above. The third aim of the chapter is to explore the relationship between different behavioural responses both within and across different vignette epochs. Finally, the association between children's behavioural responses to the emotional vignette and their behaviour in other domains is examined using maternal ratings of children's problem and prosocial behaviours.

## **3.2 Method**

### **3.2.1 Participants**

Participants were 73 children (38 boys) between 54 and 72 months of age ( $M_{\text{age}} = 60$  months,  $SD = 4.1$  months). Children came from a mixture of middle, lower-middle, and working class families, and had English as a first language. These

children were part of an existing cohort of children who had been recruited at infancy to take part in a longitudinal study on infant sleep problems. These families were then contacted again when children were between 54 and 72 months, and invited to participate in the current study. From the 100 families contacted, 75 consented to participate in the current study. Two children were lost due to a technical fault. Full details of the initial sample can be found in Morrell (1999).

### **3.2.2 Behavioural responses**

The coding scheme was based upon the current literature which explores infant's and young children's behavioural responses to emotionally challenging events (e.g., Buss & Goldsmith, 1998; Calkins & Johnson, 1998; Eisenberg & Fabes, 1995; Gilliom, et al., 2002; Grolnick, et al., 1996; Kopp, 1989; Stifter & Braungart, 1995). The complete coding scheme with illustrative examples of behavioural codes is presented in Appendix B.

#### ***Disengagement***

Disengagement codes included all instances when the child's attention shifted away from the video vignette but could not be coded as a communicative bid (see below). Disengagement comprised of the functionally related behaviours of gaze avoidance, head avoidance and distraction, as is typical of the literature examining behavioural responses to distress (e.g., Rothbart, et al., 1992). The following three codes for disengagement are mutually exclusive.

*Gaze Avoidance*: involved shifting attention with the eyes away from the emotional stimuli whilst keeping the head stationary.

*Head Avoidance*: involved any instance of shifting attention using the whole head (e.g., look away, look down, turn head).

*Distraction*: included instances when the child initiated a novel coherent activity and the child's gaze was clearly focused onto the new activity.

#### ***Agitative Activity***

Agitative activity included all instances of children's movements that had an agitative quality. As such, this code did not include gross body movement such as shifting position or relaxed/smooth movements of the hand or arm. Movements that were not classified as agitative typically occurred in a fluid and calm manner. Gaze

did not have to be fixed for agitation to be coded and, as such, could be simultaneously coded with disengagement. A fine-grained definition of agitation was adopted and included separate codes for minor and gross agitative activity. Gross and minor agitative activity could be coded simultaneously.

*Gross agitative activity:* defined by movements of the body but also included any movement of the arms, shoulders, head or trunk; for example leg jiggling or restless bouncing in chair.

*Minor agitative activity:* included movements of the hands and fingers (e.g., finger tapping), nervous self-touching with the hands (e.g., hands to the face and hair) and fidgeting. Minor agitation also included unusual or contorted mouth movements.

### ***Self-soothing behaviours***

Self-soothing behaviours were determined by their repetitive quality and, as such, were persistent behaviours. Self-soothing included repetitive manipulation of the mouth with the hands or tongue, licking of lips, tongue and lip movements, and thumb-sucking, as well as non-mouth related movements such as hair twirling or repetitive stroking.

### ***Communicative bids***

This code was used when there was an instance of gaze or affect sharing with the experimenter or caregiver. In order to code a communicative bid there had to be a fixation point that involved the experimenter or caregiver. If the fixation point was ambiguous then head avoidance was scored instead. Communicative bids also comprised children's verbalisations directed toward the experimenter or mother irrespective of gaze. If the communicative bid included affect, for example when a child turned to their mother and smiled, the affect was not coded separately unless the affective expression remained once the child returned to viewing the vignette.

### ***Affect***

Facial expressions served as an indicator of children's outward emotional responding, and were based upon the AFFEX coding system (Izard, Dougherty, & Hembree, 1983). Anger, fear, joy and sadness expressions were coded according to the detailed criteria set out in the AFFEX system. This was supplemented by the

inclusion of the facial expression of worry-concern and postural sadness. All expressions of affect were mutually exclusive.

*Anger*: lips pressed together, mouth appears tense; eyelids tighten or narrow, inner corners of brow lowered; cheeks may be raised.

*Fear*: entire brow raised; eyes appear wider and tense; lip corners are drawn back.

*Joy*: lip corners raised; cheeks raised; crinkling around eyes, eyes may be squinted. Anxious smiles were not coded as joy (Eisenberg, Fabes, et al., 1988; Ekman & Friesen, 1978).

*Worry-concern*: brows are furrowed; eyes appear wide or may be squinted with raised cheeks; can include both scanning and focused eyes; mouth may be open (Cole, et al., 1996; Hastings, et al., 2000). This has previously been coded as concerned-attention (Eisenberg & Fabes, 1990; Gurthrie, et al., 1997; Miller, et al., 1996), interest-worry (Cole, et al., 1996) and interest (Izard, 1979). When this expression has been coded previously (e.g., Cole, et al., 1996; Eisenberg, Fabes, et al., 1988), it has sometimes been considered suggestive of children's attempts to inhibit negative emotion expressions (such as, sadness or anger) and therefore taken as a modulated or controlled expression. In the current study, the majority of children exhibiting worry-concern did so intensely and there was no *prima facie* reason to regard the expression as a modulation of sadness or anger.

*Sadness*: inner corner of brow raised; cheeks are lowered, or raised with squinted eyes; lip corners drawn down, bottom lip may be pushed outwards (including 'cry face', Campos, Emde, Gaensbauer, & Henderson, 1975; Kaye & Fogel, 1980).

*Postural sadness*: characterised by a postural droop, such as a slight slump, drop of the head and slump of the shoulders and was often accompanied by passive downcast mouth and blank gaze. Typically, there was an absence of movement. In the case that the child displayed both postural sadness and a sad expression, only sad expression was coded.

Only four children expressed joy or fear, and no child expressed anger during the vignette. Due to the low incidence of joy, fear and anger expressions, they are not discussed further.

### **3.2.3 Child behaviour problems and prosocial behaviour**

To assess children's social behaviours, mothers completed the Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997). The SDQ is a behavioural screening questionnaire for children and comprises 5 scales: (i) emotional problems, e.g., *nervous or clingy in new situations*; (ii) conduct problems, e.g., *often fights with other children or bullies them*; (iii) hyperactivity/inattention, e.g., *constantly fidgeting or squirming*; (iv) peer relationship problems, e.g., *rather solitary, tends to play alone*; and (v) prosocial behaviour, e.g., *shares readily with other children*. Each of the 5 scales was assessed by 5 items, rated on a 3-point likert scale (0 = not true, 1 = somewhat true and 2 = certainly true). The SDQ has been shown to be a reliable measure of children's social behaviour (Goodman, 2001) and is comparable to other comprehensive child behavioural screening questionnaires, such as the Child Behaviour Checklist (Goodman & Scott, 1999). Mothers were asked to complete the SDQ as many of the children had not yet started the school year.

### **3.2.4 Procedure**

The video vignette comprised an infant-mother separation and depicted a real infant's emotional responses (including distress) in the context of a clearly defined narrative (see Table 3.1). The vignette was divided into three epochs. In the first *neutral* epoch, participants were introduced to the infant protagonist, who was 12 months of age, and his mother in a surgery waiting room. The infant (Tom) plays on the floor with some toys (20 seconds). In the second *transitional* epoch, the narrator states that Tom's mother must go to see the dentist, and that Tom must wait by himself while his mother is away. Tom's mother then leaves the waiting room (20 seconds); Tom notices his mother leaving but does not yet show sustained distress. In the third *separation* epoch, Tom is audibly and visibly distressed at being left alone. His response includes fussing, crying and moving towards the door from where his mother left (60 seconds). The video included a recorded narrative with story details. It was necessary for the epochs to be of unequal length because they

reflect realistic transitions in behaviours and it was desirable to leave a substantial period of distress.

All children viewed the video in the presence of the experimenter with their mother seated beside or very close to them. There was no physical contact with the mother, but mothers were able to attend to the video and acknowledge their children's comments. Mothers were, however, asked to avoid entering into conversations with their child. Children viewed the video in their own home, with the exception of eight participants who were tested in a private room at their local general medical practice. Children were discreetly videotaped while viewing the vignettes.

Coding for all affective and behavioural responses was conducted using Observer XT (Noldus, 2008). This behavioural coding software suite allowed continuous coding and analysis. All behaviours were coded continuously for each of the three epochs. Durations of each code were converted into a percentage for each epoch. The percentage of time behaviours were expressed was used to allow the comparison of behaviours between epochs of unequal length.

Mothers completed the Strengths and Difficulties Questionnaire directly prior to their child's participation in the study.

Table 3.1.  
Story events and narrative for the infant-mother-separation vignette

| Epoch                           | Story Events   | Story Narration   |
|---------------------------------|--|---|
| 1. Neutral<br>(20 seconds)      | Mother and baby enter surgery                          | <i>This is a story about Tom and his mummy. They've gone to the dentist. Tom's mummy needs to see the dentist. They have to wait in the waiting room.</i> |
|                                 | Mother and baby wait by themselves in the waiting room | <i>There are some toys for Tom to play with in the waiting room.</i>  |
| 2. Transitional<br>(20 seconds) | There is a knock at the door                           | <i>Now Tom's mummy can go and see the dentist. She goes into the room next door to see the dentist.</i>   |
|                                 | Mother leaves baby alone.                              | <i>Tom has to wait by himself while his mummy is with the dentist.</i>  |
| 3. Separation<br>(60 seconds)   | Baby is in the waiting room alone                      |   |

### **3.3 Results**

Due to the large number of codes, functionally related behaviours were combined, as is typical of the literature (e.g., Rothbart, et al., 1992). This resulted in six categories of behaviour: (i) disengagement, comprising gaze avoidance, head avoidance and distraction; (ii) self-soothing behaviour; (iii) communicative bids; (iv) agitative activity, comprising gross and minor agitative activity; (v) expressions of worry-concern; (vi) expressions sadness, comprising facial and postural sadness.

Reliabilities and descriptive statistics for the six behavioural categories are presented first, followed by an examination of the relation between behavioural responses and the different vignette epochs. The relation between children's behavioural responses is then examined, with a specific focus on the relation between children's behaviours in the transitional epoch, and their subsequent responses in the separation epoch. Finally, the relation between children's behavioural responses and maternal ratings of children's social behaviours is explored.

#### **3.3.1 Reliabilities**

Two coders, one blind to the experimental hypotheses, were trained in reliability by independently scoring a random sample of 10 children, comprising 14% of the sample. Inter-coder reliability code was high, Cohen's  $\kappa$  for behavioural codes were as follows: disengagement  $\kappa = .77$ , self-soothing  $\kappa = 1.0$ , communicative bids  $\kappa = .98$ , agitative activity  $\kappa = .82$ , expressions of worry-concern  $\kappa = .79$ , and expressions of sadness  $\kappa = .87$ . These reliabilities are comparable to similar behavioural measures in the literature (e.g., Buss & Goldsmith, 1998; Diener & Mangelsdorf, 1999; Grolnick, et al., 1996). Discrepancies were resolved via discussion.

#### **3.3.2 Descriptive statistics**

Table 3.2 shows descriptive statistics for the six behaviours of interest across the whole vignette. There was a large amount of variation in the presence of these behaviours. Nevertheless, the majority of children responded to the vignette with at least some disengagement, agitative activity and communicative bids. Conversely, self-soothing behaviours, expressions of worry-concern, and expressions of sadness

were uncharacteristic of most children, but those children who did show such behaviours did so in a clear manner; as has been previously observed (Cole, et al., 1996).

Table 3.2

Mean duration (as a percentage), standard deviations, range, and percentage (%) of children displaying disengagement, self-soothing behaviours, communicative bids, agitative activity, worry-concern and sadness across the whole vignette

|                    | <i>Mean</i> | <i>SD</i> | <i>Range</i> | <i>%</i> |
|--------------------|-------------|-----------|--------------|----------|
| Disengagement      | 6.36        | 6.31      | 0 – 28.31    | 79.5     |
| Self-soothing      | 8.45        | 18.75     | 0 – 90.83    | 36.6     |
| Communicative bids | 5.55        | 7.34      | 0 – 31.17    | 68.5     |
| Agitative activity | 30.04       | 30.38     | 0 – 100      | 79.5     |
| Worry-concern      | 3.49        | 7.26      | 0 – 32.06    | 34.2     |
| Sadness            | 4.14        | 8.47      | 0 – 43.91    | 36.6     |

### 3.3.3 Behaviour by epoch

Mean duration (as a percentage) of each behavioural response was examined by epoch; neutral, transitional and separation (see Figures 3.1 to 3.6). Repeated measures ANOVAs were conducted for each behavioural response across the three epochs, including planned trend analysis contrasts to test for both linear and quadratic change across the epochs. A significant linear trend suggests that children's behaviours are increasing (or decreasing) across the neutral, transitional and separation epochs. A significant quadratic trend implies a change in the rate of increase (or decrease) across the three epochs.

Figure 3.1 shows the mean duration of disengagement for each epoch. There was a significant difference in children's use of disengagement across the three epochs,  $F(2, 144) = 56.12, p < 0.01$ . Both the linear and quadratic contrasts were significant,  $F(1, 72) = 68.12, p < 0.01$ , and  $F(1, 72) = 35.10, p < 0.01$ , respectively. When viewed together, these findings indicate disproportionately high disengagement in the separation epoch.

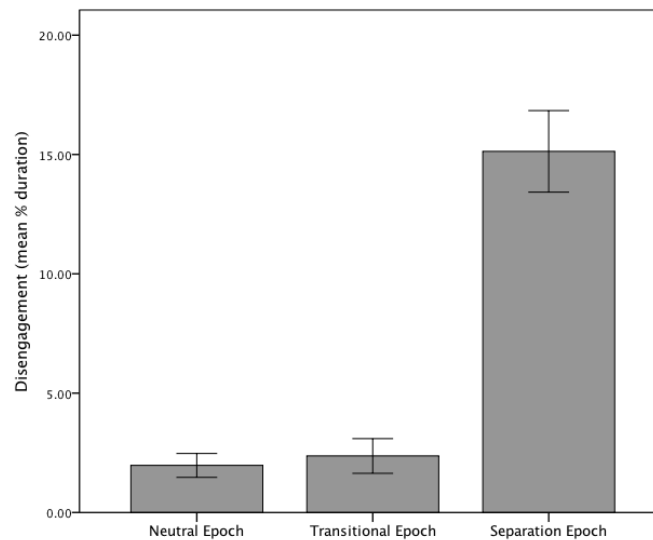


Figure 3.1. Mean percent duration of disengagement across the three vignette epochs (error bars represent 1 standard error)

Figure 3.2 shows mean levels of self-soothing behaviour for the three epochs. There was no significant difference by epoch,  $F(2, 144) = 0.52, p > 0.05$ . However, given the small percentage of children showing self-soothing behaviours across the vignette, caution is taken when interpreting this finding.

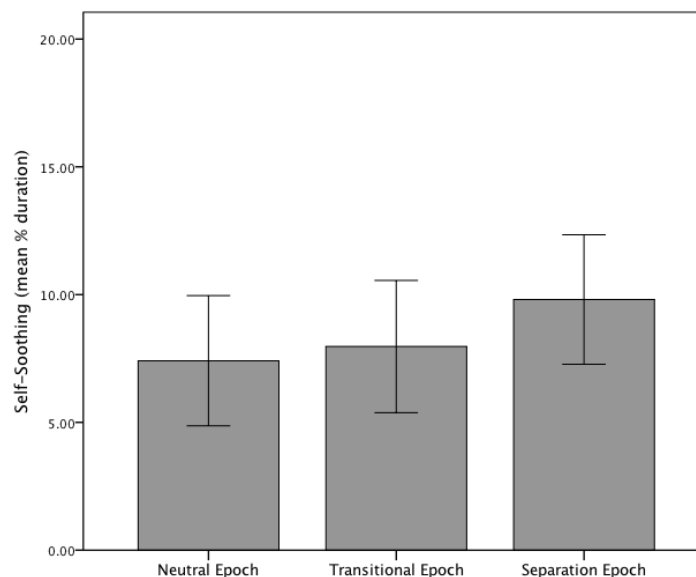


Figure 3.2. Mean percent duration of self-soothing behaviours across the three vignette epochs (error bars represent 1 standard error)

Figure 3.3 shows the mean duration of children's communicative bids across the three epochs. There was a significant difference in the duration of children's communicative bids across the epochs,  $F(2, 144) = 11.36, p < 0.01$ . Only the linear

contrast was significant,  $F(1, 72) = 20.74, p < 0.01$ , indicating that children made more communicative bids as the epochs progressed.

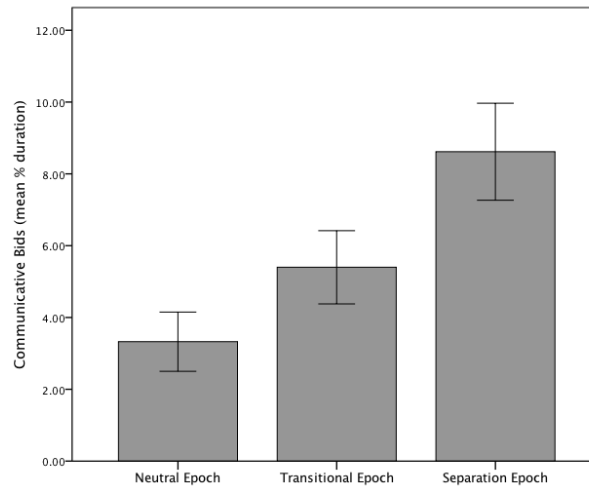


Figure 3.3. Mean percent duration of communicative bids across the three vignette epochs (error bars represent 1 standard error)

Figure 3.4 suggests that mean levels of agitative activity were largely consistent across epochs. However, there was a marginally significant effect by epoch,  $F(2, 144) = 2.99, p = 0.05$ . Follow-up analyses showed that there was no significant linear trend, but the quadratic trend was marginally significant,  $F(1, 72) = 3.61, p = 0.06$ , suggesting a change in the rate of change over the three epochs, which may be understood with reference to the drop in agitative activity in the separation epoch.

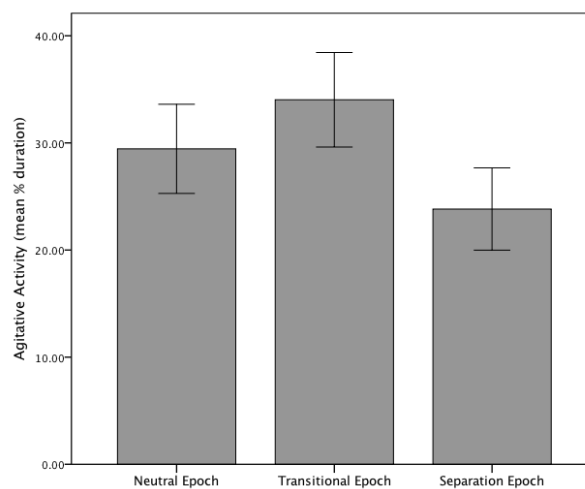


Figure 3.4. Mean percent duration of agitative activity across the three vignette epochs (error bars represent 1 standard error)

Figure 3.5 shows an increase in the mean duration of children's expressions of worry-concern across the three epochs. There was a significant difference in the experience of worry-concern across epochs,  $F(2, 144) = 3.55, p < 0.05$ . A significant linear trend,  $F(1, 72) = 6.87, p < 0.05$ , showed that children's expressions of worry-concern began to increase in the transitional epoch, and continued to increase with the protagonist's visible distress in the separation epoch, although the difference between these latter two epochs was not great. The quadratic trend was not significant.

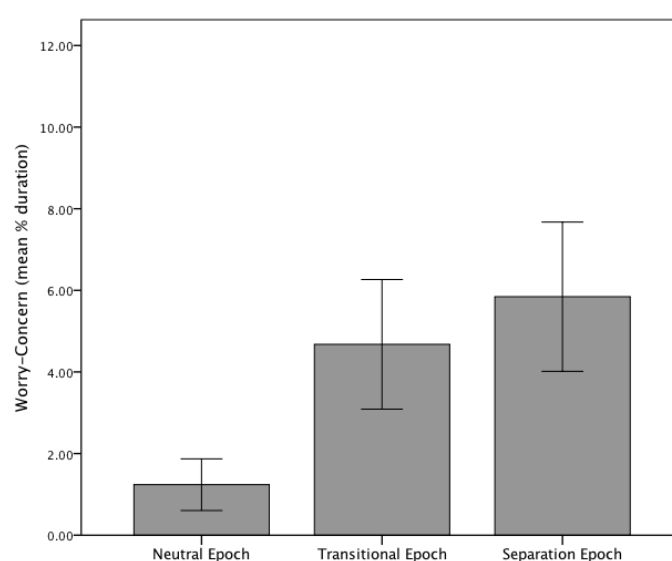


Figure 3.5. Mean percent duration of expressions of worry-concern across the three vignette epochs (error bars represent 1 standard error)

Figure 3.6 shows that the mean duration of sadness increased markedly across the three epochs. There was very little sadness during the neutral epoch. There was a significant mean difference in the expression of sadness across the three epochs,  $F(2, 144) = 11.79, p < 0.01$ . A significant linear trend showed that children's expressions of sadness increased steadily over the epochs; there was clearly more sadness in the final, emotional, epoch,  $F(1, 72) = 18.07, p < 0.01$ . The quadratic trend was not significant.

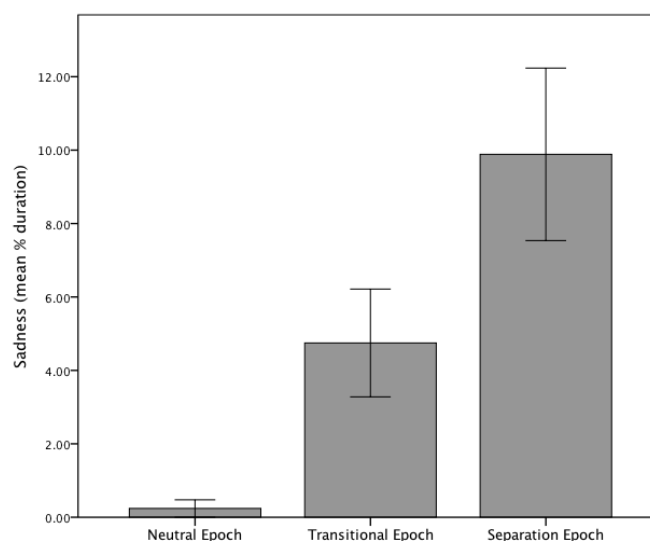


Figure 3.6. Mean percent duration of expressions of sadness across the three vignette epochs (error bars represent 1 standard error)

### **Summary: Epoch Analysis**

An analysis of behaviour by epoch suggests that children's responses to the vignette are meaningfully related to the vignette content and the emotion expressed therein. As the infant appreciated his mother's departure and his emotional distress increased, there was a corresponding increase in the use of disengagement and communicative bids. Furthermore, children's expressions of worry-concern and sadness were also meaningfully related to the content of the vignette. Although both worry-concern and sadness increased across the transitional and separation epochs, they showed a somewhat different pattern of change; whereas worry-concern changed very little between the transitional and the separation epoch, children's sadness (when expressed) continued to escalate sharply. It should be noted that expressions of worry-concern and sadness were only seen in approximately one-third of children (see Table 3.2), so it is important to consider these patterns of findings in this context and also establish to what extent these expressions co-occurred in children (see below).

Examination of behavioural changes across epochs provides evidence that the presence of disengagement and communicative bids, and expressions of both worry-concern and sadness, occur in response to the specific content of the vignette. In contrast, agitative activity and self-soothing behaviours were mostly unrelated to the vignette content; that is, rates of these behaviours did not differ across the

neutral, transitional and separation epochs, suggesting that these behaviours are more stable individual response patterns. The following analyses examine the stability of behavioural responses across epochs.

### 3.3.4 Stability of behavioural responses

Despite significant differences in the presence of many behavioural responses between epochs, such behaviours may still tap relatively stable individual differences between children. In this section, stability in behavioural responding is examined for each behaviour. As approximately only one-third of children were observed to engage in self-soothing behaviours, expressions of worry-concern, and expressions of sadness, stability in these behaviours was examined as present or absent (i.e., dichotomously) using Chi-square analyses.

Disengagement in the neutral epoch was significantly correlated with disengagement in the transitional and separation epochs,  $r$ s of .37 and .48 respectively,  $p$ s < 0.01. However disengagement was not significantly correlated across the transitional and separation epochs,  $r = .17$ ,  $ns$ . It is important to note that the amount of disengagement seen in the separation epoch far outstripped the previous two epochs, so these comparisons need to be viewed with caution.

Communicative bids were significantly correlated across all three epochs,  $r$ s between .27 and .63,  $p$ s < 0.05, suggesting that this is a relatively stable behavioural characteristic of children.

Agitative activity was significantly correlated across all three epochs,  $r$ s between .35 and .59,  $p$  < 0.01, suggesting that this is a relatively stable behavioural characteristic of children.

There was consistency in children's use of self-soothing behaviours between the neutral and transitional epochs,  $\chi^2_1(N = 73) = 18.58$ ,  $p < 0.01$ , and between the neutral and separation epochs,  $\chi^2_1(N = 73) = 8.27$ ,  $p < 0.01$ . Stability between the transitional and separation epochs was marginally significant,  $\chi^2_1(N = 73) = 3.56$ ,  $p = 0.06$ .

Due to the small number of children expressing either worry-concern or sadness in the neutral epoch (one and five children, respectively), only the stability between the transitional and separation epochs is examined. There was a non-

significant relation between worry-concern in the transitional and separation epoch,  $\chi^2_1(N = 73) = 1.58, ns$ . In contrast, children were more likely to express sadness in the separation epoch if they had done so during the transitional epoch,  $\chi^2_1(N = 73) = 7.74, p < 0.01$ . Both of these findings, however, need to be viewed in light of the low frequency of worry-concern ( $n = 11$ ) and sadness ( $n = 14$ ) in the transitional epochs.

**Summary: Stability of behavioural responses**

Overall, the stability of specific behaviours between epochs was impressive, particularly considering the extent of individual differences and the fact that the procedure comprises a single observational window on the child. As predicted, agitative activity and self-soothing behaviours were stable characteristics of the child. Children's communicative bids were also stable across the three epochs. In contrast, individual differences in children's use of disengagement was not stable across the three epochs, but this findings needs to be tempered by the fact that very little disengagement was seen in the preliminary epochs. Finally, individual differences in expressions of sadness were consistent, if increasing, across the transitional and separation epochs, while expressions of worry-concern were not. The following analyses examine the relations between different behavioural responses.

**3.3.5 Relations between behaviours**

Table 3.3 shows that the total duration of children's behavioural and expressive responses summed across the three epochs of the infant-mother separation vignette were, for the most part, unrelated. Only disengagement was significantly, positively, correlated with communicative bids, suggesting that those children more likely to disengage from the vignette were also more likely to make communicative bids. This is perhaps unsurprising as communicative bids also often involve disengagement from the stimuli, but, given the number of correlations considered in this table, it is unwise to over-interpret a single significant finding in the absence of an a priori hypothesis; at least one significant correlation would be expected by chance and the strength of the correlation is modest. There were no significant correlations between children's behavioural responses and sex. Thus, what is notable about the findings presented in Table 3.3 is the independence of

children's behavioural response domains. Furthermore, there was no relation between any of the six behavioural responses when examined within epoch, providing further evidence of the independence of these responses.

Table 3.3

Bivariate correlations for children's sex, total disengagement, self-soothing, communicative bids, agitative activity, worry-concern and sadness across the three vignette epochs

|                       | 1 | 2   | 3    | 4    | 5    | 6    | 7    |
|-----------------------|---|-----|------|------|------|------|------|
| 1. Sex                | – | .12 | .02  | .10  | .06  | -.04 | .07  |
| 2. Disengagement      |   | –   | -.01 | .30* | -.01 | -.02 | -.02 |
| 3. Self-soothing      |   |     | –    | -.05 | -.07 | .01  | .09  |
| 4. Communicative bids |   |     |      | –    | -.01 | -.10 | -.08 |
| 5. Agitative activity |   |     |      |      | –    | -.06 | -.04 |
| 6. Worry-concern      |   |     |      |      |      | –    | -.05 |
| 7. Sadness            |   |     |      |      |      |      | –    |

\* $p < 0.05$ .

Correlations between children's behavioural responses in the transitional epoch and the separation epoch were examined to explore predictive relations between behaviours. Given the relatively low incidence of behavioural responses observed in neutral epoch, these initial behaviours are not given further consideration.

Table 3.4 shows that, as noted in Section 3.3.4, there was robust stability within behaviours across epochs (see diagonal). By contrast, examination of different behaviours across epoch showed remarkable independence between behavioural domains. Only self-soothing behaviours in the transitional epoch were significantly correlated with sadness in the separation epoch, such that higher levels of self-soothing predicted sadness. There reverse relation was not found.

Table 3.4  
Cross-epoch bivariate correlations between behavioural responses to the emotional vignette

|                    |                    | Separation Epoch |               |                    |                    |               | Sadness |
|--------------------|--------------------|------------------|---------------|--------------------|--------------------|---------------|---------|
|                    |                    | Disengage.       | Self-soothing | Communicative bids | Agitative activity | Worry-concern |         |
| Transitional Epoch | Disengagement      | .17              | -.12          | .17                | -.07               | .01           | .16     |
|                    | Self-soothing      | .01              | .45**         | -.11               | .11                | -.08          | .35**   |
|                    | Communicative bids | .13              | .07           | .63**              | -.11               | -.18          | .12     |
|                    | Agitative activity | -.01             | .06           | .10                | .35**              | .04           | -.17    |
|                    | Worry-concern      | .02              | .09           | .02                | -.10               | .20           | .10     |
|                    | Sadness            | -.03             | -.05          | -.15               | .10                | -.03          | .40**   |

\* $p < 0.05$ , \*\*  $p < 0.01$ .

To further explore associations between children's affective expressions (worry-concern and sadness) and other behavioural responses, children were categorised into one of three affect groups based on the dominant affect expressed in the separation epoch, as outlined in Cole et al. (1996)<sup>2</sup>. These classifications were: *Inexpressive*, children who showed neither sadness nor worry-concern; *Worry-concern*, those children who displayed primarily worry-concern; and *Sad*, those children expressing facial or postural sadness. To be classified as worry-concern or sad, children needed to display the relevant affect for more than 2 seconds, so that transitory expressions were not determining affect categorisation. There were three children classified as inexpressive who displayed worry-concern for less than 2 seconds. All children expressing sadness did so for more than 2 seconds. Children's responses in the separation epoch served as the basis for their affect group categorisation for theoretical and empirical reasons. Theoretically, the rationale for classification was driven by the empathy literature, so that children's responses to the protagonist's distress was of primary interest. Empirically, the final epoch elicited higher levels of both worry-concern and sadness in more children. It is also

<sup>2</sup>Thanks to P. Cole for her input and guidance in the coding and categorisation of children's affective responses.

noteworthy that children's expressions of worry-concern were not highly stable across epochs.

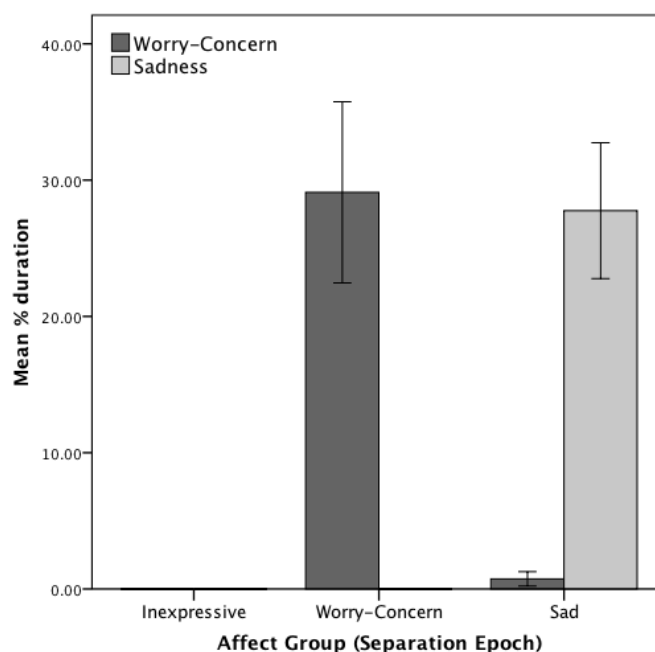


Figure 3.7. Mean duration of worry-concern and sadness in the separation epoch by affect group (error bars represent 1 standard error)

The classification of children into inexpressive, worry-concern and sad affect groups resulted in profoundly distinct groups (see Figure 3.7). Only two children showed expressions of both worry-concern and sadness during the separation epoch; however in these cases they clearly expressed greater sadness compared to worry-concern. Thirty-three children were classified inexpressive, 14 children were classified worry-concern, and 26 children were classified sad. Affect classification was unrelated to sex,  $\chi^2_2(N = 73) = .061, ns$ , although there was a trend for boys to be more inexpressive, while girls were likely to express worry-concern. Children's behavioural responses to the separation epoch were examined as a function of affect group. Table 3.5 shows that the worry-concern group had the highest level of disengagement but the lowest level of communicative bids. Differences in agitative activity between groups were relatively small given the prevalence of these behaviours. Despite these large mean differences for disengagement and communicative bids, there were no significant differences in behavioural responding for affect groups, nor was there a significant relation between self-soothing

behaviour (as a dichotomous variable) and affect group,  $\chi^2_2(N=73) = .30, ns$ . This result further emphasises the extent of individual differences in children's behavioural responding.

Table 3.5

Means (SD) of disengagement, self-soothing, communicative bids and agitative activity in the separation epoch by affect group and ANOVA F value

|                     |                       | Affect Group             |                            |                  | F-value |
|---------------------|-----------------------|--------------------------|----------------------------|------------------|---------|
|                     |                       | Inexpressive<br>(n = 33) | Worry-concern<br>(n = 14 ) | Sad<br>(n = 26)  |         |
| Separation<br>Epoch | Disengagement         | 13.97<br>(16.96)         | 19.06<br>(12.81)           | 14.48<br>(12.21) | .63     |
|                     | Communicative<br>bids | 8.82<br>(11.90)          | 5.11<br>(9.02)             | 10.25<br>(12.28) | .91     |
|                     | Agitative activity    | 36.21<br>(38.96)         | 33.11<br>(39.91)           | 31.76<br>(36.24) | .10     |

### **Summary: Relations between behavioural responses**

There was a single significant correlation between children's disengagement, communicative bids and activity level at the level of overall behaviour, inter-epoch and intra-epoch analyses. Furthermore, although mean differences in behavioural responses by affect group suggested that children expressing worry-concern showed the greatest disengagement, and the lowest level of communicative bids, these differences were not significant. The only significant association of note between behavioural domains was the predictive association between self-soothing in the transitional epoch and sadness in the separation epoch. While this relation fits with the conceptualisation of self-soothing behaviour as a manifestation of emotion regulation (i.e., elevated self-soothing in the transitional epoch was associated with higher levels of expressed sadness in the separation epoch), it is remarkable in its uniqueness and needs to be treated with caution because so few children at this age used self-soothing behaviours. Overall, then, examination of relations between behavioural domains showed stunning independence.

### **3.3.6 Behavioural responses and social behaviours**

Table 3.6 shows the correlations between children's disengagement, communicative bids and agitative activity, and maternally rated social behaviours. Communicative bids and agitative activity were unrelated to children's maternally-

rated problem and prosocial behaviours. To examine differences in social conduct as a function of children's use of self-soothing behaviours, a dichotomous variable was used. An ANOVA suggests that there were no mean differences in social conduct as a function of their self-soothing behaviours,  $F_s$  between .37 and .62, *ns*.

Disengagement, however, was significantly positively correlated with both maternally-rated emotional and peer problems, suggesting that higher levels of disengagement from the emotional stimuli (in the separation epoch) corresponded to increased emotional and peer problems. Disengagement was also significantly negatively correlated with prosocial behaviours, such that less disengagement during the separation epoch was related to higher prosocial ratings. To test for the specificity of the relation between disengagement during the separation epoch and social behaviours, correlations between disengagement in the transitional epoch and maternal SDQ ratings were examined. Only the relation between disengagement and emotional problems remained when disengagement was assessed in the transitional epoch,  $r = .30$ ,  $p < 0.05$ , confirming the salience of the separation epoch.

Finally, a series of ANOVAs were conducted to examine the relation between affect group and children's social behaviours. There were no significant differences in children's emotional problems, conduct problems, hyperactivity or peer problems, by affect group ( $F_s$  between .40 and 1.60, *ns*). Regarding prosocial behaviours, sad children had the highest scores, but this difference was non significant,  $F(2, 70) = 1.56$ , *ns*.

Table 3.6  
Bivariate relations between behavioural responses in the separation epoch and SDQ scales

|                  |                    | SDQ Scales         |                  |               |               |                     |
|------------------|--------------------|--------------------|------------------|---------------|---------------|---------------------|
|                  |                    | Emotional problems | Conduct problems | Hyperactivity | Peer problems | Prosocial behaviour |
| Separation Epoch | Disengagement      | .29*               | .09              | .06           | .26*          | -.27*               |
|                  | Self-soothing      | -.01               | -.03             | -.05          | .02           | -.03                |
|                  | Communicative bids | .10                | .18              | .13           | -.14          | -.12                |
|                  | Agitative activity | .09                | -.15             | .04           | -.12          | .07                 |
|                  | Worry-concern      | -.13               | -.05             | -.22          | .04           | -.12                |
|                  | Sadness            | -.15               | -.10             | -.02          | .05           | .16                 |

\* $p < 0.05$ .

### **Summary: Behavioural responses and social behaviours**

Disengagement was the only behavioural response significantly associated with maternal ratings of children's social behaviours. Greater disengagement in the context of infant distress was associated with emotional and peer problems, and less prosocial behaviour, although these relations were modest. Furthermore, unexpectedly there was no significant relation between children's agitative activity and their maternally rated hyperactivity.

### **3.4 Discussion**

Although the behavioural responses of infants, toddlers and preschoolers to emotional events have been given consideration in the emotion regulation literature, there is considerably less research examining such responses at the time children are beginning school. The current study investigated the behavioural and affective responses enacted by children when faced with an emotionally challenging event shortly before school entry. The first aim of the study was to examine the type and frequency of each behavioural and affective response to the emotionally evocative vignette, and determine whether these responses could be reliably scored. As expected, some behaviours occurred more frequently than others, or were displayed by a greater proportion of children. Furthermore, these responses were reliably scored, with a high level of agreement for all responses across the two

trained coders. Disengagement, communicative bids and agitative activity were observed in a large proportion of children. In contrast, self-soothing behaviours, expressions of worry-concern and expressions of sadness were observed in a smaller proportion of children. When viewed in light of the wider literature, these findings are consistent. Specifically, low levels of self-soothing behaviours would be expected as children mature (Gilliom, et al., 2002), and previous findings strongly suggest that children can be categorised into affective groups on the basis of a dominant affective response to emotional content, or lack thereof (e.g., Cole, et al., 1996).

The second aim of the study was to examine the relationship between the events (epochs) of the vignette and children's behavioural responses. As predicted, with the exception of self-soothing behaviours and agitative activity, children's behavioural responses were in keeping with the changing content of the vignette epochs. Globally, the prevalence of specific behaviours previously related to emotionally challenging events in the literature changed in systematic ways when the vignette protagonist displayed distress during the separation epoch. Thus, children were more likely to use disengagement, make communicative bids, and express both worry-concern and sadness when the vignette depicted the protagonist in distress during the separation epoch.

However, not all behavioural responses appeared contingent on the content of the vignette. Children's agitative activity and self-soothing behaviours were not related to the events in the separation vignette. That is, self-soothing behaviours and agitative activity were observed at a consistent level across the neutral, transitional and separation epochs. Children's use of self-soothing behaviours and agitative activity may, therefore, be better understood as stable individual characteristics of children rather than responses provoked in specific situational contexts. This interpretation is consistent with the literature examining children's activity in challenging and non-challenging settings, as a more general feature of behaviour (e.g., Mullin & Hinshaw, 2007) and, furthermore, is suggestive of specific temperamental modes of behavioural responding.

The specific pattern of responses across the three epochs of the vignette provides support for the effectiveness of the video vignette paradigm and, more

specifically, the use of a mother-infant separation situation as a means to elicit vicarious emotional responding and behavioural responses in children shortly before school entry. It is important to keep in mind, however, that these response patterns are averaged across children. It is possible, indeed plausible, that grouping variables such as attachment status may reveal different patterns of behaviour by epoch. This type of analysis, however, was beyond the scope of this thesis (but see Calkins & Johnson, 1998; Kochanska, 2001; Silk, Shaw, Skuban, Oland, & Kovacs, 2006). Instead, the current chapter sought to examine regularities in typical children's responses across the different vignette epochs. Thus, a conventional interpretation of the current findings is that with increased arousal, indexed by greater worry-concern and sadness, children enact behavioural strategies in an attempt to modulate their affect; that is, to regulate their emotion. Hence, increased disengagement from the distressing stimuli and a higher incidence of communicative bids were observed during the distressing separation epoch of the vignette. The extant literature has also shown that children's behaviours are contingent on the content of different emotionally challenging events, whether elicited directly (e.g., Diener & Mangelsdorf, 1999) or vicariously (e.g., Eisenberg, Fabes, et al., 1988), and the present study contributes to this literature. Against the conventional interpretation of the current results, however, is the impressive stability of behavioural responses within children and the remarkable independence of behavioural responses across children. Thus, it is not correct to say of the current data, for example, that increased worry-concern precipitated greater disengagement. Rather, these two behavioural responses were independent and should be understood as such. I address these features of the current findings in more detail below, and return at the conclusion of this discussion to the role and function of specific behaviours.

### ***Stability and independence of behavioural responses***

Although children clearly exhibited a distinct pattern of responding that was contingent on the content of the neutral, transitional and separation epochs, there was also considerable stability in responses across these epochs. As expected, there was stability in children's self-soothing and agitative activity, lending support for the

hypothesis that these behaviours are indicative of children's more general behavioural responses as opposed to a specific response elicited by a challenging event. Furthermore, despite the low frequency of communicative bids in the neutral and transitional epochs, this response was related across all epochs, suggesting that some children were more inclined to seek comfort or information with communicative bids, regardless of the intensity of the challenging content; although they were much more likely to do so when there was an escalation in the distress of the vignette protagonist. There was less consistency in children's use of disengagement across the epochs, a finding that may be due to the small amount of disengagement in the neutral and transitional epochs. Further research on the consistency of disengagement across different challenging events is needed to interpret this result. The stability in children's responses is particularly impressive when considering how different the content of these three epochs were, in addition to the fact that the epochs themselves were relatively short. The overall stability of children's behavioural responses across the three different epochs provides evidence that specific responses are more likely to be observed in some children, regardless of eliciting context.

Examining the stability of affective responses across the three epochs revealed that there was no cross epoch consistency in children's worry-concern expressions. Children who expressed worry-concern during the transitional epoch were not more likely to express worry-concern during the separation epoch. Conversely, expressions of sadness were stable across the vignette epochs. Children who expressed sadness during the neutral and transitional epochs were also more likely to express sadness during the separation epoch. However, these findings must be viewed in light of the small number of children expressing worry-concern or sadness in the transitional epoch. Nevertheless, there were differences in the patterns of elicitation between expressions of worry-concern and expressions of sadness. Children's expressions of worry-concern increased sharply from the neutral to the transitional epoch, whereas expressions of sadness rose more steadily across the three epochs. An examination of the content of the three epochs may help explain this different pattern. The transitional epoch comprised an ambiguous

situation and depicted an event foreboding later distress in the infant protagonist. By contrast, in the separation epoch, the infant protagonist is clearly in distress and, thus, this epoch is likely to be more emotionally arousing. Overall, these findings suggest that expressions of worry-concern are likely to be elicited during the period of uncertainty (i.e., the transitional epoch) or the anticipation of distress, while expressions of sadness are likely in response to the manifest distress of another (i.e., the separation epoch). Furthermore, given the lack of stability in expressions of worry-concern, it may be that expressions of worry-concern elicited by observing the distress of another are unrelated to the expression of worry-concern in anticipation of another's distress.

In addition to the stability of children's behavioural and affective responses to the vignette epochs, the relation between different types of responses was also examined. While there was robust stability of specific behaviours, despite the limited length of the eliciting vignette and the changing nature of the epochs, there were virtually no associations between different behavioural domains over the entire vignette or within individual epochs. Furthermore, there was little evidence that certain behaviours in the separation epoch (e.g., sadness, disengagement, etc.) were contingent on other domains of behavioural responding in the earlier transitional epoch; the different domains of children's emotional responding were remarkably independent. The independent nature of children's behavioural responses has been demonstrated by Buss and Goldsmith (1998), who found that the regulatory behaviours enacted by infants when faced with fear and anger inducing events were independent.

In the current study, expressions of worry-concern and expressions of sadness, in particular, were remarkably distinct. When children were categorised on the basis of their predominant expression, very few children expressed both worry-concern and sadness. First, this finding suggests worry-concern and sadness are discrete expressions that characterise children's responses when they are faced with challenging events. Second, from a methodological standpoint, the discrete nature of worry-concern and sadness suggests that these expressions were discriminated during coding. The distinctive nature of children's expression of worry-concern and

expressions sadness is not always evident in the literature (e.g., Eisenberg, McCreath, et al., 1988), although the discrete nature of these expressions has been reported by others (e.g., Cole, et al., 1996). As outlined in Chapter 2, both expressions of worry-concern and expressions of sadness have been conceptualised as affective empathy. While the current findings need replication given the uncertainty surrounding the meaning of these behaviours in the literature, the interim conclusion must be that they represent distinctive response modes.

***Behavioural responses and social adaptation***

Finally, the present study examined the relation between children's behavioural responses and maternally rated social behaviours. Only disengagement was related to children's social behaviour. Children who were observed to use less disengagement during the separation epoch were rated by their mothers as more prosocial and as having fewer behavioural problems. This finding strongly reiterates the current literature on the importance of attentional control in children's social competencies (Cortez & Bugental, 1994; Eisenberg, Fabes, Guthrie, et al., 1996; Gurthrie, et al., 1997). It is important to note, however, that disengagement was most robustly related to social behaviours when it was assessed in the most challenging epoch; implying that disengagement during that transitional epoch is not an optimal source of information on children regulatory skills. The importance of the eliciting context for children's disengagement behaviours was also found by Cortez and Bugental (1994). They found that disengagement during a negative event was related to social functioning, but there was no relation between disengagement during a neutral or positive event and children's social adaptation. Together, these finding suggest that in order to understand the relevance of behavioural responses to children's social behaviours, it is important to examine the emotionally evocative context in which these behaviours are elicited.

Self-soothing, communicative bids, and agitative activity showed no relation to children's social behaviours as rated by mothers. The lack of relation between children's agitative activity and their hyperactivity, in particular, is surprising given the stability of children's agitation across the three epochs of the vignette. However, maternal ratings may be problematic as mothers may not have an understanding of

the extent of their child's behavioural problems relative to other children. Another possible reason for the lack of relation between children's agitative activity and their hyperactivity more generally, is the manner in which agitative activity was scored. In the current study, agitative activity comprised of large body movements, as well as small localised agitative movements such as fidgeting and facial grimaces. It may be the case that these different manifestations of children's agitative activity have distinctive patterns of relations with hyperactivity specifically, and problem behaviours more generally. Further investigation is needed to unpack the relation between different modes of agitative activity during challenging events and children's hyperactivity or impulsivity. An exploration of this issue will be carried out in Chapter 4.

Children's communicative bids during emotional distress has been conceptualised as a regulatory strategy that assists the child to understand the emotional content of the vignette and/or obtain reassurance from the caregiver or experimenter. In the current study, children's communicative bids included verbalisations, however, no distinction was made between verbalisations that were relevant and irrelevant to the vignette. It is possible that bids for further information, such as questions regarding the content of the vignette or comments made by the child that centre on their understanding of the vignette, will be specifically related to children's social competence, as opposed to comments unrelated to the vignette content. In Chapter 4, children's verbal communicative bids will be coded for content so that the relation between different types of verbal bids and social behaviours may be explored.

Surprisingly, there were no differences in social behaviours by children's affective response to the separation epoch. Numerous studies have found a relation between children's expressions of worry-concern or sadness and their prosocial and problem behaviours (e.g., Eisenberg & Fabes, 1990; Eisenberg, et al., 1989; Eisenberg, McCreath, et al., 1988; Fabes, et al., 1990; Hastings, et al., 2000; Strayer & Roberts, 2004a; Zahn-Waxler, et al., 1992). An examination of the mean difference in children's prosocial behaviours by their affect group suggests that children expressing sadness were rated by their mothers as showing the most prosocial

behaviours, however, this difference was not significant. Nevertheless, the number of children expressing worry-concern and sadness was small in the current study and this findings should be substantiated using a larger sample size.

Overall, the lack of relations between children's behavioural responses to the emotional vignette and their maternally rated social behaviours may be due to a potential bias in parent reports of children's socially competent and problem behaviours (Renk & Phares, 2004). In order to overcome this limitation, a similar investigation is needed in which children's behaviours, relative to their peers, can be properly assessed, such as during the year children's transition to school. Teachers, in particular, may potentially provide a more reliable account of children's social and problem behaviours given their experience with a broad range of children and their understanding of typical development. Furthermore, peers are also able to provide an accurate account of children's social functioning and may even provide an insight into social relations that are not observed by teachers (Coie & Dodge, 1988; Hay, Payne, & Chadwick, 2004; Ladd, 1999).

A limitation of the current study, and more broadly the emotion regulation literature that employs such emotion elicitation paradigms, is that the vignette paradigm does not take into account children's own past emotional experiences. As outlined in Chapter 1, children's responses to an emotional challenge may be determined in part by their emotional history. As a result, some children may be more reactive to specific emotional events than other due to their own emotional experiences. In the current study, responses were averaged across children, differences in children's response patterns may emerge with the introduction of grouping variables. For example, given the content of the emotion eliciting vignette employed in the current study, children's attachment style may be a particularly relevant construct to examine different patterns in behavioural and affective responses across the three epochs. In the following section of the discussion, an interpretation of different behavioural and affective responses is proposed.

#### ***The meaning of children's behavioural and affective responses***

The detailed examination of children's behavioural and affective responses undertaken in the current chapter helps to elucidate the possible meaning of these

responses when examined within an emotion regulation and empathy framework. The increased incidence of disengagement and communicative bids during the separation epoch of the vignette provides support for these behavioural responses as ones elicited by challenging events. Furthermore, the current findings, in addition to the extant literature (e.g., Buss & Goldsmith, 1998; Eisenberg, Fabes, Murphy, et al., 1996; Kopp, 1989), suggest that disengagement and communicative bids are strategies employed by children to manage their arousal. In contrast, agitative activity and self-soothing behaviours did not appear to be utilised by children as a strategy to modulate arousal, as they were observed in children consistently across the different epochs. Because these latter behaviours were not elicited by specific contexts, it is entirely plausible that they are best described as a stable temperamental characteristic of the child. This is not to say that disengagement and affect are not indications of temperamental characteristics, but it is certainly clear that these behaviours are also highly contextually bound.

Examining the relation between disengagement and children's social conduct lends further support for the proposition that this behaviour is a meaningful response enacted by children when faced with challenging events. The association between disengagement and social conduct suggests that those children who disengaged *least* from the separation epoch of the challenging vignette were more socially competent and had fewer problem behaviours. Taken together, these findings suggest that disengagement is a regulatory strategy employed by children to deal with over-arousing events, and that those children who rely less on disengagement, presumably because they are less aroused by the specific event, are likely to be socially well-adapted. Thus, as expected from the literature, the manner in which children modulate their attention to challenging events has reaching implications for their social functioning (Cortez & Bugental, 1994; Eisenberg, Fabes, Guthrie, et al., 1996, Guthrie, et al., 1997). There were no such associations between communicative bids or any other behavioural response and social adaptation.

As outlined above, the expression of worry-concern and the expression of sadness were independent. Furthermore, they had different patterns of elicitation across the three epochs, expressions of worry-concern increased sharply during the

anticipation of the vignette protagonist's distress (i.e., transitional epoch), whereas sadness increased most markedly during the protagonist's observed distress (i.e., separation epoch). These different patterns of responding, along with the relative independence of these affective expressions, suggest that worry-concern and sadness are distinct responses to challenging situations. When these responses have previously been examined within an empathy framework, both have, at different times and in different contexts, been conceived as indicative of empathy, and both have been associated with children's social functioning. In the current study, when examining the relation between worry-concern and sadness during the empathy eliciting epoch (i.e., separation epoch), only expressions of sadness showed a relation to more adaptive social functioning, albeit, non-significantly. Tentatively, based on these findings, affective empathy appears to be most closely aligned with the expression of sadness rather than worry-concern. Of course, follow-up research is required to confirm this interpretation. However, expressions of sadness as indicative of affective empathy is consistent with the work of Strayer and Roberts (Roberts & Strayer, 1996; 1997) and Eisenberg et al. (1988).

Given the close conceptual association that is proposed between emotion regulation and empathy (Eisenberg & Fabes, 1992; Harris, 1989; Hoffman, 1982), an examination of the relation between affective expressions and behavioural regulation strategies may also help clarify the meaning of these expressions. Eisenberg and Fabes (1992) have argued that that emotion regulation and empathy are closely related constructs, and based on their line of reasoning it was expected that children showing more adaptive behavioural regulation (i.e., less disengagement) would also be more likely to express affective empathy (i.e., sadness). In the current study, there was some suggestion that children expressing higher levels of worry-concern compared to expressions of sadness were more likely to engage in high levels of disengagement but this difference was not significant (see Table 3.5). From this association, one can be speculate that children's expressions of worry-concern may be indicative of over-arousal, anxiety or apprehension. Clearly, further research is needed to clarify the meaning of worry-concern and sadness

during an empathy inducing situation, and their association to both emotionally well-regulated responding and social competence.

### **3.5 Conclusions and Rationale for Chapters 4 – 9**

Overall, the current study found that most children tend to respond to emotionally challenging events with disengagement, communicative bids and agitative activity, fewer children responded with self-soothing behaviours and expressions of worry-concern and negative affect. However, with the exception of self-soothing behaviours and agitative activity, children's behavioural responses were meaningfully related to the content of the emotionally evocative vignette. While behaviours were stable across epochs, they were relatively independent. Finally, only children's disengagement, specifically in the separation epoch, was related to their social behaviour, including both problem and prosocial behaviours, suggesting that less disengagement during the emotionally challenging event corresponds to better emotion regulation.

The findings presented in the current chapter suggest that the presentation of an emotional vignette is a successful means to elicit behavioural and affective responses in children at the time of school entry. Furthermore, many of the behaviours of interest in the current study appeared to be meaningfully related to the emotional content of the vignette, suggesting their specific role in emotional arousal and regulation. Finally, disengagement was related to maternally rated social conduct, implying an association between children's behavioural responses to a specific emotional vignette and their broader social adaptation. On the basis of these findings, the remaining empirical Chapters (Chapters 4 – 9) present a longitudinal study of children's regulatory and affective responses to a series of emotional events using both a similar paradigm to elicit emotion and a similar behavioural coding scheme (as presented in the current chapter).

A longitudinal approach to the study of the individual differences in children's emotion regulation allows the examination of the relation between behavioural responses and their children's social adaptation, both concurrently and longitudinally. In Chapter 4, the analysis expands on those presented in the current chapter. Children's behavioural responses to a series of emotionally evocative events

are examined, and the relation between such responses and children's concurrent social behaviour is considered at Time 1, when children are in their first year of formal schooling. Chapter 5 introduces heart rate variability as a physiological index of emotion regulation and empathy, with a particular focus on the relation between children's heart rate variability and their expressions of worry-concern and sadness. In Chapter 6, the relation between children's emotion regulation and their understanding of mind and emotion is explored, and furthermore, the simultaneous influence of emotion regulation and understanding of mind and emotion on social adaptation is examined.

Chapters 7, 8 and 9 focus on the longitudinal relations between children's behavioural response to challenging events and their social adaptation. Specifically, Chapter 7 examines the consistency and stability of behavioural and affective responses from Time 1 to Time 2. In Chapter 8, children's responses to emotionally challenging events are examined as concurrent and longitudinal predictors of social adaptation, as rated by both teachers and peers. In the final empirical chapter, children's behavioural and affective responses, in addition to their understanding of mind and emotion at Time 1, are examined as predictors of Time 2 social adaptation.

Based on the findings of the current chapter, a series of predictions are made regarding children's behavioural responses:

- (i) Less disengagement during challenging events (within the comprehension of the young child) will be related to adaptive social functioning
- (ii) Sadness will be more evident in an empathy vignette, whereas worry-concern will be evident in any emotionally evocative vignette
- (iii) Worry-concern (if it is linked with anxiety) should 'anticipate' distress, whereas sadness (if it is empathy) should be a response to distress
- (iv) Worry-concern and sadness are characteristic of individual children's response to a challenging event and, as such, should be independent
- (v) The presence of worry-concern, in a larger sample, should be related to children's disengagement, such that more worry-concern is associated with higher levels of disengagement

## Chapter Four

### Emotion elicitation across multiple contexts

#### 4.1 Introduction and aims

In Chapter 3 it was shown that children's behavioural responses to an emotionally evocative event were meaningfully related to the transitional and separation events of the vignette. Despite children's different response patterns to changing events and emotional content, individual differences in behaviour were relatively stable across the entirety of the vignette, including the non-emotional epoch. In fact, these initial data suggest that individual children have very distinctive response patterns. Furthermore, there was some suggestion, based on maternal report, that higher levels of disengagement during an emotionally challenging event were associated with less socially adaptive behavioural patterns.

The current chapter aims to substantiate and expand upon the results presented in Chapter 3. First, this study introduces a new emotion elicitation paradigm consisting of a series of emotionally challenging vignettes. Behavioural responses to a number of different emotionally evocative narratives are assessed in order to examine stability and change across different emotional contexts. In particular, vignettes were chosen that should, on theoretical grounds, enable differential predictions for the occurrence of specific behaviours. Second, additions and modifications were made to the behavioural coding scheme to better unpack the different responses that make up children's agitative activity and allow a closer examination of the verbal content of children's communicative bids. Third, in order to more confidently compare differences in behavioural responses across children expressing worry-concern and sadness, the sample was increased. This was necessary because the findings of Chapter 3 strongly suggested that expressions of worry-concern and sadness (and inexpressivity) differentiate children quite strongly. Finally, teacher rated measures of children's social adaptation were used in place of maternal ratings. Teachers may provide more sensitive and accurate ratings of children's social and problem behaviours as they have a wider range of experience

with children compared to parents. Furthermore, it was of primary interest to examine children's social adaptation to the school environment.

The current study presents a series of emotionally evocative events in order to examine the different patterns of behavioural responses observed during each vignette, as well as the stability of children's behavioural responses across a series of vignettes. The emotionally evocative vignettes were chosen to represent a range of situations that can be characterised by different emotional and behavioural responses. The eight vignettes largely comprised situations that children are likely to have experienced or witnessed and, where possible, they present real emotional responses unfolding in context. The main vignette of interest was chosen, a priori, to evoke strong feelings of empathy in children. In Chapter 3, children were presented with a separation story narrative about an infant who becomes distressed on his mother's departure. In a similar vein, in the current study, a separation story was constructed that would draw children into the plight of a child protagonist who is also expressing strong distress signals. The vignette of interest depicts real footage of a young boy who becomes very distressed when his parents drop him off on his first day of school and subsequently depart, leaving him with the teacher (vignette 3). This video was chosen because of its obvious salience for Kindergarten children and its engaging separation narrative. On the basis of the findings in Chapter 3, it was predicted that children would respond to the first day vignette in much the same manner as for the mother-infant separation video presented in Chapter 3. That is, it was expected that the narrative of the boy's first day at school, culminating in heightened distress, would elicit relatively high levels of empathic sadness in children, but would also evoke personal distress in other children. Thus, relatively high levels of worry-concern and disengagement were also expected. This prediction has two parts, which are discussed in turn below.

First, as in Chapter 3, it is important to establish how children's behavioural responses are associated with specific events in the story narrative. Thus, the vignette depicting a child's first day of school is analysed in a manner similar to the infant-mother separation vignette presented in Chapter 3, although a more fine-grained approach is taken. Specifically, the first day of school vignette will be divided

into event-related epochs of equal lengths so that children's behavioural and affective responses in each epoch may be mapped onto the corresponding story event. In Chapter 3 it was shown that children's disengagement and communicative bids increased with an escalation in the emotional distress displayed by the protagonist of the vignette, while self-soothing behaviours remained stable across the whole vignette. Regarding agitative activity, there was some suggestion in Chapter 3 that, despite capturing a robust individual difference, the anticipation of the protagonist's negative predicament in the transitional epoch brought about a decrease in such activity that was suggestive of vigilance. Furthermore, the findings in Chapter 3 strongly suggested that expressions of worry-concern and sadness increase sharply with the protagonist's distress, but they did so in a slightly different manner. There was some indication that worry-concern anticipated the onset of the protagonist's distress, while sadness steadily increased as more distress was evident. This pattern of findings is expected to be repeated in the current study using the first day of school vignette. As in Chapter 3, it was also important to establish the stability of specific behavioural responses, relations across different behavioural responses, and their association with social competence. However, these issues will be taken up in the context of the contrasting conditions approach articulated below.

The second part of the predictions made in the current chapter involve a contrasting conditions approach so that children's behavioural responses across different emotion eliciting contexts, characterised by different emotions, could be compared (Cole, et al., 2004). The eight vignettes presented in the current study, and making up the Emotion Elicitation Paradigm, were specifically chosen to represent a range of different emotionally challenging situations and social encounters that children were likely to be familiar with. Comparing children's responses across vignettes will allow the stability of children's behavioural responses across distinct eliciting events to be examined, as well as the relation between different behavioural responses. Finally, the relation between children's behavioural responses to the challenging vignettes and their social adaptation as rated by teachers will be explored.

In addition to these broad goals, a number of important specific predictions concerning children's behavioural and affective responses elicited by the vignette of interest were also examined. To elucidate the significance of children's responses to the first day of school vignette, they can be contrasted against a number of other challenging emotional vignettes. These comparisons, in addition to providing information on differences in children's behavioural responses, are especially designed to clarify the nature of children's expressions of worry-concern and sadness, given the theoretical importance of understanding these expressions for empathy. As outlined in Chapter 2, there is some contention in the empathy literature as to whether an expression of worry-concern or sadness constitutes an empathic response to another's emotional distress (e.g., Eisenberg & Fabes, 1990; Eisenberg, et al., 1989; Eisenberg, McCreath, et al., 1988; Hastings, et al., 2000; Strayer & Roberts, 2004a; Zahn-Waxler, et al., 1992). The findings of Chapter 3, in the context of an ordinary empathy inducing event, strongly supported the view that expressions of worry-concern and sadness should be treated as distinct response modes. First, they occurred in different children, suggesting qualitatively different affective responses to the emotional content of the video. Second, there was some suggestion that the different expressions were elicited along a different temporal continuum; worry-concern appeared to precede (anticipate) the onset of distress, whereas sadness seemed to occur in response to (mirror) distress. Finally, there was some suggestion, albeit weak, that the two affective expressions had a different relationship with disengagement and maternally rated child behaviours. Regarding disengagement, there was a trend for children expressing worry-concern to use more disengagement. Given the link between elevated disengagement and more negative social outcomes (see Table 3.6), the association between disengagement and worry-concern suggests that worry-concern is unlikely to be indicative of empathy (Eisenberg & Fabes, 1992). Similarly, there was some suggestion that children expressing sadness were more prosocial. Granted the tenuous nature of these latter conclusions, if the findings of Chapter 3 can be repeated using comparisons across empathy and non-empathy inducing vignettes, a different pattern of findings for worry-concern and sadness would provide compelling

differential interpretations of these expressions. The comparisons of interest discussed in detail below.

First, the first day vignette is compared to a vignette depicting an infant in distress only (vignette 1) to provide a comparison between children's responses to another's distress that is situated within a (separation) narrative, compared to distress signals that do not have a clear contextual source. The distressed infant vignette is similar in content to the separation epoch in the mother-infant separation vignette presented in Chapter 3, however there are no prior contextual cues, meaning that the distress is not easily understood within a narrative. It is expected that children's will show less (empathic) sadness and greater personal distress (manifest as greater disengagement and greater worry-concern) to the infant's distress signals when compared to the first day vignette. The lack of contextual cues in the distressed infant vignette are predicted to make an empathic response less likely because their very absence impedes the possibility of psychological perspective taking.

The second comparison vignette comprises a young girl being socially excluded on the playground (vignette 7). This vignette is emotionally challenging because the girl is actively ignored and also experiences some physical abuse (i.e., hitting). What makes this vignette unique, however, is that the young girl does not display distress at her own plight. It is expected that the first day vignette will elicit greater empathic sadness than the social exclusion vignette because of the strong distress signals emitted by the young protagonist.

The final comparison vignette involves a narrative in which a young girl is being chased and is clearly fearful (vignette 8; taken from the movie *Annie*). This vignette is expected to result in greater attentional capture, and therefore less disengagement, when compared to first day vignette because of its compelling and scary narrative. This presentation is based largely on the functional nature of fear, which marshals attention, often experienced as vigilance or watchful monitoring (e.g., Mogg & Bradley, 1999). In addition, the narrative of the fear vignette is not expected to evoke strong empathy in young children because they should be scared. The findings of Eisenberg et al. (1988) support this latter prediction. They presented

children with both an empathy eliciting vignette, depicting a girl's sadness at the death of her pet, and a fear (anxiety) vignette, depicting two children afraid of a thunderstorm. They found greater amounts of sadness in response to the empathy vignette and greater fear and personal distress during the fear vignette. It is thus predicted that the fear vignette will elicit less sadness compared to the first day vignette, but more indications of personal distress (worry-concern). Somewhat unusually, the findings of Eisenberg and Fabes (1988) do not support the initial prediction as they observed greater disengagement in the fear vignette than the empathy vignette, which is unexpected on theoretical grounds. The impact of fear and empathy on disengagement is thus given close attention in the current chapter.

While the presentation of multiple video vignettes to elicit behavioural and affective responses is common (see Eisenberg, Fabes, et al., 1988; Strayer, 1993; Von Leupoldt, et al., 2007), there is only a small literature on the coherence of children's behavioural responses to different emotional events. In Chapter 3 there was considerable stability across the different eliciting contexts despite the brevity of the epochs. However, the importance of establishing the stability of behavioural responses across different vignettes becomes clear when attempting to aggregate children's behavioural responses across different vignettes, which is typical in the emotion regulation literature (e.g., Cole, et al., 1996). Furthermore, it is important to establish whether the significant behaviours observed in isolated instances actually constitute reliable behavioural dispositions of the child. If children's responses are not stable across different emotional events then a meaningful interpretation of the aggregated score is difficult.

The extant research examining the stability of children's behavioural responses across different contexts has been mixed. Grolnick and colleagues (1996) examined toddler's behavioural responses to two parent-separation situations and two delay situations. They found that there was consistency in children's behaviours within similar scenarios; that is, behaviours were consistent across two separation situations. There was, however, little consistency in behavioural responses across a separation and delay situation. In fact, even when examining similar situations, consistency in children's behavioural responses is not always apparent. For example,

Eisenberg and colleagues (1988) showed children two videos depicting child protagonists sustaining injury but did not find significant correlations for expressions of worry-concern or sadness across these two vignettes. In contrast, Miller, Eisenberg and colleagues (1996) found that five year old children's expressions of concern during a peer injury video vignette were significantly related to their expressions of concern during an adult injury simulation. Although these correlations were modest, they are impressive nonetheless because of the very different contexts in which children's behaviours were observed. Overall, these conflicting findings highlight the lack of research directly assessing the stability of children's responses to different emotionally evocative events and, therefore, the difficulty inherent in aggregating children's behavioural responses across different vignettes or assuming that certain patterns of behavioural responses distinguish children's in a systematic fashion.

From the standpoint of children's temperamental responding, there should be some degree of continuity in children's behaviours across a range of contexts. Furthermore, these specific responses should also be closely related to broader indices of children's self-regulation, such as impulsivity. Clearly however, it is difficult to make a distinction between children's temperamental responding and their emotion regulation, although an attempt may be made to delineate between these responses based on the extent to which they are context specific. Children's responses that are elicited across a broad range of events are likely indicative of individual differences in responding, whereas behaviours that are closely associated with specific events are likely to represent regulatory responses. It is children's regulatory responses that are hypothesised to be closely aligned to social functioning.

The current study aims to examine stability in children's behavioural responses across a series of emotionally challenging vignettes. Despite the limited findings on behavioural consistency across different emotional events in the extant literature, specific predictions are nonetheless provided. Disengagement, despite a high degree of contextual sensitivity, is expected to be a stable individual difference in behavioural responding in the context of emotionally challenging events. By

contrast, it is not expected that expressions of worry-concern or sadness will be observed in a majority of children. Nevertheless, based on the findings of Miller et al. (1996), it is predicted that worry-concern will be a stable individual difference in behavioural responding in the context of emotionally challenging vignettes. Furthermore, sadness, despite a high degree of contextual specificity is expected to be stable across situations that elicit empathic sadness.

In addition to the presentation of a series of emotionally evocative vignettes, in the current study the coding scheme was also modified to better capture children's behavioural responses. Specifically, the current study examines some behaviours outlined in Chapter 3 in more detail. Thus, agitative activity and the content of children's verbal communicative bids are given more fine-grained consideration.

In Chapter 3 it was hypothesised that children's agitative activity would be related to maternally rated hyperactivity. Somewhat surprisingly, no such relation was found. To further explore this finding the relation between a more nuanced assessment of children's agitative activity and their problem behaviours and impulsivity is examined in the current study. Three aspects of agitative activity are directly measured; (i) gross agitative activity, comprising large body movements, (ii) minor agitative activity, comprising small movements of the hands and fingers, and (iii) mouthing, comprising contortions and pursing of the mouth and lips, as well as manipulations of the mouth with the hands. Previous research has focused on different aspects of agitative activity, meaning that they have not yet been examined simultaneously (e.g., Diener & Mangelsdorf, 1999; Eisenberg, Fabes, et al., 1988; Eisenberg, Fabes, Guthrie, et al., 1996; see also Chapter 2). By including three separate measures of children's agitative activity, the current study is well placed to investigate associations between different modes of agitative activity, problem behaviours and impulsivity.

The current study also examined children's communicative bids more closely, with a specific focus on the content of children's verbal comments. Children's developing language skills allow them to communicate their feelings and ask questions regarding the object of their distress, possibly in order to understand and

regulate their emotional responses. Between the ages of two and five, the development of linguistic and conversational skills allows children greater scope for emotion understanding and provides the skills necessary to communicate this understanding with others (Denham, 1998). Such verbal skills also provide children with the means to engage in more effective regulatory strategies (Kopp, 1989; Stegge & Meerum Terwogt, 2007). The child is able to self-soothe by reassuring him/herself during distressing events (e.g., “his mummy is going to come back soon”), or turning to a caregiver and asking about the content of the event (e.g., “when is his mummy going to come back?”). Although research with toddlers has found verbalisations during emotionally challenging events to be very infrequent (Grolnick, et al., 1996), it is expected that school-aged children will use verbalisations to structure their emotional experience and better understand the cause of their distress.

In this study, the appropriateness of children’s comments during the emotionally challenging vignettes will be closely considered. A broad distinction will be made between those comments or questions that are directly relevant to the unfolding content of the emotional vignette, and those that are inappropriate given the content of the vignette. The semantic relevance or connectedness<sup>3</sup> of children’s comments during interactive play with a peer (Slomkowski & Dunn, 1996), or mother-child connected comments during play (Ensor & Hughes, 2008), have been found to be closely aligned with children’s social understanding (see also Dunn & Cutting, 1999). Although this research has examined connected and inappropriate comments during dyadic interactions, it is plausible that there is a fundamental distinction between children who attend to and address the emotional content unfolding before them, and children who attempt to avoid the emotional content by making irrelevant, unconnected comments during an emotional challenge. Given the connectedness literature, the former would be considered more adaptive.

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<sup>3</sup> A point of clarification is needed here. The relation between *connectedness* as employed here and the empirical literature on connected conversation is one of analogy. Should the distinction between connected and inappropriate comments turn out to be substantive, any conceptual link with parental conversational input will have to be independently substantiated.

Finally, in Chapter 3 children's prosocial and problem behaviours were assessed via maternal report. In the current study, teachers provided assessments of children's social skills, problem behaviours and social maturity relative to their peers. Mothers may give biased reports of their own child's behaviours because of their limited contact with children more generally, or for reasons of social desirability, and this may have contributed to the weak relation between children's behavioural and affective responses and their social conduct found in Chapter 3. Furthermore, parents have different expectations for socially competent behaviours, and have different opportunities to observe children's social behaviours compared to teachers who are potentially more accurate reporters of children's social conduct because of their broad experience with children and their understanding of individual children's competencies relative to a peer-group (Renk & Phares, 2004; Rose-Krasnor, 1997).

**Summary**

Using a new methodology to elicit emotional responses, the present study was designed to further investigate the findings presented in Chapter 3. First, in order to replicate the pattern of findings presented in Chapter 3, a similarly themed vignette was chosen to elicit regulatory and empathic responses. This vignette depicts a young boy who is brought to school by his parents on his first day of school but is clearly distressed and copes badly with his parents' departure. The story narrative and emotional displays were expected to be particularly salient for the children in the current sample as they had recently transitioned to school. Children's responses were first examined in a similar manner to the infant-mother separation vignette, by analysing the relation between behavioural responses and specific events in the unfolding vignette. It was expected that there would be a meaningful relation between the content of the vignette and children's responses. Thus, as in Chapter 3, it is expected that disengagement will rise sharply in response to the protagonists escalating distress, and this will be a fairly common response amongst children. Regarding worry-concern and sadness, it is expected that these expressions will strongly distinguish children such that there is very little sadness in the context of worry-concern and, inversely, there is expected to be very little worry-concern in the context of sadness. Furthermore, it was expected that the appearance of worry-

concern would, to some extent, precede clear manifestations of distress in the vignette protagonist. By contrast, it was expected that expressions sadness would escalate as a consequence of the distress expressed by the protagonist.

Also, as in Chapter 3, it was expected that mouthing and agitative activity (both gross and minor, as well as mouthing) would be manifest relatively consistently across the various epochs, and correspond to a stable individual differences between children. However, there was also a suggestion in Chapter 3 that agitative activity would show sensitivity (via a decrease) to attentional capture during the epoch in which it becomes evident that the protagonist will not cope well with the departure of his parents.

A series of additional vignettes were also introduced in the current study to allow for a comparison of children's behavioural and affective responses *across* situational contexts. Specific predictions regarding children's behavioural responses across different vignettes have been explained above and are just briefly recapitulated here. When compared to the first day vignette, it is predicted that: the distressed infant vignette will elicit less sadness and greater worry-concern; the social exclusion vignette is expected to elicit less sadness; and the fear vignette is expected to elicit less disengagement, less sadness and greater worry-concern.

Although it is expected that different vignettes, because of their different emotional themes, will elicit distinctive patterns of behavioural responding, nevertheless, a certain degree of stability across vignettes is also expected. After examining the relation within behavioural responses (across the different vignettes), the relation between different responses will be considered and specific predictions have been made above. In particular, given the close relation between emotion regulation and empathy proposed by Eisenberg and Fabes (1992), attention will be given to the relation between disengagement and affective expressions. In addition, the relation across different behaviours that make up agitative activity (gross and minor agitative activity and mouthing) will also be examined.

Finally, the association between children's observed responses to the emotional vignettes and their teacher rated social adaptation is examined. As shown in Chapter 3, children's disengagement during emotionally challenging vignettes is

expected to be negatively related to their social behaviour and positively related to their problem behaviours. Furthermore, given the potential for more accurate reporting by teachers on children's social competencies, and the larger sample in the present study, it is expected that children's expressions of sadness during an empathy eliciting event will be related to their social skills and social maturity.

## **4.2 Method**

### **4.2.1 Participants**

A total of 114 children (56 girls, *M* age = 67 months, *SD* = 5.0 months, range 55 – 77 months) were recruited from three schools in Sydney servicing middle to lower-middle class families. There were no exclusion criteria and no child experienced serious economic disadvantage. Children came from a mixture of ethnic backgrounds common to the area and had English as a native language. Whole classrooms were invited to participate, resulting in between 55% and 82% (*M* = 68%) of children recruited from each class (opt-out recruitment was not permissible). Children were recruited into the study over the course of two years, with 48 children in the first cohort, and 66 children recruited in the second cohort. The final sample reported in the current chapter comprised 113 children, as one child was absent from school on the days the Emotion Elicitation Paradigm was administered. Children participated in the study in the middle of their first year at school.

### **4.2.2 Behavioural responses**

The coding scheme was similar to that presented in Chapter 3, with three modifications; (i) the inclusion of unusual and contorted mouthing behaviours as a separate code, distinct from minor agitative activity, (ii) gross agitative activity and minor agitative activity were examined separately, and (iii) the content of children's verbal communicative bids were examined. These codes are described in more detail below. Disengagement, self-soothing behaviours, and affective responses were coded in the same manner as outlined in Chapter 3. Duration scores for each behaviour were converted into percentage duration to allow the comparison between vignettes of unequal size, with the exception of communicative bids, which

were converted into a frequency score denoting the number of communicative comments in each vignette.

### ***Agitative Activity***

Agitative activity included all instances of children's movements that had an agitative quality (see Chapter 3). Movements that were not classified as agitative typically occurred in a fluid and calm manner. In addition to separate codes for gross and minor agitative activity, children's mouthing behaviours were coded.

*Gross agitative activity*: typically defined by movements of the body but also included any movement of the arms, shoulders, head or trunk; for example, leg jiggling, restless bouncing in chair.

*Minor agitative activity*: included movements of the hands and fingers (e.g., finger tapping), nervous self-touching with the hands (e.g., hands to the face or hair), and fidgeting. While minor agitation includes movement of hand to face, if the movement specifically involved manipulation of the mouth it was coded as mouthing.

*Mouthing*: defined as any manipulation of the mouth, or mouthing movements, and included both mouthing with and without fingers in the mouth. Typically, mouthing included irregular manipulation of the mouth with the hands or tongue. In addition, grimaces were included in the mouthing code. A grimace comprised unusual or contorted mouth movements and was distinct from mouthing in that they were typically still contortions of the mouth as opposed to repetitive manipulations of the mouth.

### ***Self-soothing behaviours***

Self-soothing behaviours were determined by their repetitive quality and, as such, were persistent behaviours. Self-soothing included *repetitive* manipulation of the mouth with the hands or tongue, licking of lips, tongue and lip movements, and thumb-sucking, as well as non-mouth related movements such as hair twirling or repetitive stroking. Self-soothing and mouthing, although similar, were distinct codes. Mouthing (see agitative activity, above) comprised irregular manipulations of the mouth and were relatively short in duration, while self-soothing behaviours included repetitive and steady mouth manipulations, were typically of longer

duration, and had a conceivable soothing quality. Self-soothing behaviours were sometimes preceded by a mouthing code, and it was, in certain cases, difficult to distinguish when mouthing behaviours ceased and self-soothing behaviour began. There was a very little self-soothing behaviour in the current sample, thus, self-soothing behaviours will not be discussed further.

### ***Communicative Bids***

Children's verbalisations were divided into discrete comments. When a comment was on a distinct topic but contained numerous clauses, it was scored as one comment (e.g., there are train tracks. I can see train tracks). The content of children's verbal communicative bids were coded as follows (adapted from Slomkowski & Dunn, 1996):

*Connected comments*: included comments, interpretations or questions about the content of the vignette (e.g., I think she's lost). This code includes comments or questions that refer to the mental state of the characters in the vignette, and those comments that take into account feeling states (e.g., that's a sad baby), desires (e.g., he doesn't like school), or interpretations of mental state (e.g., I think it wants its teddy bear). Comments that provide an insight into the child's own response to or judgement of the vignettes (e.g., I really want that to stop; that boy is rude, he whacked the girl), or statements referring to the child's own experience (e.g., I cried a little bit then I stopped on my first day of school) were also included in this code.

*Inappropriate comments*: included any comments or questions that were unrelated to the content of the vignettes (e.g., I've got glue in my mouth). This code included comments or question about the procedure (e.g., what are we doing at the end of the video) or the materials being used (e.g., so why do we need these on?).

### ***Affect***

Anger, fear, joy, worry-concern, sadness (comprising facial sadness and postural sadness) were coded as outlined in Chapter 3 (see Section 3.2.2). Joy was only seen in three vignettes, crying infant ( $M_{\text{duration}} = .44$ ,  $SD = 1.95$ , 5% of children), happy infant ( $M_{\text{duration}} = 2.30$ ,  $SD = 7.02$ , 14% of children) and gift ( $M_{\text{duration}} = .11$ ,  $SD = .83$ , 2% of children). No child showed expressions of fear during the vignettes, and

only one child expressed anger. Due to the low incidence of joy, fear and anger expressions, they are not discussed further.

### **4.2.3 Social adaptation**

To assess children's social skills and problem behaviours teachers completed the Social Skills Rating System (SSRS Gresham & Elliott, 1990). The social skills component of the SSRS is a 30-item scale measuring the frequency (0 = never, 1 = sometimes, 2 = very often) of socially skilled behaviours in the classroom context and comprises subscales of assertion, cooperation and self-control. Teachers also completed the problem behaviours component of the SSRS, consisting of 18 items assessing the frequency of externalising, internalising and hyperactivity behaviours. A total social skills and problem behaviours score was calculated. The SSRS has established internal consistency,  $\alpha$ s range from 0.78 to 0.95.

Teachers also completed the Social Maturity Rating Scale (Peterson, Slaughter, & Paynter, 2007), a 7-item scale allowing teachers to report on each child's social maturity relative to other children of the same age. Each item was rated on a seven-point likert scale ranging from 1 (very much less mature than the average child of this age) to 7 (very much more mature than the average child this age). Each item was summed to create a total social maturity score,  $\alpha = 0.97$ .

Finally, teachers completed the Teacher-rated Impulsivity Scale (TRIS White et al., 1994). The TRIS provides information on children's impulsive behaviour in the classroom (e.g., 'fails to finish things he/she starts', 'talks out of turn'). Teachers rated each of the 6-items on a 3-point scale (0 = rarely, 1 = sometimes, 2 = always). Internal consistency for these items was high ( $\alpha = 0.89$ ). All items were combined to create a total impulsivity score whereby a higher score indicates greater impulsive behaviour. TRIS scores were only completed by teachers of children in the second cohort (N = 66). See Appendix C for questionnaires.

Teachers completed all social adaptation questionnaires after the children's testing session at the end of the school year, such that all teachers had spent one full year with the children and knew them well.

#### 4.2.4 Procedure

##### *Emotion elicitation paradigm*

Children viewed a series of eight video vignettes on a computer screen, seven of which were emotionally evocative. The vignettes were chosen to represent a range of emotions. With the exception of the fear vignette, the situations were selected to comprise situations that children were likely to have witnessed in peers and siblings, or experienced themselves. The eight vignettes comprised; 1) a distressed infant, 2) a happy infant, 3) a distressed child's first day of school, 4) happiness after receiving a gift, 5) an argument between friends, 6) a neutral affect scenario of two children eating lunch, 7) a child being socially excluded and, 8) a fearful girl. The eight vignettes are briefly outlined in Table 4.1. Following previous studies (e.g., Cole, et al., 1996; Strayer & Roberts, 1997), vignettes were presented in a fixed order, with a short gap (30 seconds) between each to aid recovery. Also, each vignette had a positive resolution to ensure that the vignette did not end on an upsetting tone and, thereby, abated children's distress.

The vignettes were of different lengths, which reflected the reality of the different situational contexts. Priority was given to ensure that: i) the protagonist's affective and behavioural responses were clearly recognisable; ii) the context for the emotional expression was established prior to the expression of emotion in the protagonist; and iii) the vignette concluded with a resolution of the emotionally evocative scenario. This approach resulted in vignettes of varying lengths (see Table 4.1).

A selection of the vignettes comprised segments of documentary footage of young children on their first day of school and interacting with peers on the playground (vignettes 3, 6 and 7)<sup>4</sup>. Vignette 3, depicting a child who becomes distressed on his first day of school, was chosen specifically to elicit empathic emotional reactions from the sample because of the strong distress signals emitted by the protagonist and the familiar setting within which the distress occurs. While upsetting, this video would not be outside the experience of typical children.

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<sup>4</sup> These were kindly provided by the Australian Broadcasting Corporation.

Vignettes 1 and 2, the distressed and happy infant vignettes, were created for use in this study and comprised spontaneous emotion displays from a nine-month-old infant. Vignettes depicting young children's distress have been used in previous studies investigating behavioural responses to challenging situations (e.g., Eisenberg & Fabes, 1995; Eisenberg, Fabes, et al., 1988; Gill & Calkins, 2003). It is important to note that the first two vignettes involved the same infant, so vignette 2 is consequently not independent for vignette 1. This decision was taken for theoretical reasons that do not relate to the current analyses. Nevertheless, it is important to keep in mind that children had, immediately prior to the happy infant vignette seen the same infant in heightened distress in the same context.

In addition to these vignettes, a number of acted stories were included, such as a peer argument (vignette 5), because suitable footage of a real situational context containing these themes could not be found. Typically, in the empathy and emotion regulation research, video vignettes employed to elicit emotion are acted scenarios taken from television or film (e.g., Eisenberg, Fabes, et al., 1988; Strayer, 1993). In the current study, however, documentary derived vignettes and the distressed and happy infant vignettes were employed because they depicted genuine emotional displays.

Prior to viewing the eight emotion vignettes, children viewed two short baseline vignettes; the first consisted of two children calmly talking, and the second consisted of an infant sitting and playing quietly. These preliminary vignettes were of short duration (60 seconds in total) and were included to introduce the child to the emotion elicitation paradigm format. Children's behavioural responses were not coded during the baseline vignettes as they were of short duration and many children required additional prompting to attend to the video vignette (no such prompting was given during the eight emotion eliciting vignettes).

Table 4.1  
Description of emotion eliciting vignettes

|    |  |
|----|--|
| 1. | <p><i>Distressed Infant</i>: An infant sits alone on a rug facing the camera. After 8 seconds he becomes distressed and his crying becomes persistent. The vignette is resolved with the infant is given a bottle (<i>Source</i>: private footage)</p> <p>Length: 55 seconds</p> <p>Protagonist: Infant</p> <p>Predominant Affect: sadness/distress</p>  |
| 2. | <p><i>Happy Infant</i>: An infant (same infant as vignette 1) lies on a colourful rug and laughs while his caregiver tickles and amuses him while getting him dressed. The caregiver indicates that the infant is playing the 'pants-game'. Only the infant is seen on camera. (<i>Source</i>: private footage).</p> <p>Length: 40 seconds</p> <p>Protagonist: Infant</p> <p>Predominant Affect: joy</p>   |
| 3. | <p><i>First Day</i>: A young boy is taken to school for the first time by both his parents. The boy voices his reluctance to go to school and becomes increasingly agitated. He attempts to run out of the school gate and his parents must coax him back. Once in the classroom, the boy displays increasing distress at being separated from his parents. The teacher must physically restrain him so that his parents can leave the classroom. The teacher sits the crying boy on her lap and tries to distract him. The vignette then cuts to the end of the school day and is resolved with a reunion between the boy with his mother. (<i>source</i>: 'First Day', Australian Broadcasting Corporation; This footage is an edited segment of a documentary on children's experiences on their first day of school)</p> <p>Length: 90 seconds</p> <p>Protagonist: Male</p> <p>Predominant Affect: sadness</p> |
| 4. | <p><i>Gift</i>: A young boy is seen burying his dead pet goldfish fish. Once he has finished burying his pet a friend visits and gives him two new goldfish. The vignette ends with the protagonist smiling at his gift. (<i>Source</i>: edited segment from '<i>Worst Best Friends</i>' Australian Broadcasting Corporation)</p> <p>Length: 45 seconds</p> <p>Protagonist: Male</p> <p>Predominant Affect: joy</p>  |
| 5. | <p><i>Argument</i>: Three children prepare ingredients to cook a chicken. A fight begins between the boy and girl over the best way to cook the chicken, while a second boy looks on. The boy and girl fight over the chicken, each holding onto it. The argument ends when the chicken breaks in two and the girl falls to the ground. (<i>Source</i>: edited segment from '<i>Worst Best Friends</i>' Australian Broadcasting Corporation)</p> <p>Length: 55 seconds</p> <p>Protagonist: Male &amp; Female protagonists</p> <p>Predominant Affect: anger</p>   |

6. *Neutral*: Two young girls eat lunch silently together in the classroom; no facial affect is observed. (*source*: 'First Day', Australian Broadcasting Corporation; This footage is an edited segment of a documentary on children's experiences on their first day of school).  
Length: 30 seconds  
Protagonist: Female  
Predominant Affect: N/A

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  7. *Social Exclusion*: A young girl is on a busy school playground looking for a friend to play with. She calls out 'wait for me' to a group of children who ignore her. She approaches a young boy who hits her with his hat. Another child ignores her initiation of play. She continues searching for someone to play with until she comes across a group of three girls who invite her to play and the vignette is resolved when the protagonist is shown holding hands with a new friend (*source*: 'First Day', Australian Broadcasting Corporation; This footage is an edited segment of a documentary on children's experiences on their first day of school).  
Length: 60 seconds  
Protagonist: Female  
Predominant affect: no affect displayed

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  8. *Annie*: This vignette comprises an edited scene from the film *Annie*. It shows Annie running to escape from two adults. She climbs up a bridge while being pursued and at the top of the bridge she slips and falls. Annie fearfully hangs from the side of the bridge. The vignette is resolved with Annie is rescued by a man in a helicopter and taken to safety. (*Source*: Columbia Pictures, an edited segment from the 1982 film 'Annie').  
Length: 65 seconds  
Protagonist: Female  
Predominant Affect: fear
- 

Children viewed the vignettes on a laptop computer screen in a quiet room at school. If there was any excess background noise children were offered headphones through which to hear the vignettes. The experimenter sat next to the child and also watched the vignettes, making sure to maintain neutral facial affect. When children made a verbal communicative bid the experimenter acknowledged the comment but did not enter into a discussion with the child. If a child asked the experimenter a direct question, the experimenter again acknowledged the question but did not respond. In the instances where the child repeated a question, the experimenter responded, "let's talk about that little later on, once the videos are finished".

Children's behavioural responses and facial affect was discreetly videotaped during the emotion elicitation paradigm. Coding for all affective and behavioural responses were conducted using Observer XT (Noldus, 2008). This sophisticated

behavioural coding software suite allowed continuous coding and fine-grained analysis. All behaviours were coded continuously for each of the eight vignettes, with the exception of connected and inappropriate comments, these responses scored as counts.

### **4.3 Results**

Five distinct categories of behaviour were of interest in the current chapter; (i) disengagement, comprising gaze and head avoidance, and distraction, (ii) verbal communicative bids, comprising connected and inappropriate comments, (iii) agitative activity, comprising gross and minor agitative activity, and mouthing, (iv) expressions of worry-concern, and (v) expressions sadness, comprising facial and postural sadness. First, reliabilities for the five behavioural categories are presented. Following reliability analyses, a series of analyses are presented to test the predictions made in the introduction. Thus, second, the relation between each behavioural response category and the content of specific epochs in the first day vignette is examined (Section 4.3.2). Third, the stability of behaviours across different vignettes is examined (Section 4.3.3). Fourth, behavioural responses are compared across different vignettes (i.e., first day [vignette 3], distressed infant [vignette 1], social exclusion [vignette 7] and fear [vignette 8]; Section 4.3.4). Fifth, the relation across different behavioural domains is examined (Section 4.3.5). Finally, the relation between children's behavioural responses and their social adaptation is examined (Section 4.3.6).

#### **4.3.1 Reliability**

Reliabilities are based on a random sample of 20 children, comprising 17.5% of the sample. Two coders, one blind to the study hypotheses, independently scored each child. Inter-coder reliability was high, Cohen's  $\kappa$  for behavioural codes were as follows; disengagement  $\kappa = .88$ , gross agitative activity,  $\kappa = .98$ , minor agitative activity  $\kappa = .76$ , and mouthing  $\kappa = .83$ . These reliabilities are comparable to other research investigating similar behavioural responses to emotional events (e.g., Buss & Goldsmith, 1998; Diener & Mangelsdorf, 1999; Grolnick, et al., 1996). All verbal communicative bids were transcribed, and a second coder, blind to the study

hypotheses, scored over 50% of children's verbalisations, resulting in a 98% agreement with the master coder. Disagreements (4 from of 175 comments) were resolved via conference with a third experienced coder.

There were a number of possible means by which to assess reliability for children's expressed affect. However, as the broad categorisation of children into affect categories was the main unit of analysis in this thesis, coders were required to categorise children into one of the three affect categories based on the child's dominant affective response during the relevant vignette. Fifty children were scored by two coders, one blind to the study hypotheses. Overall, there were five disagreements on affect group categorisation,  $\kappa = 0.92$ . Four of the five disagreements centred on the distinction between inexpressive and sad children. The remaining disagreement centred on the distinction between worry-concern and sad categorisation. This latter video was problematic because the child in question was highly agitated and obscured his mouth for the majority of the vignette. There were no disagreements between worry-concern and inexpressive children. All disagreements were resolved via conference with a third experienced coder to yield a final affect categorisation.

The following section centres on a close examination of the relation between specific events in the first day vignette and children's behavioural and affective responses.

### **4.3.2 Epoch Analysis**

In Chapter 3 it was shown that children's behavioural responses were meaningfully related to the vignette events. To confirm that findings were comparable in the current sample, an analysis was undertaken examining mean levels of each behavioural response across 10-second epochs of the first day vignette (e.g., Buss & Goldsmith, 1998; Diener & Mangelsdorf, 1999). The story events corresponding to each 10-second epoch are outlined in Table 4.2. The patterns of each behavioural response across the nine epochs of the vignette are examined in turn below.

Table. 4.2  
 Story events for each 10 second epoch for the 'First Day' vignette (vignette 3).

| Epoch | Story Events  |
|-------|---|
| 1.    | Young boy and his parents enter the school playground. Boy says he doesn't want to go to school and shows signs of protest                      |
| 2.    | Boy runs back out of the school gates and his parents must go and bring him back  |
| 3.    | Boy is taken into his classroom by his parents, and becomes visibly distressed  |
| 4.    | Parents attempt to leave and boy holds onto his mother and pleads with her to stay. Teacher restrains him                                       |
| 5.    | Parents leave. Boy is visibly crying and yelling for his mother while the teacher tries to prevent him from running after his mother and father |
| 6.    | Boy, highly distressed, sobs on teacher's lap while she tries to interest him in an activity  |
| 7.    | Boy starts to calm down in this epoch and begins to take an interest in the teacher's activity  |
| 8.    | The end of the school day and the young boy is participating in classroom activity  |
| 9.    | Mother comes to pick him up and he excitedly shows her his schoolwork   |

As seen in Figure 4.1, children's disengagement peaked (epoch 7) very shortly after the story protagonist showed the greatest distress (epoch 6). At the story conclusion, when the story protagonist was reunited with his mother, disengagement returned to the same level as the beginning of the vignette. The pattern of disengagement across the nine epochs of the first day vignette strongly suggest that this behavioural response is highly context specific.

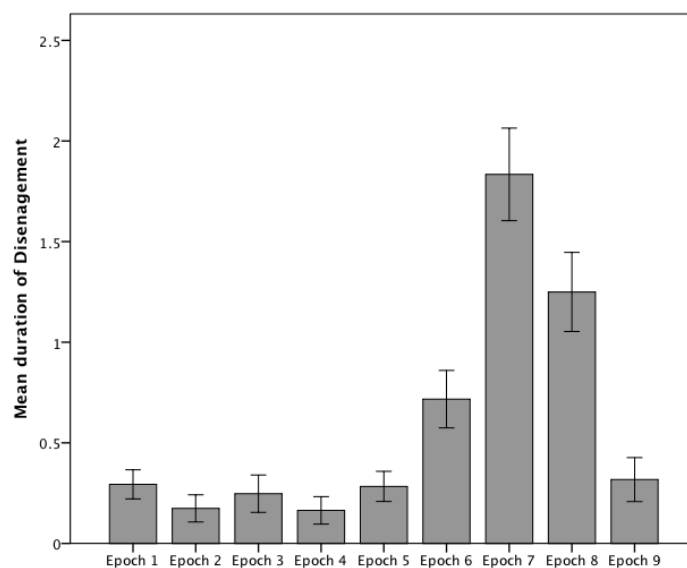


Figure 4.1. Mean duration of disengagement during 10-second epochs of vignette 3 (error bars represent 1 standard error)

Children's gross and minor agitative activity by epoch are shown in Figures 4.2 and 4.3. First, it is notable that agitative activity was manifest throughout the vignette. The only real exception was a decrease in agitative activity during the epochs when the story protagonist was anticipating and trying to prevent the departure of his parents (epochs 4 and 5), which corresponded with the beginning of his overt distress. This sharp decrease was marked for gross agitative activity but it is less clear if it is meaningful for minor agitative activity. Once it was evident that the protagonist's distress was continuing, however, the levels of children's gross and minor agitative activity increased and returned to similar levels as seen in epochs 1 through 3. This drop in activity during epochs 4 and 5 is suggestive of a degree of vigilance toward the unfolding scenario during the period covering the anticipation and onset of the protagonist's distress. Thus, it appears that both gross and minor agitative activity are meaningfully related to the content of the challenging vignette with particular sensitivity to the boy's mounting distress at his parent's departure (i.e., separation). By contrast, the pattern of children's mouthing behaviours across the nine epochs showed little clear relation to the story events (see Figure 4.4). Children appeared to enact a similar level of mouthing across all vignette epochs regardless of their content, although there was, of course, some variation.

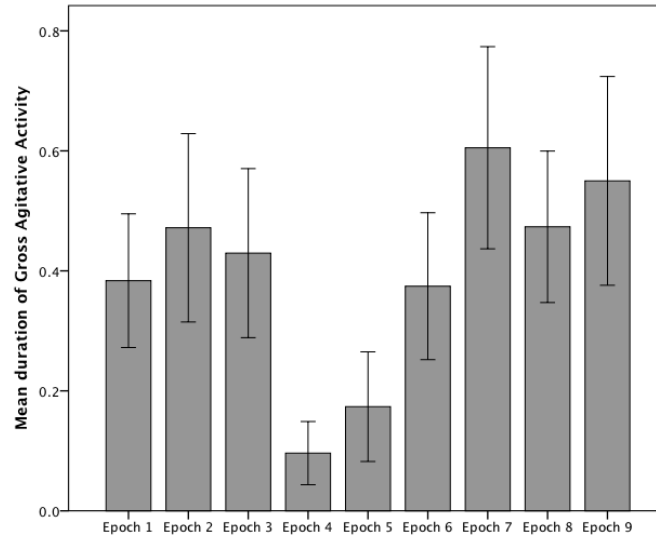


Figure 4.2. Mean duration of gross agitative activity during 10-second epochs of vignette 3 (error bars represent 1 standard error)

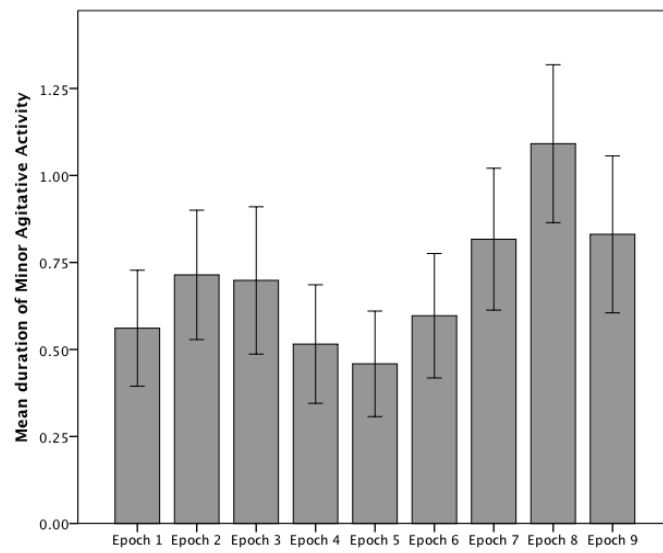
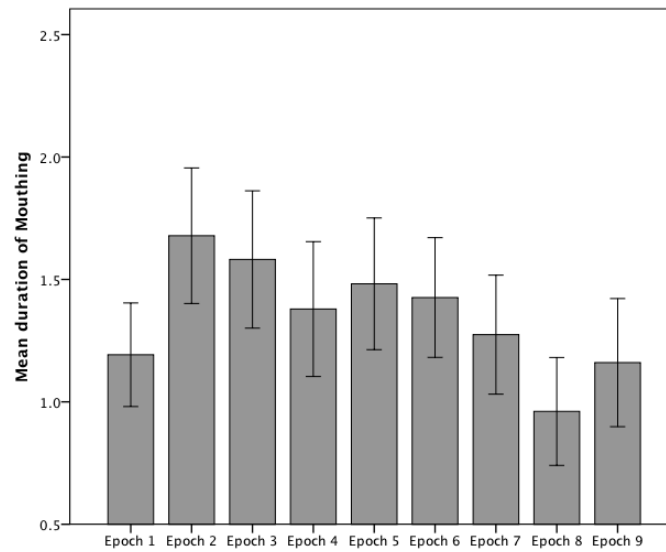


Figure 4.3. Mean duration of minor agitative activity during 10-second epochs of vignette 3 (error bars represent 1 standard error)



*Figure 4.4.* Mean duration of mouthing during 10-second epochs of vignette 3 (error bars represent 1 standard error)

Finally, children's expressions of worry-concern and sadness (see Figures 4.5 and 4.6) appeared to be systematically related to the distress displayed by the protagonist of vignette 3. Replicating the findings of Chapter 3, expressions of worry-concern increased prior to the overt distress displayed by the protagonist. It should be emphasised that there are some initial indications in epoch 1 that the boy does not want to go to school, so there is a foreboding of his resistance but not clear indications of distress until epoch 3. In this sense, early signs of worry-concern appear to correspond to the anticipation of the unfolding scenario. Conversely, and also in parallel to the findings of Chapter 3, children's expressions of sadness do not begin until the protagonist displays overt distress, and they increased as the distress persisted. Sadness thus appeared to be a direct response to witnessed distressed in the protagonist's distress signals.

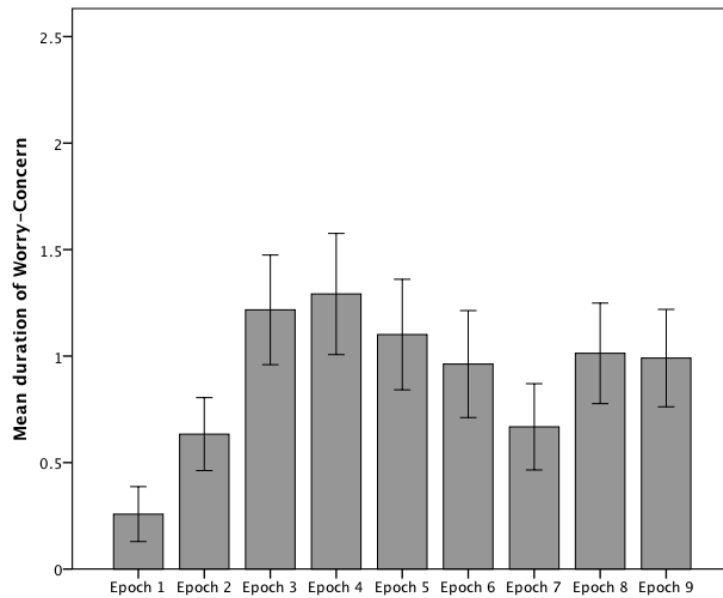


Figure 4.5. Mean duration of expressions of worry-concern during 10-second epochs of vignette 3 (error bars represent 1 standard error)

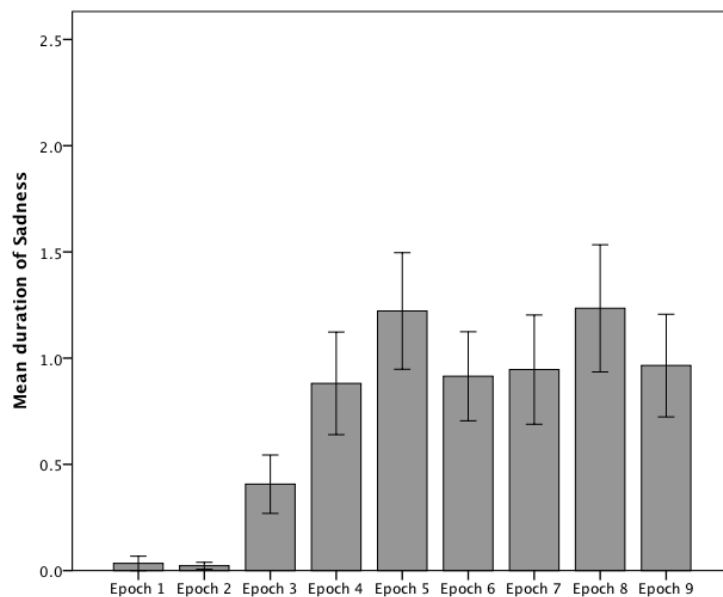


Figure 4.6. Mean duration of expressions of sadness during 10-second epochs of vignette 3 (error bars represent 1 standard error)

There were too few connected and inappropriate comments made during vignette 3 for an analysis by epoch.

#### 4.3.3 Stability of behavioural responses

Table 4.3 shows the mean duration (as a percentage of total vignette time) for each behavioural response, the percentage of children in each vignette that showed at least one instance of the behaviour and the internal consistency of

children's responses across vignettes. In this section, attention is given to stability across all vignettes, as well as those vignettes of primary theoretical interest (vignettes 1, 3, 7 and 8; V1378). In the following section, differences in behavioural responses across vignettes are examined in light of the specific predictions made in the introduction (see Section 4.3.4). There was a large amount of variability in behaviours both across vignettes, as well as within each individual vignette. Generally, it appeared that vignettes 4, 5 and 6 elicited fewer behavioural responses associated with emotion regulation (disengagement and affect) compared to V1378. While Vignette 2 did elicit high levels of disengagement, the primary interest of the current study was children's responses to emotionally challenging negative situations. Furthermore, both vignette 1 and 2 depicted the same infant. Thus, despite the infant's display of positive affect in vignette 2, children had just previously witnessed him in sustained distress.

Table 4.3 also presents Cronbach's  $\alpha$ s for the mean duration (as a percentage) for each behaviour across all eight vignettes. It can be seen that the majority of children's responses to the range of challenging (and neutral) vignettes were highly consistent. Across a wide range of contexts, there is impressive individual stability in behavioural responding despite the very distinctive response patterns to different vignettes. Inappropriate comments, however, had a moderate alpha level, although this may be due to the relatively infrequent nature of this response. Because of the low frequency of inappropriate comments, they are not analysed further by vignette; children simply received a dichotomous classification signifying the presence or absence of inappropriate comments. Furthermore, as expected, children's expressions of sadness were less consistent across the eight vignettes. This may be understood with reference to the fact that sadness was only observed in specific contexts, vignette 3 primarily but also vignette 8, a finding that is consistent with predictions.

Given the specific prediction concerning the emotional content of V1378, and the proportions of children displaying each behaviour, the subsequent analyses focus on children's responses to these four vignettes only. These four vignettes all depict strong emotional themes and, with the exception of the fear vignette

(vignette 8), represent genuine emotional displays. Furthermore, vignettes 1, 3 and 8 all clearly depict negative facial affect in the protagonist. Across V1378 cronbach  $\alpha$ s for each behavioural response were as follows: disengagement  $\alpha = .56$ ; gross agitative activity  $\alpha = .55$ ; minor agitative activity  $\alpha = .47$ ; mouthing  $\alpha = .75$ ; connected comments  $\alpha = .82$ ; worry-concern  $\alpha = .79$ . For sadness, there was a robust correlation between vignette 3 and vignette 8, despite the relatively low incidence of sadness,  $r(113) = .38, p < 0.01$ . Low reliability for minor agitative activity was not unexpected given the relatively low frequency of this behaviour.

Table 4.3

Means as a percentage of total vignette time (standard deviations in parentheses) percentage of children displaying behaviour in each vignette, and Cronbach's  $\alpha$  across the eight vignettes

|                             | Vignette                |                         |                         |                         |                         |                         |                         |                         | $\alpha$                  |
|-----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|---------------------------|
|                             | 1                       | 2                       | 3                       | 4                       | 5                       | 6                       | 7                       | 8                       |                           |
| Disengagement               | 10.42<br>(10.93)<br>86% | 9.58<br>(11.25)<br>72%  | 5.76<br>(6.53)<br>80%   | 3.78<br>(5.26)<br>61%   | 4.53<br>(7.97)<br>54%   | 5.81<br>(10.05)<br>46%  | 2.73<br>(5.55)<br>39%   | 1.28<br>(3.13)<br>29%   | .73                       |
| Gross agitative activity    | 5.14<br>(11.83)<br>33%  | 6.94<br>(11.50)<br>36%  | 3.91<br>(6.93)<br>40%   | 6.01<br>(11.55)<br>34%  | 9.55<br>(14.86)<br>50%  | 8.86<br>(15.44)<br>38%  | 7.20<br>(13.04)<br>39%  | 2.24<br>(6.17)<br>23%   | .75                       |
| Minor agitative activity    | 2.84<br>(7.62)<br>20%   | 3.66<br>(11.23)<br>14%  | 5.93<br>(11.06)<br>36%  | 3.22<br>(10.70)<br>16%  | 4.54<br>(11.26)<br>22%  | 3.97<br>(11.74)<br>16%  | 4.70<br>(11.92)<br>26%  | 1.91<br>(5.84)<br>17%   | .72                       |
| Mouthing                    | 15.32<br>(18.70)<br>72% | 14.45<br>(21.52)<br>59% | 15.20<br>(20.21)<br>77% | 13.15<br>(23.44)<br>45% | 14.13<br>(20.68)<br>60% | 12.69<br>(20.44)<br>51% | 16.25<br>(23.40)<br>57% | 12.79<br>(24.09)<br>50% | .81                       |
| Connected comments (counts) | .32<br>(.93)<br>15%     | .22<br>(.66)<br>13%     | .64<br>(1.42)<br>24%    | .15<br>(.50)<br>11%     | .08<br>(.33)<br>6%      | .23<br>(.62)<br>14%     | .23<br>(.77)<br>12%     | .58<br>(1.34)<br>23%    | .82                       |
| Inappropriate comments (01) | .08<br>(.27)<br>8%      | .04<br>(.21)<br>4%      | .07<br>(.26)<br>7%      | .05<br>(.23)<br>5%      | .04<br>(.21)<br>5%      | .08<br>(.27)<br>8%      | .05<br>(.23)<br>5%      | .07<br>(.26)<br>7%      | .56                       |
| Worry-concern               | 3.31<br>(9.52)<br>26%   | 1.38<br>(9.83)<br>6%    | 8.94<br>(16.00)<br>50%  | 8.84<br>(19.95)<br>27%  | 8.54<br>(18.60)<br>37%  | 5.07<br>(14.50)<br>19%  | 13.29<br>(24.42)<br>36% | 12.64<br>(23.75)<br>36% | .87<br>(.75) <sup>a</sup> |
| Sadness                     | 1.58<br>(6.74)<br>8%    | .63<br>(5.49)<br>2%     | 7.19<br>(13.65)<br>31%  | 1.39<br>(7.17)<br>6%    | .97<br>(4.03)<br>6%     | 0.00<br>(0.00)<br>0%    | 3.35<br>(11.11)<br>12%  | 5.59<br>(13.83)<br>22%  | .67<br>(.57) <sup>a</sup> |

<sup>a</sup> Cronbach  $\alpha$  for worry-concern and sadness as a dichotomous variable

1 = Distressed infant, 2 = Happy infant, 3 = First day, 4 = Gift, 5 = Argument, 6 = Neutral, 7 = Social exclusion, 8 = Fear.

Reliability for disengagement and gross agitative activity were modest but acceptable in light of the overall pattern of stability (Table 4.3), and the high level of contextual variation in children's behavioural responding (particularly for disengagement). In fact, disengagement showed the lowest means and frequencies in vignettes 7 and 8.

Regarding sadness, there was modest stability between vignette 3 and vignette 8, however, as already noted, only vignette 3 provoked a considerable amount and frequency of sadness.

#### **4.3.4 Behaviour by Vignette**

The mean duration of each behavioural response was compared across the four vignettes of interest (V1378) using repeated measures ANOVAs to determine if they elicited different patterns of behavioural responding. In keeping with the predictions presented in the Introduction, contrasts were conducted to test for specific differences between the first day vignette (vignette 3) and the other vignette scenarios. As some behavioural responses were observed in a small proportion of children, it was inappropriate to use a repeated measures ANOVA and, in these cases, a descriptive analyses was undertaken.

The proportion of children showing disengagement appeared to be closely related to the content of the vignette, the greatest amount of disengagement occurring during vignettes 1 and 3; these two vignettes depicted continued emotional distress in the absence of fear. A repeated measures ANOVA showed a significant difference in children's disengagement across the four vignettes,  $F(3, 336) = 47.71, p < 0.01$ . To examine predicted differences in disengagement, repeated measures contrasts with the first day vignette as the reference group were conducted. As predicted, when compared to the first day vignette, children showed greater disengagement in response to the distressed infant,  $F(1, 112) = 22.59, p < 0.01$ , but less disengagement in response to the social exclusion vignette,  $F(1, 112) = 21.61, p < 0.01$ , and the fear vignette,  $F(1, 112) = 54.96, p < 0.01$ .

Gross agitative activity was seen in between 23% and 40% of children across the 8 vignettes. Mean levels of gross agitative activity were lowest in those vignettes with a protagonist displaying distress (vignette 1, 3 and 8) and therefore lower levels

of gross agitative activity may be suggestive of children's attentional capture; a proposal further supported by high mean levels of gross agitation during the neutral vignette. A repeated measures ANOVA showed a significant difference in children's gross agitative activity across the four vignettes,  $F(3, 336) = 6.72, p < 0.01$ . Repeated measures contrasts indicated that there was no significant difference in gross agitative activity between the first day vignette and the distressed infant vignettes,  $F(1, 112) = 1.21, p > 0.05$ . However, when compared to the first day vignette there was a significant increase in gross agitative activity in the social exclusion vignette  $F(1, 112) = 6.41, p < 0.05$ , and a significant decrease in the fear vignette,  $F(1, 112) = 5.46, p < 0.05$ . The decrease in gross agitative activity in the fear vignette is suggestive of an orienting response and vigilance toward the compelling narrative.

Between 17% and 36% of children were observed engaging in minor agitative activity across the four vignettes of interest, with the greatest amount of minor agitative activity observed in the first day vignette. A repeated measures ANOVA showed a significant difference in children's minor agitative activity across the four vignettes,  $F(3, 336) = 5.06, p < 0.01$ . Compared to the first day vignette, there was a significant decrease in minor agitative activity in the distressed infant,  $F(1, 112) = 8.07, p < 0.01$ , and fear vignette,  $F(1, 112) = 13.01, p < 0.01$ . There was no significant difference in minor agitative activity in the social exclusion vignette compared to the first day vignette,  $F(1, 112) = .99, ns$ .

Mouthing was relatively more common than both minor and gross agitative activity, and was observed in between 50% and 77% of all children (see Table 4.3). A repeated measures ANOVA found no significant difference in children's mouthing across the eight vignettes,  $F(3, 336) = .91, p > 0.05$ , suggesting that children engaged in mouthing behaviours indiscriminately across all vignettes.

Children's connected comments were most frequent in vignette 3 and 8. However, connected comments were only observed in a small proportion of children, thus precluding the use of a repeated measures ANOVA to assess differences. Inappropriate comments were considerably less frequent than connected comments, thus a dichotomous variable was created, such that just the presence or absence of inappropriate comments was examined. The mean number

of inappropriate comments across the four vignettes suggests that children made inappropriate comments at a similar level across all vignettes. Given the low proportion of children making these comments a repeated measures ANOVA to assess differences was inappropriate.

Expressions of worry-concern were observed more frequently across the four vignettes compared to sadness. A repeated measures ANOVA showed a significant difference in children's expressions of worry-concern across the four vignettes,  $F(3, 336) = 12.28, p < 0.01$ . Repeated measures contrasts showed that, compared to the first day vignette, there was significantly less worry-concern in the distressed infant vignette,  $F(1, 112) = 21.29, p < 0.01$ , and greater worry-concern in the social exclusion vignette,  $F(1, 112) = 4.89, p < 0.05$ . There was also a marginally significant difference between the amount of worry-concern in the fear vignette compared to the first day vignette, with greater worry-concern seen in the fear vignette,  $F(1, 112) = 3.54, p = 0.06$ . These comparisons partially support predicted differences in worry-concern across these vignettes.

Finally, expressions of sadness were extremely specific to the eliciting context, with little sadness elicited in those vignette that were not expected to induce empathy (Vignette 1 and 7), while there was considerably more sadness observed during the first day vignette and fear vignette. Given the small proportion of children expressing sadness in vignettes 1 and 7, it was inappropriate to test for differences across the four vignettes with a repeated measures ANOVA. Examining the mean level of sadness across the vignettes, however, does provide partial support for the predictions made in the current chapter. There appeared to be greater sadness expressed in the first day vignette compared to the distressed infant and social exclusion vignette. However, although the amount of sadness expressed during the first day vignette was greater than the fear vignette, this difference was in the predicted direction but was not large.

The findings outlined above show that the four vignettes elicited different patterns of behavioural responses in children. With the exception of children's mouthing behaviours and inappropriate comments, the remaining behavioural responses were elicited at significantly different rates across the distressed infant,

first day, social exclusion and fear vignettes, and these differences were broadly predictable. The subsequent analyses examine the stability of children's behavioural responses across the different vignettes.

#### **4.3.5 Relations between different behaviours**

It is typical in the literature to sum across vignettes of similar valence in order to calculate total scores (e.g., Calkins, et al., 1999; Diener & Mangelsdorf, 1999; Grolnick, et al., 1996; Stifter & Braungart, 1995). Given the relative stability of the majority of children's responses, with the exception of affect, responses were summed across the 4 vignettes (V1378) to create an overall disengagement, gross agitative activity, minor agitative activity and mouthing score, reflecting the proportion of time children displayed each behaviour. The number of connected and inappropriate comments were also summed across the four vignettes and, as outlined above, total inappropriate comments were dichotomised. Given the inconsistent findings regarding the stability of minor agitative activity and inappropriate comments, caution was taken when interpreting these overall scores. See Table 4.4 for summary statistics of overall behavioural scores. Summary statistics for the omitted vignettes (vignettes 2, 4, 5 and 6, V2456) are provided for comparison. These vignettes will be further examined in Section 4.3.6, where relations between behavioural responding and children's social adaptation are considered.

Given the contextual specificity of affective responses, particularly expressions of sadness, combined scores were not calculated. Instead children were categorised based on their dominant affective response to the first day vignette (vignette 3) in the same manner as Chapter 3 (Section 3.3.5, Cole, et al., 1996). The first day vignette was a priori thought to elicit empathic responses in children, and the absence of sadness in the other vignettes supports the decision to categorise children based on this vignettes. As the protagonist of vignette 3 was male, an ANOVA was conducted to test for possible sex effects, however, there was no significant sex difference in the duration of expression worry-concern,  $F(1, 111) = 1.90, ns$  or sadness,  $F(1, 111) = 1.38, ns$ , during this vignette.

Thus, children were allocated into one of three affect groups based on their dominant expressed affect. To be classified worry-concern or sad children needed to display the relevant emotion for longer than two seconds (as in Chapter 3). There were three children classified as inexpressive who displayed worry-concern for less than 2 seconds of the vignette. All children that expressed sadness did so for more than 2 seconds. This affect group categorisation based on dominant expression resulted in profoundly distinct groups (see Figure 4.7). Affect group classifications yielded 45 children (17 girls) in the inexpressive group, 34 children (20 girls) expressing worry-concern and 34 children (18 girls) expressing sadness. There was no significant association between sex and affect classification,  $\chi^2_2(N = 113) = 3.79$ , *ns*, although there was a tendency for boys to be categorised as inexpressive and girls to be categorised as worry-concern.

Table 4.4

Mean, standard deviation and range of combined behavioural scores, N = 113

| Behaviour                                 | Mean  | SD    | Range      |
|---|-------|-------|------------|
| Disengagement <sub>V1378</sub>            | 20.19 | 10.63 | 0 – 83.16  |
| Disengagement <sub>V2456</sub>            | 23.70 | 23.51 | 0 – 116.86 |
| Gross agitative activity <sub>V1378</sub> | 18.49 | 26.01 | 0 – 175.44 |
| Gross agitative activity <sub>V2456</sub> | 31.37 | 37.27 | 0 – 193.50 |
| Minor agitative activity <sub>V1378</sub> | 15.37 | 23.41 | 0 – 94.81  |
| Minor agitative activity <sub>V2456</sub> | 15.39 | 28.89 | 0 – 144.59 |
| Mouthing <sub>V1378</sub>                 | 59.55 | 65.51 | 0 – 295.88 |
| Mouthing <sub>V2456</sub>                 | 54.42 | 58.51 | 0 – 347.49 |
| Connected comments <sub>V1378</sub>       | 1.77  | 3.7   | 0 – 19     |
| Connected comments <sub>V2456</sub>       | 0.68  | 1.43  | 0 – 7      |
| Inappropriate comments <sub>V1378</sub>   | 0.20  | 0.40  | 0 – 1      |
| Inappropriate comments <sub>V2456</sub>   | 0.18  | 0.38  | 0 – 1      |

Note: V1378 = Total duration across vignettes 1, 3, 7 and 8. V2456 = Total duration across vignettes 2, 4, 5 and 6.

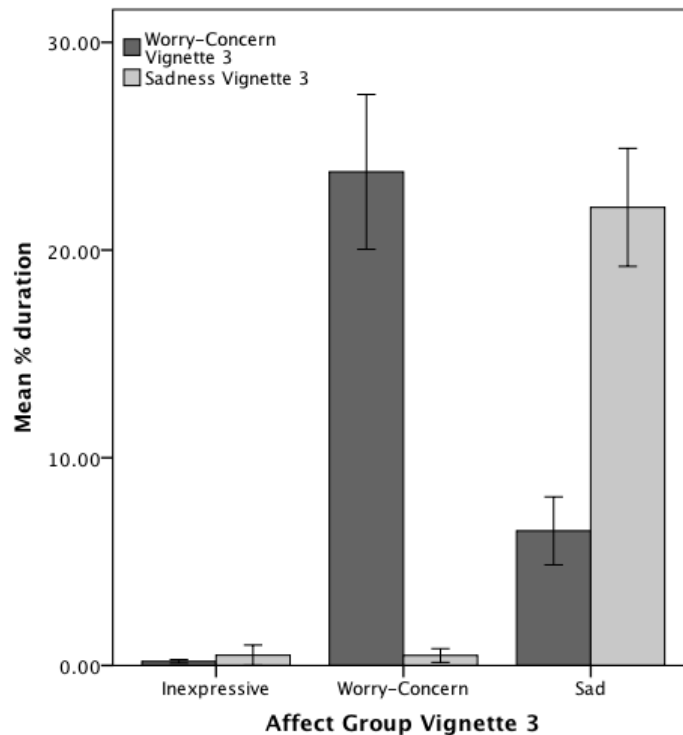


Figure 4.7. Duration of worry-concern and sadness as a function of affect groups in vignette 3 (error bars represent 1 standard error)

Bivariate correlations were conducted to explore relations across different behaviours, and ANOVAs were conducted to examine the association between behavioural responses and affect category. There were few associations between the behaviours enacted by children when faced with emotionally evocative vignettes (see Table 4.5). Greater gross agitative activity was likely to co-occur with greater disengagement, and those children engaging in minor agitative activity were also more likely to make both connected and inappropriate verbalisations. However, these correlations were small to moderate in magnitude. Also, unsurprisingly, children making connected comments were also likely to make inappropriate comments. Given the frequency of inappropriate comments, this correlation strongly suggests that children making such inappropriate comments were, generally, verbose. It is notable that the three measures of agitative activity – gross agitative activity, minor agitative activity and mouthing behaviours – were not robustly correlated as might be expected. Sex, was only modestly related to minor agitative activity and inappropriate comments; boys were more likely to engage in both minor agitative activity and make inappropriate comments compared to girls.

Table 4.5  
Bivariate correlations between combined behavioural scores

|                             | 1. | 2.   | 3.   | 4.    | 5.               | 6.    | 7.    |
|-----------------------------|----|------|------|-------|------------------|-------|-------|
| 1. Sex                      | –  | -.15 | -.14 | -.22* | -.09             | -.13  | -.23* |
| 2. Disengagement            |    | –    | .24* | .10   | .02              | .03   | .16   |
| 3. Gross agitative activity |    |      | –    | -.01  | .18 <sup>+</sup> | .08   | .05   |
| 4. Minor agitative activity |    |      |      | –     | .05              | .31** | .31** |
| 5. Mouthing                 |    |      |      |       | –                | .04   | .14   |
| 6. Connected comments       |    |      |      |       |                  | –     | .59** |
| 7. Inappropriate comments   |    |      |      |       |                  |       | –     |

\* $p < 0.05$ , \*\*  $p < 0.01$ .

To test for differences in behavioural responses by affect group, a series of ANOVAs were conducted. There were no significant differences in gross agitative activity, minor agitative activity, mouthing or connected comments by affect group, nor did these behaviours have a significant sex by affect group interaction. Unlike the findings of Chapter 3, which revealed no relation between disengagement and affect group, in the current analyses there was a marginally significant difference in disengagement across affect groups,  $F(2, 110) = 2.37$ ,  $p = 0.10$ . Further analysis revealed a significant interaction between sex and affect group on disengagement,  $F(2, 107) = 5.10$ ,  $p < 0.01$ ,  $R^2 = .15$ , however there were no significant main effects for either affect group,  $F(2, 107) = 1.72$ , *ns*, or sex,  $F(1, 107) = 1.91$ , *ns*. Follow-up contrasts comparing the sad group to worry-concern and inexpressive on average, as well as comparing inexpressive and worry-concern revealed that the difference in disengagement between boys and girls in the sad group was the same as in the inexpressive and worry-concern group on average. However, the difference in disengagement between inexpressive and worry-concern groups was significantly different for boys and girls; girls displaying relatively high levels of disengagement were likely to express worry-concern, whereas boys with greater disengagement were likely to be inexpressive (see Figure 4.8).

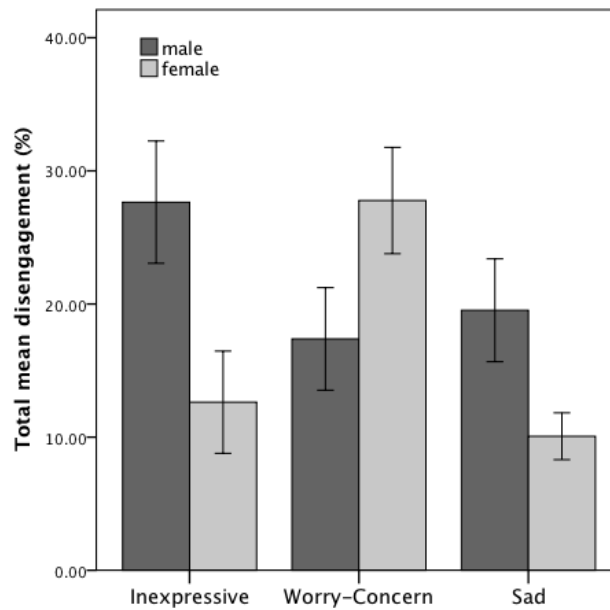


Figure 4.8. Duration of total disengagement across Vignette 1, 3, 7 and 8 as a function of affect group and sex (error bars represent 1 standard error)

In addition, there was a marginally significant difference in inappropriate comments across affect groups,  $F(2, 110) = 2.98, p = 0.06$ . Follow-up pair-wise analysis using Tukey's HSD revealed a significant difference in the number of inappropriate comments made by children expressing worry-concern compared to sadness,  $p < 0.05$ . Children expressing worry-concern ( $M = .32, SD = .47$ ) made a significantly greater number of inappropriate comments during the vignettes compared to children expressing predominantly sadness ( $M = .09, SD = .29$ ). This finding suggests that children who made inappropriate comments were likely to express worry-concern. Given the sex difference in inappropriate comments, a two-way ANOVA was conducted with both sex and affect group as independent variables predicting children's inappropriate comments. There was a significant main effect for both affect group,  $F(2, 107) = 3.47, p < 0.05$  and sex  $F(1, 107) = 6.92, p < 0.05$ , but no significant interaction between affect group and sex.

However, in the significant interaction between affect group and disengagement outlined above affect group and disengagement are not independent. Thus, a cautious approach was taken whereby the relation between affect group (derived from vignette 3) and disengagement during vignettes 1, 7 and 8 was examined, and compared to the relation between affect group and

disengagement derived exclusively from vignette 3. The significant interaction between affect group and sex remained when examining disengagement in vignettes 1, 7 and 8 only,  $F(2, 107) = 3.56, p < 0.05$ . Furthermore, when examining the relation between affect group and behaviours observed during vignette 3 only, a similar pattern of findings emerged. There was a significant interaction between sex and affect group on disengagement when derived from vignette 3 only,  $F(2, 107) = 3.70, p < 0.05$ . Overall, the relation between disengagement and affect, moderated by sex, is evident both within vignette 3 and when disengagement and affect are assessed in separate vignettes.

This same approach was taken to with the remaining behavioural responses. When behavioural responses were derived from either vignette 3 only or vignette 1, 7 and 8, there remained no significant difference in gross agitative activity, minor agitative activity, mouthing or connected comment as a function of affect group, a non-significant finding that is comparable to the result when using total observed behaviours across all four vignettes. Finally, there was no relation between inappropriate comments in vignette 3 and affect group, however, only eight children made inappropriate comment during vignette 3 which makes this finding difficult to interpret. When inappropriate comments were summed across vignettes 1, 7 and 8, there remained a significant difference in these comments as a function of affect group in the same direction as outlined above.

#### **4.3.6 Behavioural responses and social adaptation**

Table 4.6 shows the correlations between children's behavioural responses and their social adaptation. In order to assess the significance of children's behavioural responding in difference contexts (see Introduction) combined scores for V1378 are directly compared with combined score for V2456. It is noteworthy that mean level of behavioural responses for V1378 and V2456 are very similar (see Table 4.4); these groups of vignettes differ in that V1378 were more emotionally challenging and predicted to reveal meaningful differences in children's abilities to manage their arousal. Conversely, the combined total for V2456 reflects children's behavioural responses across positive, neutral and negatively valence vignettes, and as such, is used as a comparison to the former total only.

Table 4.6 shows that children who were observed to disengage less from V1378 were more likely to be rated as socially skilled and mature. This pattern of responding was similar when disengagement was assessed in V2456, but the relation was more robust in V1378. Those children disengaging more from V1378 were more likely to have higher levels of problem behaviours, there was no such relation between disengagement in V2456 and problem behaviours. Notably, in either group of vignettes, disengagement was not related to children's impulsivity or hyperactivity.

There was no relation between gross agitative activity, minor agitative activity, mouthing or connected comments and children's social skills, social maturity or problem behaviours in either V1378 or V2456. However, inappropriate comments, although infrequent, were positively related to children's social skills and problem behaviours but only when assessed in the context of V1378. Furthermore, children making greater inappropriate comments were also likely to be impulsive. In fact, minor agitation and mouthing were all indicative of children's impulsivity and this relation was especially robust in V1378 compared to V2456. This finding is noteworthy because minor agitation and mouthing occurred in equal frequency in both groups of vignettes. Somewhat surprisingly, but consistent with the findings of Chapter 3, there was no significant correlation between children's gross agitative activity, minor agitative activity or mouthing and their teacher-rated hyperactivity. Finally, connected comments were only related to impulsivity when the content was not too intense (i.e., V2456).

Overall, as predicted, V1378 brought out systematic relations between children's behavioural responses and their social adaptation. Thus, it appears that the emotionally challenging vignettes elicit behavioural responses that correspond more closely to how children manage themselves in everyday challenges and social interactions compared to the less intense vignettes. Furthermore, this basic pattern holds up even when the neutral vignette (vignette 6) is removed from the V2456 combined score.

Finally, to test for the specificity of the relation between children's behavioural responses during challenging events and their social adaptation,

behavioural responses during the neutral vignette (vignette 6) were examined. There were no significant correlations between disengagement in vignette 6 and children's social skills, social maturity or their problem behaviours and impulsivity, providing support for the specific relation between disengagement during emotionally challenging events and social adaptation. Furthermore, there were no significant correlations between children's minor agitative activity and mouthing during the neutral vignette and their impulsivity. There were too few inappropriate comments made in individual vignettes to test for the specificity of this finding.

Table 4.6  
Correlations between behavioural responses and social adaptation

|   | Social Maturity | Social Skills | Problem Behaviours |                        |       |
|---|-----------------|---------------|--------------------|------------------------|-------|
|   |                 |               | Total              | Hyperactivity Subscale | TRIS  |
| Disengagement <sub>V1378</sub>            | -.35**          | -.33**        | .21*               | .17                    | -.03  |
| Disengagement <sub>V2456</sub>            | -.25**          | -.21*         | .04                | .06                    | .01   |
| Gross agitative activity <sub>V1378</sub> | -.02            | -.12          | .12                | .09                    | .12   |
| Gross agitative activity <sub>V2456</sub> | .10             | -.02          | .00                | .01                    | .11   |
| Minor agitative activity <sub>V1378</sub> | -.15            | -.12          | .06                | .11                    | .31*  |
| Minor agitative activity <sub>V2456</sub> | -.06            | .01           | -.07               | -.01                   | .05   |
| Mouthing <sub>V1378</sub>                 | -.02            | -.05          | .06                | .14                    | .51** |
| Mouthing <sub>V2456</sub>                 | .02             | -.05          | -.02               | -.06                   | .27*  |
| Connected comments <sub>V1378</sub>       | -.01            | -.01          | .12                | .15                    | .22   |
| Connected comments <sub>V2456</sub>       | .00             | -.07          | .12                | .18                    | .36** |
| Inappropriate comments <sub>V1378</sub>   | -.14            | -.22*         | .33**              | .38**                  | .68** |
| Inappropriate comments <sub>V2456</sub>   | -.03            | .02           | .06                | .16                    | .21   |

\* $p < 0.05$ , \*\*  $p < 0.01$ . Note: TRIS = teacher-rated impulsivity scale (N = 62); V1378 = Total duration across vignettes 1, 3, 7 and 8; V2456 = Total duration across vignettes 2, 4, 5 and 6.

Children's social adaptation was also examined by affect group (see Table 4.7). Both social skills and problem behaviours were marginally significantly related to affect group. Contrasts indicated that, as expected, children expressing sadness had significantly higher social skills and lower levels of problem behaviours when compared to children expressing worry-concern. Furthermore, there was a significant difference in children's social maturity by affect group. Contrasts

indicated that children expressing sadness had greater social maturity than children expressing either worry-concern or those who were inexpressive. There was no significant difference in children's impulsivity by affect group.

Table 4.7

Mean (standard deviations in parentheses) of study variables by affect group, ANOVA *F* value and significant contrasts with sadness as the reference category

|                    | <i>n</i> | Affect Group                     |                                    |                             | F-value           | Contrasts        |
|--------------------|----------|----------------------------------|------------------------------------|-----------------------------|-------------------|------------------|
|                    |          | Inexpressive<br>( <i>n</i> = 45) | Worry-Concern<br>( <i>n</i> = 34 ) | Sadness<br>( <i>n</i> = 34) |                   |                  |
| Social skills      | 110      | 42.66<br>(10.70)                 | 38.33<br>(14.06)                   | 44.79<br>(11.45)            | 2.49 <sup>†</sup> | S > W*           |
| Problem behaviours | 110      | 10.57<br>(6.78)                  | 13.03<br>(8.49)                    | 8.90<br>(6.36)              | 2.73 <sup>†</sup> | S < W*           |
| Social maturity    | 110      | 28.39<br>(8.23)                  | 27.15<br>(8.88)                    | 32.85<br>(9.49)             | 3.88*             | S > W*<br>S > I* |
| TRIS <sup>a</sup>  | 62       | 8.56<br>(2.76)                   | 9.56<br>(3.72)                     | 8.00<br>(2.90)              | 1.14              | –                |

\*  $p < 0.05$ . \*\*  $p < 0.01$ . <sup>a</sup> inexpressive  $n = 27$ , worry-concern  $n = 16$ , sad  $n = 19$ ; Note: I = inexpressive, W = worry-concern, S = sad,

#### 4.4 Discussion

The current study aimed to replicate and expand upon the findings presented in Chapter 3. In Chapter 3, only one emotional vignette was examined whereas the current study examined children's behavioural responses across multiple vignettes of differing emotional content. A greater number of vignettes were introduced in order to contrast children's responses to different narratives selected on theoretical grounds, and to examine the stability of children's behavioural responses across a series of different emotional events. A number of important findings emerged for the current analyses that extend and support the findings presented in Chapter 3. First, children's behavioural responses were strongly related to specific events in the first day vignette (vignette 3). Second, different vignettes elicited predictable patterns of behavioural responses across all children. Third, expressions of worry-concern and sadness were characteristic of specific children and, in the case of sadness, highly contextually bound. Fourth, there was robust stability in behavioural responses across different emotion eliciting events, and these responses were

relatively independent. Finally, disengagement and affective responses were related to children's social adaptation. Overall, these findings offer some clarification on the meaning and function of specific behavioural responses to challenging emotional events. In the following section the specificity of children's behavioural responses both within and across vignettes is discussed.

***Behavioural responses within and across vignette***

The specific pattern of children's behavioural responding across the events of the first day vignette provides support for the meaningful relation between behavioural responses and the vignette content. Furthermore, this finding substantiates and confirms the predictions made in Chapter 3 regarding the meaning and function of specific behavioural responses using a different but thematically related vignette. Additionally, this chapter compared children's behavioural responses across multiple vignettes with different emotional themes.

In Chapter 3 it was shown that children's disengagement was closely related to the content of the emotionally challenging vignette. Thus, increasing distress in the protagonist elicited elevated disengagement in the context of the mother-infant separation; an empathy inducing event for many children. Similarly, in the current study, children relied heavily on disengagement when the protagonist of the first day vignette showed clear and sustained distress. When comparing children's use of disengagement across different negatively valenced vignettes, as predicted, children showed greatest disengagement in the vignette that depicted the protagonist in distress without a contextual source. The least disengagement was observed in the context of fear and anticipatory anxiety during vignette 8, this vignette was expected to result in the greatest amount of attentional capture due to its compelling narrative.

Gross agitative activity, and to a lesser extent, minor agitative activity also showed a meaningful relation to the content of the first day vignette. Confirming the findings of Chapter 3, both gross and minor agitative activity were observed to decrease in anticipation of the protagonist's distress, which may reflect an orienting response toward potentially distressing stimuli. Furthermore, when comparing across different emotional vignettes, both gross and minor agitative activity

decreased during the fear vignette compared to the first day vignette. This finding suggests that agitative activity decreases in the face of a compelling, anxiety inducing narrative and fits comfortably with the literature that suggests that children's ability to inhibit movement when necessary is indicative of well-regulated responding (Eisenberg, et al., 2001; Eisenberg, Michalik, et al., 2007, see also Chapter 2, Section 2.2.1). Conversely, mouthing, as expected given the findings of Chapter 3, appeared unrelated to the eliciting context. Furthermore, mouthing was elicited at a comparable rate across different challenging vignettes. Taken together the findings of the epoch analyses and the vignette comparisons suggest that mouthing is a stable temperamental disposition.

In the current study, children's communicative bids were further analysed to allow an examination of the verbal content of these bids. Children's communicative bids were divided into those comments that were relevant and connected to the content of the challenging vignette, and those that were inappropriate to this content. Overall, children's verbal comments were relatively infrequent, however, there was evidence to suggest that children made a greater number of connected comments in those vignettes that had an emotionally engaging narrative, especially those vignettes that included a degree of anticipation, such as the fear vignette (vignette 8). Inappropriate comments, on the other hand, appeared to be unrelated to the content of the emotional vignette and were elicited at a similar level across all eight vignettes.

Finally, the pattern of children's expressions of worry-concern and sadness suggested that these expressions were highly context specific, and were strongly characteristic of individual differences between children. Examining these expressions within the first day vignette showed that, as expected, expressions of worry-concern tended to precede clear manifestations of distress in the vignette protagonist, whereas expressions of sadness increased as a consequence of the distress expressed by the protagonist. It was hypothesised that the content of first day vignette (vignette 3) and, to a lesser extent, the fear vignette (vignette 8) were likely to be empathy inducing. When comparing worry-concern and sadness expressions across different contexts, expressions of sadness were found to be more

likely in vignettes that were expected to elicit empathy in young children (vignette 3 and 8). By contrast, expressions of worry-concern were seen more broadly across a range of emotionally challenging vignettes. This finding further supports the prediction that expressions of sadness are indicative of empathic responses compared to expressions of worry-concern and, to some extent, is in line with the findings of Eisenberg et al., (1988) regarding children's behavioural responses to an empathy inducing vignette.

The findings of the epoch analyses and the comparison of children's responses across different vignettes supports the predictions and interpretations of specific behaviours presented in Chapter 3. The current chapter, however, also extends these findings by examining the stability and relation of behavioural responses across different vignettes.

#### ***Stability and independence of behavioural responses***

In Chapter 3, children's responses across different events of the same vignette were found to be stable. The current study extended these findings by examining the stability of children's behavioural responses across a series of different emotionally challenging vignettes. When examined across all eight vignettes, children's behavioural responses showed a high degree of internal consistency. Thus, despite the robust contextual specificity of children's behavioural responses, there was a high degree of stability observed in almost all behaviours across different contexts. This finding highlights the difficulty in making a distinction between children's temperamental responding and their emotion regulation elicited by a specific event. Nonetheless, there was a big difference in the extent to which certain behaviours were context specific. As outlined above, those responses that were stable but non-context specific are likely to represent individual differences in children's dispositional response tendencies. Such dispositional differences are a very good candidate for indices of temperamental differences. Nevertheless, those behaviours that were more context specific could also, ultimately, be linked with temperament, particularly given their stability across vignettes.

Stability of behavioural responses was also closely examined across the four challenging vignettes of interest. These vignettes were chosen because they shared

strong affective themes (e.g., sadness, loneliness and fear) and, of these vignettes, three included a protagonist displaying clear emotional distress. Nevertheless, they were in no way similar in terms of the central emotional themes or protagonist. Given the enormous variation between the content of vignettes 1, 3, 7 and 8, there was considerable consistency in children's use of disengagement, gross agitative activity, mouthing and connected comments. Minor agitative activity and inappropriate comments, however, did not appear to be as stable a behavioural response across the challenging vignettes, although these behaviours were only observed in a small number of children. The extant literature, for the most part, has had mixed findings regarding the consistency of children's behavioural responses across different emotion eliciting contexts (e.g., Eisenberg, Fabes, et al., 1988; Grolnick, et al., 1996; Miller, et al., 1996). Some studies, like Miller et al. (1996), have found that children's responses (i.e., expressions of worry-concern) are stable across different eliciting situations. Whereas others, such as Grolnick et al. (1996), have only found stability in behavioural responses when the challenging events are very similar. The current study, in addition to the findings presented in Chapter 3, suggests that children's behavioural responses are relatively consistent across a range of different challenging events. Notwithstanding this consistency, it is important to emphasise that individual stability became very impressive when the eight vignettes were simultaneously considered (Table 4.3); that is, increased sampling of children's behavioural responses spoke to stable individual differences across a range of situational contexts.

Despite the relative stability of children's behavioural responses to different emotional events, there was one notable exception; expressions of sadness did not appear to be a stable response across different situational contexts. Instead, sadness appeared to be highly context dependent. In those vignettes where an expression of sadness was unlikely (V2456), sadness was observed in less than 6% of children. This result is unsurprising given the context specific nature of affective responses, which was discussed in detail in Chapter 1. In contrast, worry-concern was observed more consistently across vignettes. The differing nature of children's expressions of worry-concern supports predictions that this affective response is indicative of personal

distress and the absence of empathy, at least in the situational contexts examined. The majority of vignettes presented in the current study were not considered a priori to elicit empathy; as such, greater worry-concern in these vignettes is to be expected. These findings provide further support for the expression of sadness as indicative of empathy, whereas the expression of worry-concern appears to be indicative of personal distress or anxiety, which can be observed in a variety of contexts.

The current findings regarding the stability of sadness and worry-concern may, at first, appear at odds with the findings presented in Chapter 3. Chapter 3 found that sadness was stable across the transitional and separation epochs, whereas worry-concern was not. The difference may be explained by the comparison method utilised across the two analyses. In Chapter 3, expressions of affect were examined at intervals throughout the same vignette, while the present study focused on the stability of behaviours across distinct vignettes, with different emotional themes. Thus, although worry-concern does not appear to be stable across non-emotional and emotional events in the same vignette, it was stable across a range of emotional situations. Overall, the findings regarding the stability of behavioural responses provides support for the current practice of aggregating behavioural responses across different emotionally challenging events. However, this practice does not appear to be suitable for expressions of affect, in particular expressions of (empathic) sadness, unless, of course, such affective responses are elicited across a number of similarly themed, empathy inducing vignettes.

In addition to an examination of the stability of behavioural responses across vignettes, the relation across different behavioural domains was also examined. Consistent with the findings presented in Chapter 3, the current study found few relations across different behavioural responses, and overall, different behavioural responses were highly independent. The only consistent relation amongst behavioural responses was between children's disengagement and their affective expressions, and this relation was moderated by sex. High levels of disengagement were associated with expressions of worry-concern for girls and inexpressivity for boys. This pattern of findings was also observed, as a trend, in Chapter 3. Research

on gender differences in children's emotion expressions generally show that girls are typically more likely to express emotions while boys tend to inhibit emotional responses (Eisenberg, Fabes, et al., 1988; Fuchs & Thelen, 1988; Saarni, 1999). However, it is noteworthy that both boys and girls who expressed sadness disengaged from the emotionally evocative events for the least amount of time.

Regarding the relation between children's disengagement and their affective expressions, in the current study, well-regulated children were more likely to express sadness. Eisenberg and Fabes (1992) argue that more adaptive regulation allows children to respond to another's emotional distress with empathy. The current findings provide further evidence that sadness constitutes an empathic response to another's distress. Gill and Calkins (2003) also found an association between children's regulation and their affective expressions, toddlers who had greater physiological regulation during simulated experimenter distress were less likely to express worry-concern, providing additional evidence that expressions of worry-concern are associated with poorer emotion regulation. Overall, the relation between expressions of sadness and children's disengagement confirms the predictions made in Chapter 3, and supports the close association between empathy and emotion regulation. In the final section of this discussion, the relation between behavioural responses to the vignettes and social adaptation is explored.

#### ***Behavioural responses and social adaptation***

Extending the findings presented in Chapter 3, the current study examined the relation between different behavioural responses and children's social adaptation, employing teacher ratings of socially competent and problem behaviour in place of maternal ratings. It was expected that teachers would provide more sensitive and accurate ratings of children's social adaptation compared to maternal ratings (as used in Chapter 3). In Chapter 3, only disengagement was systematically related to children's social adaptation, and the association between disengagement and social competence was also found in the current study. In addition, however, children's inappropriate comments and affective responses were also related to their social adaptation.

Specifically, children's use of inappropriate comments during the emotionally challenging vignettes was consistently related to their social skills, maturity and problem behaviours. Children's inappropriate comments may signify a reluctance to engage with the emotionally challenging event, or an attempt to minimise its significance. Although, there was relative consistency in children's use of inappropriate comments across all eight vignettes, only inappropriate comments in those vignettes that were challenging (V1378) were related to social adaptation. In particular there was a strong association between impulsivity and inappropriate comments, suggesting that those children who make inappropriate comments are more impulsive and, as a result, less well-regulated.

In contrast, connected comments were found to be unrelated to children's social adaptation, a finding that is somewhat surprising given the focus in the literature on connected comments during social interactions (e.g., Dunn & Cutting, 1999; Slomkowski & Dunn, 1996). Together, the findings for both connected and inappropriate comments must be interpreted cautiously. Although there were many communicative bids made overall during the vignettes, they were observed in only a small proportion of children, approximately 70% of all children did not make any communicative bids during the eight vignettes. This may be because some children elected to wear headphones during the emotion elicitation paradigm and these may have impeded verbal communication with the experimenter. Secondly, the manner in which verbalisations were responded to by the experimenter may also have signalled to the child that communicative bids were undesirable during the emotion elicitation paradigm. Thus, the paradigm employed in the current study was not designed to elicit a great deal of communication between the experimenter and the child and, furthermore, when the child did initiate communication the experimenter was relatively unresponsive. In order to more reliably examine the relation between children's emotion regulation, communicative bids and social adaptation, a paradigm that generates a greater number of comments is needed. The content and nature of children's comments during emotionally challenging vignettes is an interesting domain for future research.

An interesting cluster of behaviours emerged in relation to children's teacher-rated impulsivity. Higher levels of minor agitation, mouthing and inappropriate comments were all related to impulsivity, and this pattern of relations was more robust when assessed in emotionally challenging vignettes (V1378). Given the stability of these behaviours across different eliciting contexts and their consistent association with children's impulsivity, this cluster of behaviours appears tap an aspect of children's temperament, which is probably closely aligned to effortful control (Rothbart & Sheese, 2007). Furthermore, associations across behavioural domains supports this grouping of behaviours, with minor agitative activity positively associated with inappropriate comments. By contrast, gross agitative activity and disengagement were not related to impulsivity, nor were they related to the behaviours that clustered with impulsivity.

Turning to the relation between children's disengagement and their social competence, the findings presented in this chapter extend and support those shown in Chapter 3. Children observed using greater disengagement were rated by teachers as having fewer social skills and higher levels of problem behaviours, in addition to being socially less mature. That is, children disengaging *less* from the emotionally evocative events appeared better regulated. This general pattern of findings was most robust when disengagement was assessed during the emotionally challenging vignettes (V1378). Furthermore, when disengagement was examined in the neutral vignette only, no relation between disengagement and social adaptation emerged, even though children exhibited a comparable amount of disengagement across both types of vignette (see Section 4.3.6). This finding provides further support for the specific relation between disengagement observed under emotionally challenging circumstances and children's social adaptation (Cortez & Bugental, 1994).

As expected, children expressing sadness in vignette 3 had higher levels of social skills and lower levels of problem behaviours compared to children expressing worry-concern, in addition to being rated as more socially mature compared to either children expressing worry-concern or those children who were inexpressive. The relation between expressions of sadness and social adaptation is consistent with the work of Strayer and Roberts (Roberts & Strayer, 1996; 1997) showing that

children expressing sadness to emotionally evocative vignettes were found to be empathic and prosocial (see also Eisenberg, Fabes, et al., 1988). Furthermore, in a study investigating the relation between toddlers affective expressions and problem behaviours, Gill and Calkins (2003) found that children with behavioural problems were more likely to show worry-concern during simulated experimenter distress compared to typical children.

Overall, the findings of the current study suggest that expressions of sadness in the context of an empathy eliciting event correspond to an empathic affective response, whereas expressions of worry-concern appear to be indicative of children's personal distress. This conclusion and the results of the current study, are less clear, however, when contrasted against the work of Eisenberg and colleagues (e.g., Eisenberg & Fabes, 1990; 1995) and the work of Cole and colleagues (1996).

Research by Eisenberg and colleagues typically suggests that expressions of worry-concern are associated with empathy and social adaptation (Eisenberg & Fabes, 1990, 1995; Miller, et al., 1996). However, a close examination of the work of Eisenberg and colleagues shows that both expressions of sadness (e.g., Eisenberg, Fabes, et al., 1988; Gurthrie, et al., 1997) and worry-concern (e.g., Eisenberg, 2000b; Eisenberg, et al., 1989) have been found to be associated with empathy in different situations. A resolution of this conflict may lie in the different eliciting contexts employed across studies. For example, paradigms that involve personal injury, including both simulated injury (parent or experimenter) or observed peer injury appear to elicit worry-concern as an empathic response (e.g., Hastings, et al., 2000; Miller, et al., 1996). In this context, worry-concern is an appropriate response. In fact, it is likely that young children are socialised to respond to another's physical injury with concern. As a result, expressions of worry-concern in these contexts appear to correspond with empathy. However, in studies where children are exposed to another's emotional plight (e.g., Eisenberg, Fabes, et al., 1988; Strayer, 1993) expressions of sadness appear to correspond with empathy.

Turning now to the work of Cole et al. (1996). They found that preschoolers expressing concern during a series of challenging vignettes were well-regulated and had lower levels of problem behaviours, compared to those children expressing

negative affect. There are, however, two notable differences between the current study and that conducted by Cole et al. First, Cole et al summed children's expressed affect across distinctly different (negative) emotion eliciting vignettes, thus losing the specific connection between the child's affective response and the eliciting context. There may be a crucial difference between specific empathic affective responses to a single event and more global expressions of negative affect. The findings of the current study, as well as those of Eisenberg et al (1988) and Roberts and Strayer (1996), suggest that children expressing sadness to a specific empathy eliciting event are more socially competent. The findings of Cole et al. (1996), conversely, are more aligned with work examining children's temperamental predisposition toward negative emotion, which suggests that negative emotionality is linked to poor social functioning (e.g., Eisenberg, et al., 1997). This difference highlights an important distinction between expressions of sadness in general, and an expression of sadness in an empathy eliciting situations. The second point of divergence is the manner in which the emotion eliciting scenarios are presented. Cole et al. presented children with narrated still images, while the current study presented children with videos of emotionally distressing events. As outlined in Chapter 2, the degree to which children express affective empathy depends highly on the method used to elicit it (Eisenberg & Miller, 1987). In particular, inconsistent relations between empathy and prosocial behaviours emerge when affective empathy is elicited by tasks with low levels of emotional involvement. Thus, the methodological differences between the current study and that of Cole et al. makes it difficult to directly compare the meaning of children's affective responses.

### ***Conclusions***

The findings presented in the current chapter demonstrate the complexity of children's behavioural responses to emotionally challenging events. Patterns of relations amongst different behavioural responses were found to be dependent on the emotion eliciting event. Furthermore, associations between different measures of children's social adaptation and their behavioural responses to emotional events were also contingent upon the content of the emotional event. Thus, a simplistic model of children's experience of emotion which equates specific behaviours (e.g.,

disengagement, agitative activity, affective expressions) with more or less adaptive responding is inherently problematic (Sroufe, 1995; Thompson & Calkins, 1996). The findings of the current study strongly suggest that a close examination of the eliciting context is critical when attempting to understand the meaning of children's behavioural responses and their relevance for social adaptation. Nevertheless, there was remarkable stability in children's behavioural responses that suggests that many of the behaviours assessed in the current study are temperamental characteristics of the young child's general responding. It is clearly difficult to determine whether a specific behavioural response is indicative of the child's temperament or their emotion regulation, but in the current chapter it was shown that behavioural responses that were specifically elicited by challenging events were meaningfully related to social adaptation.

Despite the large range of behavioural responses assessed in the current study, the findings suggest that children's disengagement and affective responses are specifically elicited in response to challenging emotional content and are, therefore, most relevant to the study of emotion regulation and empathy, as well as children's social adaptation at school. From a theoretical standpoint, it is also these domains of behavioural responding that have been of most interest in young children (see Chapter 2). Thus, disengagement and affective expressions (worry-concern and sadness) will be examined in more detail in remaining chapters. Whilst the empirical pursuit of the other behavioural domains specified in Chapters 3 and 4 is undoubtedly of interest, it is beyond the scope of the current thesis. In the following chapter, the physiological correlates of children's disengagement and affective expressions are examined.

## Chapter Five

### Emotion Regulation, Empathy and Heart Rate Variability

#### 5.1 Introduction and aims

The current chapter aims to investigate the physiological correlates of children's emotion regulation and affective empathy, with a specific focus on the relation between children's heart rate variability and expressions of worry-concern, expressions of sadness and disengagement during emotionally challenging events. In addition, the relation between children's heart rate variability and teacher-rated social adaptation is examined. In Chapters 3 and 4, it was observed that certain child behaviours were closely linked to specific content in emotionally evocative vignettes and, furthermore, were associated with children's social adaptation. Thus, greater disengagement was observed during events that were emotionally challenging, and the degree to which children disengaged from these challenging events was related to their social adaptation. Regarding children's affective expressions, worry-concern and sadness were also observed more frequently, as would be expected, during challenging vignettes, and sadness was particularly prevalent during a vignette designed to elicit empathy. Furthermore, expressions of worry-concern during an empathy eliciting vignette correspond to poorer social adaptation, while expressions of sadness corresponded to more adaptive social functioning. In the current chapter, children's behavioural responses to challenging events are examined in relation to their heart rate variability in order to ascertain if these responses are meaningfully associated with specific patterns of physiological responding.

As outlined in Chapters 1 and 2, children's emotion regulation and empathy have been successfully indexed by physiological markers. In particular, children's heart rate variability has been found to reliably differentiate individual differences in children's expression and regulation of emotion (Appelhans & Luecken, 2006; Eisenberg & Fabes, 1990; Eisenberg, Fabes, Murphy, et al., 1996; Fabes, et al., 1990; Gottman & Katz, 2002; Porges, 1996, 2001, 2011). Heart rate variability (HRV) refers to beat to beat changes in heart rate which reflect parasympathetic activity in the nervous system. A commonly used index of heart rate variability is *vagal tone*

(Porges, 2001, see also Chapter 2). High variability in heart rate is considered indicative of adaptive and effective emotion regulation, and empathic responses. Lower variability in heart rate is suggestive of maladaptive emotion regulation and low levels (or an absence) of empathy (Pumprla, et al., 2002).

In addition to global associations between HRV and children's emotion regulation and empathy, specific relations between HRV and patterns of children's behavioural responses to challenging events have also been explored. In particular, research examining the relation between children's affective responses, as an index of both empathy and emotion regulation, and HRV has been fruitful. In studies of infants, five-month-olds with greater HRV were more likely to express interest and joy during a stranger approach paradigm (Stifter, et al., 1989). In addition, Fox (1989) found that five-month-old infants who expressed greater affect in both positive and negative situations had greater concurrent HRV, as well as greater HRV at 14 months of age. Furthermore, those children at 14 months with greater HRV were more sociable to an unfamiliar adult. In early childhood, there are similar relations between HRV, affective responses and social conduct. For example, Kagan et al. (1989) found that four year olds with high HRV expressed greater affect and were behaviourally uninhibited across a series of challenging situations (e.g., interactions with a stranger, novel toy). In contrast, children with low HRV tended to be shy and fearful during both social and non-social interactions. Finally, preschoolers who expressed greater affect during exposure to an angry interaction between two adults showed greater HRV while those children who expressed less affect had lower HRV in this context (El-Sheikh, Cummings, & Goetsch, 1989). Together, these studies suggest that children who are more emotionally expressive are likely to have greater HRV, while those children who are more inhibited in their expressive responses are likely to have lower HRV.

In addition to studies examining relations between HRV and children's affective responses in general, a small number of studies have examined the relation between specific affective responses and children's HRV. Given established relations between expressivity and HRV, it is to be expected that variations in children's specific affective responses when faced with an emotional challenging event should

be related to physiological processes (Campos, et al., 1994; Cole, et al., 1996; Eisenberg, Fabes, et al., 1988; Eisenberg, et al., 1989). As outlined in Chapters 1 and 2, the empathy literature has had difficulties distinguishing between expressions indicative of personal distress and those indicative of empathic sadness. In some studies, expressions of worry-concern are considered empathic (e.g., Hastings, et al., 2000), while in others, it has been expressions of sadness that have been considered indicative of empathy (e.g., Eisenberg, Fabes, et al., 1988; Strayer, 1993). Leaving aside issues of context discussed in Chapter 2, which complicates any simple mapping of one expression onto a complex emotional attitude (e.g., empathy, distress), an examination of children's HRV may help elucidate the relation between specific expressions and empathic responses.

Fabes, Eisenberg and Eisenbud (1993) propose that specific relations between children's expressive responses to emotionally challenging events and their HRV can help distinguish between expressive response that are indicative of poor regulation and personal distress, and those expressions suggesting the child is emotionally well-regulated and empathic (see also Eisenberg & Fabes, 1992; Liew, et al., 2003). Fabes et al. argue that those children who have greater HRV have a greater ability to regulate their arousal and are, therefore, likely to express empathy. Conversely, those children with low HRV are more poorly emotionally regulated and are likely to display facial affect indicative of personal distress because of their reduced ability to regulate arousal (Fabes, et al., 1993; Ungerer, et al., 1990).

To examine the relation between specific affective responses, empathy and HRV, Fabes et al. (1993) showed school-aged children an emotionally evocative film about two children who are fearful of a stranger outside their home. They found that, for boys, HRV was positively correlated with facial concerned attention, which comprised expressions of both worry-concern and sadness, suggesting that this expression was indicative of empathy for the frightened children's plight. Whereas for girls, lower HRV was associated with display facial markers of distress, such as mouthing, suggesting that these responses were indicative of personal distress. In another study examining the relation between specific affect and HRV, Cole et al. (1996) presented a series of emotional vignettes to children as pictures with

accompanying narratives. While there was no relation between children's overall HRV when assessed across the vignettes and their expressions of worry-concern or expressions of negative affect, there was a difference in baseline HRV across different affective responses. Using a categorical index of affective responding based on children's predominant affect across the story-vignettes, Cole et al. (1996) found that children expressing negative affect had greater HRV. Negative affect in this case comprised of expressions of sadness, anger or fear. Children who were inexpressive during the emotional story-vignettes had the lowest HRV, consistent with the findings that inhibited children have low HRV (e.g., Kagan, et al., 1989). Finally, those children expressing worry-concern had moderate HRV. Taken together, using an overall duration measure of affective responding (Fabes, et al., 1993) and a categorical index based on dominant affect (Cole, et al., 1996), both studies provide some evidence of a significant association between expressions of sadness and greater HRV.

Given the findings of Fabes et al. (1993) and Cole et al. (1996), it appears that children's HRV can serve as a useful measure to help distinguish between different modes of affective responding to emotionally challenging events. The studies outlined in Chapters 3 and 4 found that children who responded to the emotional vignettes with sadness relied less on the emotion regulation strategy of disengagement and were rated as more socially competent, suggesting that these children are emotionally well-regulated. In contrast, children who expressed worry-concern were more likely to use disengagement during the emotionally challenging vignettes and had higher levels of problem behaviours, suggesting that this mode of responding is indicative of poor emotion regulation. In order to further investigate the relation between children's affective expressions and their emotion regulation the current study investigates the relation between children's HRV and their affective expressions.

Eisenberg and Fabes (1992) provide a framework within which to explore the relation between emotion regulation and empathy (see Chapter 1, Section 1.3.2). They propose that in order for children to respond to another's plight with empathy they must be emotionally well-regulated. Thus, it would be expected that children

with greater HRV (i.e., emotionally well-regulated) would be more likely to express affective empathy. However, it is important to note that emotion regulation is a necessary but not sufficient condition for empathic responding, thus, children may be well-regulated but not empathic. Based on the findings presented in Chapters 3 and 4, in addition to the literature reviewed above, it is expected that children expressing sadness will have high levels of vagal tone, whereas children expressing worry-concern are likely to have lower vagal tone.

In contrast to the relation between HRV and affective responding there is considerably less research examining the relation between children's behavioural regulation strategies and their HRV during emotionally challenging events. From the few studies that do examine this relation, most have focussed on the relation between disengagement and HRV. For example, El-Sheikh and colleagues (1994) found that children with lower HRV showed greater disengagement during exposure to an angry interaction. However, other studies have failed to find a significant relation between disengagement and children's HRV (e.g., Cole, et al., 1996; Fabes, et al., 1993; Kagan, et al., 1989). In the current study, therefore, an association is not expected between children's disengagement and their HRV assessed during emotionally challenging vignettes.

Finally, as outlined in Chapter 2, physiological indices have also traditionally been associated with children's socially adaptive and problem behaviours. Preschool and school-aged children with greater HRV during emotionally evocative events are likely to be rated by mothers or teachers as prosocial (e.g., Eisenberg, Fabes, Karbon, et al., 1996; Hastings, et al., 2000; Ortiz & Raine, 2004; Zahn-Waxler, et al., 1995). Conversely, preschool and school-aged children with poorer physiological regulation, that is, lower HRV, tend to experience problem behaviours (e.g., Calkins & Dedmon, 2000; Liew, et al., 2003), although this is not always the case (e.g., Van Hulle, et al., 2000). Thus, in the current study, it is predicted that there will be an association between children's HRV and their teacher-rated social adaptation, although associations are not expected to be robust. Given the findings of Van Hulle and colleagues (2000) less consistent relations between HRV and problem behaviours are expected.

Gender differences in children's physiological responding to emotional and non-emotional events are often reported in the literature, with boys tending to show more robust relations between HRV and outcome measures compared to girls (e.g., Calkins & Dedmon, 2000; Eisenberg, Fabes, Murphy, et al., 1995; Fabes, et al., 1993; Gurthrie, et al., 1997; Liew, et al., 2011). Thus, gender differences in children's HRV responding will also be examined in the current study.

### **Summary**

The current study examines the relation between specific affective responses to different emotionally challenging events and children's HRV as a means to differentiate between expressions of worry-concern and sadness, and elucidate their specific relation to emotionally well-regulated, empathic responding. It is predicted that greater HRV will be related to well-regulated, empathic responses, which on the basis of Chapters 3 and 4 are expressions of sadness. In order to test for the contextual specificity of this relation, sadness in an empathy inducing vignette will be compared to sadness in other emotionally challenging vignettes. There is also evidence to suggest that poor emotion regulation is related to lower HRV, therefore, it is predicted that the expression of worry-concern, which on the basis of Chapters 3 and 4 are considered indicative of personal distress, will be related to lower levels of HRV.

The relation between children's disengagement and their HRV will also be examined, however, based on the extant literature they are not expected to be closely related. Finally, the association between children's social adaptation and their HRV will be explored, although this relation is not expected to be robust.

## **5.2 Method**

### **5.2.1 Participants**

Participants were the same as those presented in Chapter 4 ( $N = 113$ ). However, as is typical of studies where physiological measures are employed, not all data was useable (e.g., Calkins & Keane, 2004). Of the 113 children who participated in the emotion elicitation paradigm, 4 children had ectopic heart beats/arrhythmia, 5 children had errors to over 5% of the data points, and the signal was degraded for a

further 5 children, as such, these data were not included in the current analyses. Furthermore, an additional 4 children did not wish to complete the task with the physiological equipment. Thus, the data for 95 children (48 boys) was used in the current chapter ( $M_{\text{age}} = 67$  months,  $SD = 5.11$  months). There was no significant difference in age between children that were included and excluded from the analyses  $t(112) = .49, ns$ . In addition, to test whether children with behavioural problems were more likely to be excluded from the analyses due to movement artefacts, mean levels of teacher-rated hyperactivity (a subscale of the Social Skills Rating System, see Chapter 4) was compared across children included and excluded from the physiological analyses. There was no significant difference in hyperactivity for children included ( $M = 3.93, SD = 3.32$ ) compared to excluded ( $M = 4.88, SD = 4.12$ ) from the analyses,  $t(109) = 1.04, ns$ .

### **5.2.2 Procedure**

Prior to the Emotion Elicitation Paradigm (see Chapter 4), children were told that while they were watching the video vignettes they would have a 'special' sensor on their finger. If the child objected, then they were able to watch the vignettes without the blood volume pulse (BVP) sensor attached (4% of children). If the child consented, the BVP sensor attached to a Biograph Procomp2 (Thought Technology, 2005) was placed on the child's index finger of the right hand. In order to decrease the likelihood of movement artefacts, it was stressed to all children that it was important for them to keep the hand with the sensor as still as possible and, as necessary, children were reminded to keep the hand still during intervals in the vignette presentation. At the conclusion of the 8 vignettes in the emotion elicitation paradigm, the sensors were removed from the child.

### **5.2.3 Data Calibration and Analysis**

To ensure compliance of the BVP signal, the system was concurrently tested on a pilot subject (female, age = 5 years). The participant was simultaneously attached to a BVP sensor (Thought Technology, 2005) and a conventional laboratory ECG (1000hz, PowerLab 8/30 ADInstruments, 2009), over a 15 minute interval of lying-standing-lying.

The BVP curve was devolved into PP (pulse-to-pulse) intervals using custom software in LabView 9.0 (ADInstruments, 2009), which were used as an approximation of the inter-beat interval (IBI). The dominant frequency of the BVP curve was identified, and periods of interest were defined by single cycles of a phase-shifted curve. The derivative of each interval of the cardiac cycle was analysed for a maximum point of inflection. These intervals were inspected by hand, and errors were corrected to the conformal waveform if possible, or else corrected by linear interpolation if no point of inflection could be identified. BVP traces were deemed as artefacts if greater than 5% of IBIs required interpolation.

The correlation coefficient for RR-interval values between the two difference collection methods (ECG and derived BVP) was 0.997 (Heathers, Kuhnert, Fink, & de Rosnay, 2011). The overall bias was -0.067 milliseconds, with limits of agreement from -11.830 to 11.696 (95% confidence interval). This compares favourably to comparisons between commercially available ECG based systems used in parallel (e.g., Weippert et al., 2010). Figure 5.1 shows the RR series from both collection methods, suggesting a close correspondence between the two methods. Figure 5.2 shows the Bland–Altman plot (averaged beat length X error between beats), which reveals an acceptably small amount of bias with no systematic component. This finding suggests that the use of the BVP-derived vagal tone measure is very reliable when compared to a standard lab based ECG-derived measure (Heathers, et al., 2011; Selvaraj, Jaryal, Santhosh, Deepak, & Anand, 2008).

To convert children's BVP data into vagal tone (VT), IBIs were extracted from the BVP data in the same manner as outlined above, and were then converted to VT according to the procedure outlined by Porges (1985; 1992). Mean VT for the current sample was 6.86 ( $SD = .93$ , range 4.98 – 9.19) and is comparable to other research with children of similar age (e.g., Blair & Peters, 2003; Cole, et al., 1996).

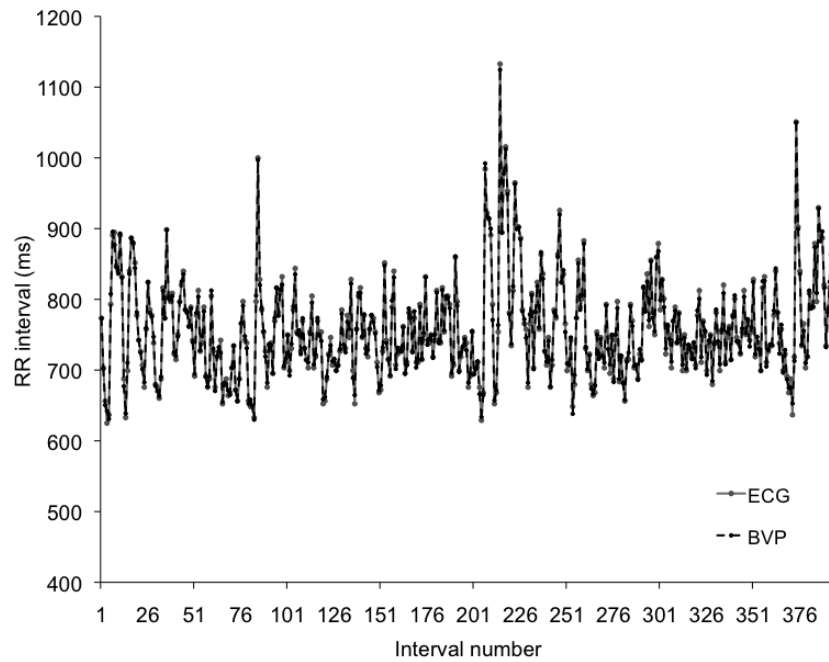


Figure 5.1. RR series from both BVP and ECG collection methods

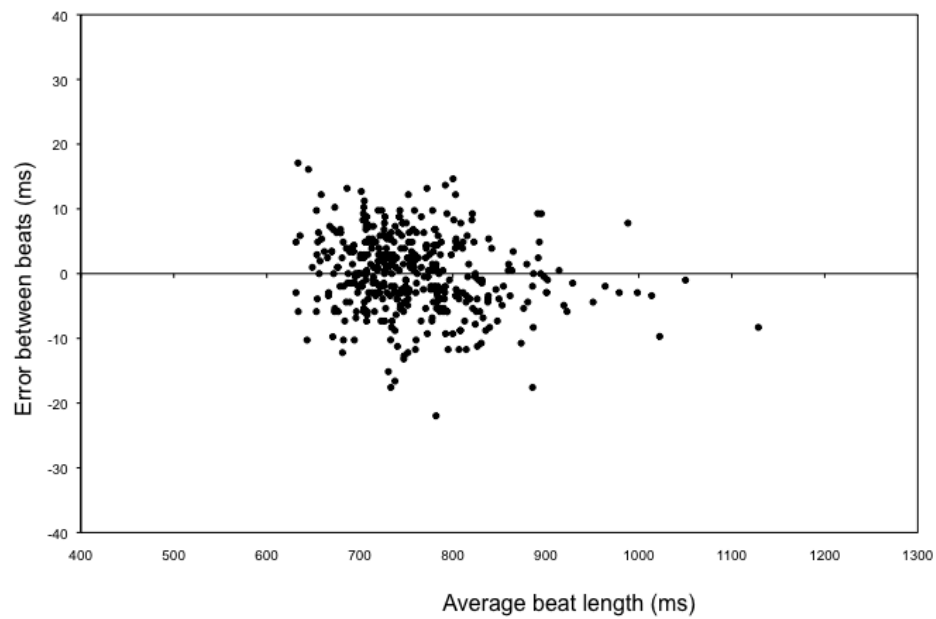


Figure 5.2. Bland Altman plot

### 5.3 Results

First, differences in VT as a function of gender and age are examined, followed by an exploration of the relation between children’s VT and their expressions of worry-concern and sadness in four vignettes from the Emotion Elicitation Paradigm; distressed infant (vignette 1), first day (vignette 3), social

exclusion (vignette 7) and fear (vignette 8) (See Chapter 4, Table 4.1 for vignette descriptions). These four vignettes were chosen based on the findings of Chapter 4. Next, the relation between children's VT and disengagement during emotionally challenging events is examined. Finally, relations between VT and children's teacher-rated social adaptation is investigated.

There was no significant difference in VT between boys ( $M = 7.03, SD = .96$ ) and girls ( $M = 6.68, SD = .88$ ),  $t(93) = 1.82, ns$ , nor was there a relation between children's age and their VT,  $r(95) = -.05, ns$ . As such, these variables are not considered further.

### **5.3.1 VT and expressions of worry-concern and sadness**

To investigate the relation between children's affective responses to the challenging vignettes and their VT, a number of different approaches were taken. First, the relation between the duration of affective responses and VT was examined across the four vignettes from the Emotion Elicitation Paradigm. Second, the relation between children's *dominant* affective response and their VT was explored. Finally, children were categorised according to the absence/presence of sadness or worry-concern, and the relation between these dichotomous variables and VT was examined.

First, there was no significant correlation between children's VT and the duration of their sad expressions in vignette 1, 7 or 8,  $r_s$  between  $-.03$  and  $.11, ns$ . However, there was a significant positive correlation between duration of sadness and VT in vignette 3,  $r(95) = .24, p < 0.05$ , suggesting that children expressing greater sadness during the empathy eliciting vignette (vignette 3) had greater VT. It should also be noted that vignette 3 elicited the greatest amount of sadness from these four vignettes. However, when examining the association between the combined duration of sadness across the non-empathic vignettes (vignettes 1, 7 and 8) and VT, there was still no significant correlation,  $r(95) = .08, ns$ . Nor was there a significant correlation between sadness when summed across all four vignettes and VT,  $r(95) = .11, ns$ . This finding suggests that there is a specific relation between VT and expressions of sadness during an empathy eliciting vignette.

There was no significant correlation between VT and the duration of expressions of worry-concern across any of the four vignettes,  $r_s$  between  $-.14$  and  $.01$ ,  $ns$ . Examining the combined duration of children's expressions of worry-concern across the four vignettes confirmed that there was no significant correlation between worry-concern and VT,  $r = -.12$ ,  $ns$ . Together, these findings suggest that overall duration summed across multiple vignettes of worry-concern and sadness are unrelated to children's VT. However, the duration of children's sadness expressions in an empathy inducing situation is positively correlated with VT, suggesting a degree of contextual specificity in the relation between affective responses and VT.

Next, the relation between VT and children's dominant affective response was examined. Given the findings presented above, only children's affective expressions in response to the empathy inducing vignette (vignette 3) were used to categorise children. As outlined in Chapter 4 children were classified into one of three groups based on their dominant expression to the first day vignette; inexpressive ( $n = 37$ ), worry-concerned ( $n = 30$ ) or sad ( $n = 28$ ). Because categorisation was based on dominant affect some children who were categorised as worry-concerned also expressed a small amount of sadness ( $n = 15$ ) and some children who expressed predominantly sadness also expressed a small amount of worry-concern ( $n = 2$ ; see also Figure 4.7).

Examining differences in VT across these categorisations showed that children who were inexpressive during vignette 3 had a mean VT of  $6.86$  ( $SD = .80$ ), children expressing predominantly worry-concern had a mean VT score of  $6.63$  ( $SD = .89$ ), and children expressing predominantly sadness had a mean VT score of  $7.10$  ( $SD = 1.11$ ). While it appears that children expressing sadness had the greatest VT, these differences were not statistically significant,  $F(2, 92) = 1.86$ ,  $ns$ . A contrast examining the mean difference in VT between children's categorised as worry-concern and sad was marginally significant,  $t(93) = 1.93$ ,  $p = 0.06$ . This result suggests that although there was a significant correlation between expressions of sadness in Vignette 3 and VT, there is no significant relation between children's *dominant* affective response and their VT.

Finally, in order to investigate whether the presence or absence of a given affective response is related to VT, a dichotomous variable was created for sadness and worry-concern. In this manner, neither the duration nor dominant affect is taken into account when categorising children. Thus, the relation between VT and sadness may be examined regardless of whether or not the child also expressed worry-concern, and vice versa. Sixty-five children did not express any sadness and 30 children expressed at least one instance of sadness during vignette 3. A *t*-test to compare these two groups found a marginally significant difference in VT between children expressing sadness ( $M = 7.11, SD = 1.11$ ) and those not expressing any sadness during the empathy eliciting vignette ( $M = 6.74, SD = .85$ ),  $t(93) = 1.79, p = 0.08$ . A similar categorical variable was created comparing the presence and absence of sadness in vignettes 1, 7 and 8, however there was no significant differences in VT between these two groups,  $t(93) = .87, ns$ .

A similar categorical variable was created for expressions of worry-concern in vignette 3, however there was no significant difference in VT between children expressing worry-concern ( $n = 48$ ) and those who did not ( $n = 47$ ),  $t(93) = 1.45, ns$ . There was a marginally significant difference in VT between those children expressing worry-concern ( $M = 6.69, SD = .98$ ) and those who did not ( $M = 7.02, SD = .86$ ) in vignettes 1, 7 and 8,  $t(93) = 1.76, p = 0.08$ .

Given the modest relation between expressions of sadness and increased VT, and the hypothesised relation between poor emotion regulation and lower VT, children expressing worry-concern only were considered separately from those children expressing both worry-concern and sadness. Thus, a final dichotomous variable was created to compare VT in those children expressing exclusively worry-concern ( $n = 32$ ), compared to those children expressing some sadness or those who were inexpressive ( $n = 63$ ). Figure 5.3 shows the mean level of VT for those children expressing worry-concern only, sadness only, or both sadness and worry-concern, as well as those children who were inexpressive in vignette 3. There was a significant difference in VT across these two groups,  $t(93) = 2.26, p < 0.05$ , such that those children expressing exclusively worry-concern had lower VT ( $M = 6.56, SD = .88$ ) compared to the remaining children ( $M = 7.01, SD = .92$ ).

To investigate whether this difference in VT between those children expressing exclusively worry-concern and inexpressive/sad children was specific to an empathy eliciting vignette, the same categorisation was made for children's affective responses to across vignettes 1, 7 and 8. There was a marginally significant difference in VT between those children expressing exclusively worry-concern across the three vignettes ( $M = 6.61$ ,  $SD = 1.07$ ) and inexpressive/sad children ( $M = 6.99$ ,  $SD = .84$ ),  $t(93) = 1.85$ ,  $p = 0.07$ . Again, children expressing exclusively worry-concern had lower VT.

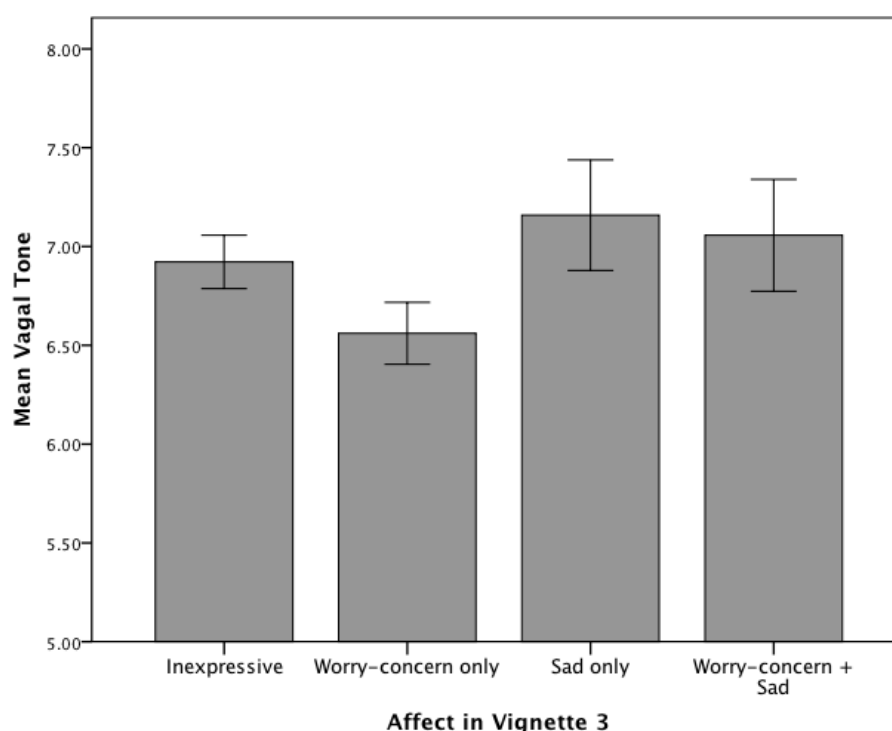


Figure 5.3. Mean level of vagal tone as a function of affective response to vignette 3

**Summary: VT and expressions of worry-concern and sadness**

There was a significant positive correlation between the duration of children's expressions of sadness in an empathy eliciting event and their VT, furthermore, there was a marginally significant association between the presence of sadness in the empathy vignette and greater VT. Notably, however, there was no relation between sadness and VT in any other emotionally challenging vignette. With regards to the relation between VT and worry-concern, there was no significant correlation between children's duration of worry-concern and their VT in any vignette. However, children expressing exclusively worry-concern had lower VT

compared to inexpressive/sad children, and this relation was relatively consistent across all challenging vignettes.

### **5.3.2 Vagal tone and disengagement**

There was no significant relation between VT and children's disengagement during the emotionally challenging vignettes,  $r(95) = .04$ , *ns*.

### **5.3.3 Vagal tone and social adaptation**

There was no significant relation between VT and children's teacher-rated social skills, social maturity or problem behaviours, *rs* between  $-.09$  and  $.07$ , *ns*.

## **5.4 Discussion**

The current chapter investigated the affective and behavioural correlates of children's HRV. First, the current findings broadly suggest that expressions of sadness are associated with greater HRV, while expressions of worry-concern correspond to lower levels of HRV. However, there were a number of qualifications to this general pattern of findings, which are discussed in more detail below. Second, as expected the current chapter found no significant relation between children's HRV and their disengagement during challenging events. Finally, there was no significant association between children's HRV and their teacher rated social adaptation.

Children expressing greater sadness during an empathy eliciting event were found have greater HRV, suggesting that they are more physiologically well-regulated. This finding supports the work of Fabes et al. (1993) and Cole et al. (1996), who also found positive associations between expressions of sadness and HRV (i.e., vagal tone). Furthermore, the relation between HRV and expressions of sadness appeared to turn exclusively on the degree of sadness, as well as to some extent the presence or absence of sadness, rather than sadness as the predominant expression observed during the emotional vignette. Furthermore, in addition to a relation between children's expressions of sadness and greater HRV, there was a specific relation between HRV and the context within which sadness was elicited. Children's sadness during an empathy inducing vignette was uniquely related to HRV, there was no such relation between HRV and expressions of sadness elicited across any of

the other emotionally challenging vignettes when considered alone *or* combined. Thus, it appears that HRV shows a specific relation with expressions of sadness in an empathy eliciting context. This finding may be contrasted to that of Cole et al. (1996) who found that negative affect more broadly was related to children's HRV across a series of different emotionally evocative vignettes. However, as outlined in Chapter 4 (Section 4.4), there are a number of methodological difference between the current study and that presented by Cole et al. Namely, Cole and colleagues examined the relation between HRV and many different negative affective responses, including fear, anger and sadness. Furthermore, these affective responses were summed across multiple emotional situations. As a result, the methodology employed by Cole et al. may obscure the specific pattern of relations found in the current chapter. The vignettes used in the current study did not elicit significant amounts of anger or fear, so it cannot be established how those expressions are related to children's vagal tone.

In addition to a significant association between expressions of sadness and greater HRV, the current chapter also found a significant relation between children's expressions of worry-concern and lower levels of HRV. This finding suggests that expressions of worry-concern are associated with poor emotion regulation and, thus, supports the prediction that this expression is indicative of the child's personal distress. However, the relation between HRV and worry-concern held only for those children who *exclusively* expressed worry-concern. The HRV of children expressing sadness regardless of whether or not it was the child's dominant expression appeared similar to those children expressing sadness exclusively. Thus, it appears that any manifestation of sadness is related to children's HRV, whereas only worry-concern in isolation is related to HRV. This finding fits comfortably within Eisenberg and Fabes' (1992) framework for understanding the relation between emotion regulation and empathy. Children who are emotionally well-regulated are able to experience affective empathy (i.e., sadness) without becoming overly distressed themselves. Thus, any expression of sadness is representative of a capacity for well-regulated responding, and thus greater HRV. However, those children who are poorly regulated do not have the capacity to express any affective empathy. Thus,

those children expressing worry-concern in the absence of any sadness, are expected to have poor emotion regulation and lower HRV.

Unlike the specific relation between expressions of sadness in an empathy inducing situation and HRV, the current findings suggest that the relation between worry-concern and HRV are more broadly defined. That is, the relation between HRV and worry-concern does not necessarily turn on specifically empathy eliciting contexts. This finding supports the predictions of Chapters 3 and 4 that expressions of sadness are highly context specific and are only observed in those vignettes that are expected to elicit empathic responses, while worry-concern expressions are observed more broadly across a range of different emotionally challenging vignettes. Therefore only expressions of sadness in an empathy eliciting vignette provide an insight into children's capacity for empathy and emotion regulation, and consequently their HRV, whereas worry-concern across different contexts are indicative of the child's emotion regulation and HRV.

In contrast to the relation between sadness and HRV, there was no significant relation between children's HRV and disengagement across the emotionally challenging vignettes. This non-significant relation between disengagement and HRV was to be expected given the literature examining specific relations between behavioural indicators of emotion regulation, such as disengagement, and children's HRV (e.g., Cole, et al., 1996; Fabes, et al., 1993; Kagan, et al., 1989). When an association between emotion regulation and physiological responding has been reported in the literature, measures of emotion regulation tend to be more broadly construed than those employed in the current study.

In addition to the non-significant relation between disengagement and HRV, no direct relation was found between children's HRV and their teacher-rated social adaptation or problem behaviours in the current study. The extant literature often reports an association between children's physiological regulation and their social functioning (e.g., Cole, et al., 1996; El-Sheikh, et al., 2001; Hastings, et al., 2000; Ortiz & Raine, 2004; Zahn-Waxler, et al., 1995). Other studies, however, have also failed to find a direct association between children's HRV and their social adaptation. For example, Calkins and Keane (2004) found no simple relation between children's

adjustment and their physiological regulation. Calkins and Keane argue that, by preschool age, regulated responding is multiply determined, thus a relation between physiological indices and socially competent behaviour is likely to be influenced by multiple factors, including care-giving style and temperament (e.g., Fox & Calkins, 2003; Kopp, 1989). Furthermore, earlier regulatory behaviours may impact more strongly on later behaviours, which would imply that concurrent relation between HRV and social conduct would be necessarily modest. Calkins and Keane present evidence for this argument, with children's earlier physiological responding supporting later adaptive responding. The current findings support the argument put forward by Calkins and Keane, and suggest an indirect relation between social behaviours and HRV via expressed affect.

Together with the findings of Chapter 4, it can be seen that children who were more physiologically well-regulated are likely to express sadness during an empathy inducing event, and it was these children who tended to be rated by teachers as more socially competent. Conversely, children expressing worry-concern are likely to have lower levels of HRV, and these children were rated by their teachers as less socially competent and exhibiting greater problem behaviours.

Finally, it should be noted that within the existing physiological literature, there is little agreement on the most robust method for deriving VT and that significant challenges have been made to the use of HRV measures without the control of breathing (Grossman, Karemaker, & Wieling, 1991), the physiological significance of the phenomenon of respiratory sinus arrhythmia on which VT is based (Porges, 1985; Porges & Byrne, 1992) and on the technical suitability of frequency-based methods used to calculate HRV (Clifford & Tarassenko, 2005). It is significant that our method broadly agrees with the initial result of Cole et al. (1996) who used essentially the same frequency based method derived from Porges (1985).

Overall, the current finding provides support for the differentiation of worry-concern and sadness expressions, and furthermore suggests each is associated with a unique pattern of HRV. Given these findings, together with those presented in Chapters 3 and 4, expressions of sadness during the empathy eliciting vignette appear to be indicative of a well-regulated and empathic responding. Conversely,

expressions of worry-concern may be best understood as indicative of children's personal distress when faced with the emotional event, and are related to lower levels of HRV. In the following chapter, children's disengagement and affective expressions are examined simultaneously with understanding of mind and emotion to determine whether they are independent predictors of children's social adaptation.

## Chapter Six

### Emotion Regulation, Emotion Understanding and Social Adaptation

#### 6.1 Introduction and aims

The current thesis is centred on the relation between children's emotional experience –behavioural and affective responses to emotionally challenging events– and their social adaptation. In this chapter, however, children's understanding of mind and emotion is given simultaneous consideration as an additional influence of children's social adaptation. When children encounter an emotionally challenging situation, they likely draw upon both their resources to regulate their emotional arousal as well as their understanding of the unfolding emotional event and its influence on the people experiencing it (Denham, et al., 2003; Halberstadt, et al., 2001; Harris, 2006; Saarni, 1999). Thus, it is widely acknowledged in developmental research and theory that both domains of emotional competence have been argued to be of importance for children's adaptive social functioning (e.g., Denham, 1998; Denham, et al., 2003; Saarni, 1999). To investigate the impact of emotional competence on social adaptation empirically, however, different research traditions have focused on specific features of such competence independently. Thus, the child is typically cast either as someone who experiences emotion or someone who understands it (de Rosnay, Harris, et al., 2008; Harris, 1994). Whereas the former deals with the child's emotional self-regulation and expressive emotional behaviour, the latter takes a cognitive developmental starting point and generally centres on the child's understanding of mind and emotion. This chapter, therefore, examines the simultaneous influence of children's experience of emotion and their understanding of mind and emotion on social adaptation.

Over and above children's understanding of mind and emotion, empathic understanding is also assessed in the current study. As outlined in Chapter 2, there are two main ways that children's empathic responses have been conceptualised. Empathy can be understood as an affective response to another's plight or as a cognitive awareness and understanding of another's emotional condition (Hoffman, 1984). In keeping with these different conceptualisations, some studies examine

children's empathy by measuring their affective responses to emotional events (e.g., Eisenberg & Fabes, 1995; Gurthrie, et al., 1997). However, other studies ask whether children are able to understand emotional events from a protagonist's point of view (Feshbach & Roe, 1968; Strayer, 1993). In Chapters 3, 4 and 5, empathy has been examined as an affective response, with a specific focus on children's expressions of worry-concern and sadness when observing the emotional distress of another. In the current chapter, children's empathic role-taking ability is introduced as a specific aspect of children's more general understanding of mind and emotion.

The first aim of the current study is to investigate the concurrent relations between children's experience of emotion and their understanding of mind and emotion. That is, the association between children's regulatory behaviours (i.e., disengagement), affective responses and understanding of mind and emotion will be explored. To date, these components of emotional competence have largely been studied in isolation of one another.

The second aim of the present study was to examine the independent and combined impact of children's experience of emotion and understanding of mind and emotion on their teacher and peer reported social adaptation during the first year of formal schooling. In Chapters 3 and 4, the relation between regulatory behaviours and affective responses during emotionally challenging events was examined and compared with children's social adaptation. It was shown that children who disengaged less from the emotional vignettes, and those who expressed (empathic) sadness during an empathy eliciting vignette, were more likely to be rated by their teachers as socially skilled and mature. The current study further extends this finding by examining the simultaneous influence of understanding of mind and emotion on social adaptation.

In the following section the empirical literature documenting an independent association between children's understanding of mind and emotion and social adaptation is examined (Section 6.1.1). This is followed by an examination of the different methodologies applied in this chapter for the assessment of children's social adaptation, including teacher and peer report (Section 6.1.2). Finally, the potentially combined (interactive) relation between children's experience of

emotion and their understanding of mind and emotion on social adaptation is explored (Section 6.1.3).

### **6.1.1 Understanding of mind and emotion**

Three aspects of children's understanding of mind and emotion are assessed in the current study; theory of mind, emotion understanding and empathic role-taking. All three aspects have been associated with children's social adaptation. Theory-of-mind (ToM) understanding is the ability to explain and predict behaviours and feelings in others based on a reference to mental states (Astington, 2003; Wellman & Liu, 2004). In preschool and early school-age ToM has been related to children's social adaptation rated by teachers, behavioural measures of social skills (Cassidy, et al., 2003; Wellman, Cross, & Watson, 2001), and social preference as rated by peers (Slaughter, et al., 2002). Such studies suggest that children who are better able to conceptualise the mental lives of others are also better able to negotiate social interactions. At the time very children begin formal schooling there are considerable individual differences in ToM (Wellman & Liu, 2004), and various researchers have pointed to the potential ramifications of such differences for children's social adaptation. However, when children's verbal abilities, which are closely tied to ToM (Astington & Baird, 2005), have been statistically controlled for, putative relations between ToM ability and social adaptation have generally weakened or fallen away (e.g., Cassidy, et al., 2003; Dunn & Cutting, 1999). Thus, it is important to interpret such relations cautiously and also examine the extent to which children's social adaptation is influenced by their verbal abilities. In the current chapter, a comprehensive measure of children's expressive and receptive language abilities will be controlled for in all analyses.

In addition to ToM measures, many studies have assessed the relation between children's understanding of emotion and their social adaptation; including socially skilled behaviour, social status, and friendship interactions (Cassidy, Parke, Butkovsky, & Braungart, 1992; Dunn & Cutting, 1999; Garner, 1996). Emotion understanding (EU) generally refers to the child's capacity to predict and explain emotion in terms of commonly understood folk psychological constructs, such as the relation between desire and emotion, and the correspondence between certain

situations and emotional outcomes (Harris, 1989). While EU defined in this way overlaps with ToM, there is evidence that the two domains, despite covarying with children's verbal abilities, are somewhat independent (e.g., Cutting & Dunn, 1999; Denham, 1986), and they may have different implications for children's social behaviour (Dunn & Cutting, 1999).

Finally, children's empathic role-taking has consistently been argued to influence social competence and support prosocial behaviour (Eisenberg & Mussen, 1989; Iannotti, 1985; Saarni, 1999; Underwood & Moore, 1982), and there are many indications that children with high levels of empathy engage in more prosocial behaviours to alleviate the distress of others (e.g., Eisenberg, 2000b; Roberts & Strayer, 1996; Strayer, 1989). As outlined in Chapters 1 and 2, given the central position of psychological perspective taking within empathy, particularly in complex social interactions, various researchers have treated EU and ToM measures as more or less direct assessments of empathic role-taking ability; sometimes described as cognitive empathy (e.g., Blair, 2005; Underwood & Moore, 1982). However, as articulated by Underwood and Moore (1982), empathy is distinct from ToM and EU because it involves not only the ability to understand another's psychological perspective but also the demonstration of shared affect. Thus, in the current study, the assessment of empathic role-taking hinges on the articulation of shared affect, as well as an ability to demonstrate perspective taking (e.g., Roberts & Strayer, 1996; Strayer, 1989; Strayer & Roberts, 2004b). This approach allowed the possibility to discern whether empathic sentiments expressed by children uniquely contribute to social competence, or whether more general aspects of psychological understanding (i.e., ToM or EU) underpin such competence.

Granted the theoretical and empirical grounds for separately measuring ToM, EU and empathic role-taking, there are also good reasons to expect that these constructs will, to some extent, overlap. Specifically, ToM and EU arguably index children's broader *psychological perspective taking* (PPT), and have sometimes been grouped together under the ToM construct (see Astington & Baird, 2005). It may be that PPT skills have a wide-ranging influence on social adaptation and peer acceptance because they allow children to better understand the concerns,

motivations and intentions of peers (Hughes & Dunn, 1998; Ruffman, Slade, & Crowe, 2002). However, ToM arguably taps a core psychological insight (i.e., false-belief understanding) that has wide-ranging implications for understanding both cognitive and emotional psychological states (Wellman, et al., 2001). By contrast, EU assesses more specific, contextually discrete manifestations of PPT exclusively relating to emotion (see Methods below and de Rosnay, Harris, & Pons, 2008, for a discussion). Furthermore, empathic role taking likely involves PPT skills but, crucially, it also entails the child's articulation of shared affect, which is by no means a necessary extension of understanding another person's psychological perspective. In the current study, therefore, both the combined and independent influences of ToM and EU on children's social competence, problem behaviours and social preference are explored. In addition, the degree of overlap between children's PPT abilities and empathic role-taking is examined.

The simultaneous measurement of different aspects of children's understanding of mind and emotion will allow a direct examination of the specific aspects that are related to children's behavioural measures of emotion regulation and affective empathy. Given the conceptual differences between these components of understanding mind and emotion, it is plausible that each aspect of children's understanding of mind and emotion will be related to emotion regulation and affective empathy in a different manner. In addition, multiple measures of children's understanding of mind and emotion will enable a direct comparison of the impact of ToM, EU and empathic role-taking on social adaptation in the context of behavioural measures of emotion regulation and affective empathy.

### **6.1.2 Social Competence**

There is a necessary dependence on parent and teacher questionnaire measures of social skills and problem behaviours for young children, however, once children enter school, peers are arguably best able to provide a window on social adaptation. Thus, to understand children's social adaptation at school entry, it is ideal to have a valid assessment of their acceptance within a network of classmates (Rose-Krasnor, 1997). In the current study both teacher and peer report measures are employed to obtain a broad understanding of children's social adaptation.

Teachers reported on children's socially competent behaviour by rating the frequency of children's social skilled and problem behaviours (Gresham & Elliott, 1990). Items assessing socially skilled and problem behaviours centred on those behaviours that enhanced or disturbed classroom functioning and social relations with peers. As outlined in Chapter 4, in addition to a skills based measure of children's social competence, teachers were also asked to rate children on a series of social behaviours relative to their peer group (Peterson, et al., 2007). In this sense, in addition to a measure of children's socially skilled behaviour, the relative social maturity of children's social interactions was also obtained.

To tap peer perceptions of social competence, children reported on their preferences for peers; that is, they nominated children who they like and dislike playing with at school. These ratings then form the basis for each child's social preference score. In order to better understand the relationship between children's emotional competence and their peer rated social preference, it is important to examine the extent to which emotional competence has a direct influence on peer perceptions. Of course it is possible that emotional competence underpins children's socially competent behaviour (i.e., social skills, maturity, etc), but that socially competent behaviours are better suited to explaining child characteristics that underpin peer preference. In fact, studies examining both peer preference and teacher rated social competence have shown that children's socially competent behaviours, either as rated by teachers or observed in the playground, were directly related to children's social preference as rated by peers (Denham & Holt, 1993; Ladd, Price, & Hart, 1988). However, few studies have examined the impact of children's emotional competence in addition to the consistent relation between children's social preference and their social competent behaviours. Thus, the extent to which children's emotion regulation and understanding of mind and emotion independently influence children's perceptions of their peers is unresolved. Therefore, this chapter also examined to what extent the emotional competence variables predict social preference once teacher ratings of social competence have been controlled for.

### **6.1.3 The complex nature of children's emotional competence**

It is expected that the current study will replicate findings in the extant literature. Thus, it is predicted that children with more adaptive emotion regulation and affective responses construed as empathic will be more socially competent, have fewer problem behaviours, and be more positively rated by peers. Further, it is expected that better understanding of mind and emotion will be related to socially competent behaviour, as rated by teachers and peers. However, although each domain of emotional competence has been associated with children's developing social competences, the present study assesses the extent to which these various components of emotional competence can be regarded as conceptually or functionally independent correlates of individual differences in social adaptation. It is likely that emotional competence influences children's social adaptation in complex ways. Thus, this chapter also explores how domains of emotional competence (i.e., emotion regulation, understanding of mind and emotion and empathy) might influence children's social competence in combination.

As outlined in Chapter 1, there is a conceptual association between children's understanding of mind and emotion and their emotion regulation. That is, when children encounter a challenging event their understanding of the emotional event helps them to better manage their response (Meerum Terwogt & Olthof, 1989; Stegge & Meerum Terwogt, 2007; Thompson, 1994). Nevertheless, there has been relatively little empirical research investigating the nature of the link between children's skills at managing their emotional response and their understanding of mind and emotion (for exceptions see Cole, Dennis, et al., 2009; Denham, et al., 2003; Schultz, et al., 2001). As noted in Chapter 1, in studies that have focused on the relation between various domains of emotional competence, it has not been clear whether there is any direct concurrent relation between children's understanding of mind and emotion and their emotion regulation (Denham, et al., 2003; Schultz, et al., 2001). These findings suggest that a simple relation between the two domains, whereby higher levels of understanding of mind and emotion correspond with more emotionally well-regulated responding, appears unlikely. Instead, an interactive relation between these domains is more probable. That is,

poor understanding of mind and emotion may magnify the negative association between poor emotion regulation and children's behavioural problems. However, it is important to note that the studies outlined above focus on the relation between emotion regulation and understanding of mind and emotion in a limited developmental window, it is may be that the association between these domains must be examined longitudinally, across development.

Second, while affective empathy and empathic role taking are both measures of empathy, they tap very different skills and behaviours, and it is unclear whether children's responses in the two domains overlap. Although there is an underlying assumption that cognitive tasks tapping empathic role-taking have some relation to the emotions experienced by children when viewing potentially empathy inducing events, it has also been argued in the child clinical literature that *affective* and *cognitive* components of empathy deserve independent treatment (Pardini, Lochman, & Frick, 2003). In keeping with this latter view, it has been shown that typical children are quite poor at reporting on their own affective responses on isolated occasions (Strayer & Roberts, 1997). As such, while there may not necessarily be a relation between affective empathy and empathic role-taking proclivity, it is predicted that both will be robustly related to children's concurrent social adaptation.

### **Summary**

This chapter extends the findings of Chapter 3 and 4 by examining behavioural and affective responses to emotionally challenging events concurrently with children's understanding of mind and emotion. These aspects of children's emotional competence are typically studied in isolation of one another. However, the separation of children's experience of emotion from their understanding of emotion in the empirical literature prevents an examination of the association between these domains, and their simultaneous influence on social adaptation. Thus the first aim of the current chapter was to examine the relations between different domains of emotional competence, specifically the associations between children's disengagement, their affective expressions, and their understanding of mind and emotion. The simultaneous examination of both children's behavioural and affective

responses to challenging events and their understanding of mind and emotion will provide an insight into the influence of children's understanding of mind and emotion on their abilities to manage emotional arousal. The second aim of this chapter was to examine the simultaneous impact of children's behavioural and affective responses and their understanding of mind and emotion on social adaptation. This will allow the separate and combined influence of different domains of emotional competence of social adaptation to be explored.

## **6.2 Methods**

### **6.2.1 Participants**

Participants were the same as those presented in Chapter 4 ( $N = 114$ ).

### **6.2.2 Measures**

#### ***Verbal mental ability***

The Test of Early Language Development-3 (TELD, Hresko, Reid, & Hammill, 1999) was used as an assessment of children's verbal mental ability. The TELD is a measure of both expressive and receptive language skills, which is summed to create a global score. This comprehensive index of language development was chosen because such measures demonstrate stronger relations with children's ToM than measures of specific language abilities such as vocabulary (Milligan, Astington, & Dack, 2007). Children's raw, unstandardised scores were used in the analysis to allow for any age effects to be independently explored ( $M = 60.46$ ,  $SD = 5.16$ ).

#### ***Emotion regulation and affective responses***

Measures of children's disengagement and expressions of worry-concern and sadness were assessed during the Emotion Elicitation Paradigm as presented in Chapter 4. Disengagement scores comprised the total percentage duration of disengagement across vignettes 1, 3, 7 and 8 (see Chapter 4, Section 4.3.5). Children's affective responses comprise a categorical variable denoting the predominant affect expressed during the empathy eliciting vignette only (vignette 3). Children were classified into one of three affect groups; inexpressive, worry-concern or sad in the same manner as described in Chapter 4 (Section 4.3.5).

### ***Understanding of Mind and Emotion***

(i) *Theory of mind (ToM)*. Four false-belief understanding ToM tasks were administered, two unexpected contents items based on Perner, Leekman and Wimmer (1987), and two unexpected transfer items based on Wimmer and Perner (1983). These ToM tasks are widely used and highly reliable (Hughes et al., 2000; Wellman, et al., 2001). In addition, following Hughes et al., two further false-belief questions, integrated into the belief-based emotion attribution tasks described below, were administered. These took the same form as the unexpected transfer items (see Appendix C for materials). Each story vignette was read aloud by the experimenter and supplemented with colour drawings. One point was awarded for correctly identifying the protagonist's false belief or their action based on a false belief. Children received a ToM score from zero to six. Internal consistency for the six false-belief items was high,  $\alpha = 0.78$ .

(ii) *Emotion Understanding (EU)*. Based on the work by Pons and colleagues (2004; 2003) three age-appropriate components of EU were chosen from the Test of Emotion Comprehension (TEC) to assess different emotional constructs: Components III (emotion based on diverse desires), IV (emotion based on ignorance), and VII (understanding hidden emotion). Components IV and VII were supplemented with addition items described below. Children's understanding of emotion based on false belief (Harris, Johnson, Hutton, Andrews, & Cooke, 1989) was also assessed using two tasks with differing emotional outcomes. These are described briefly below.

Component III involved two separate stories in each of which two protagonists held contrasting desires concerning the same object: cola (story 1) and lettuce (story 2). Administration followed Pons et al. (2004) and children were credited with a point for each story if they successfully identified that the two protagonists' emotions—upon receiving the objects—would differ as a function of their desires. Children's scores thus ranged between 0 and 2.

Component IV required children to predict a protagonist's emotion on the basis of an expectation based on his/her ignorance. The TEC item introduces children to a rabbit eating a carrot, which he likes. Unbeknownst to the rabbit a fox is hiding,

waiting to eat him; a fact revealed to children. To pass, children must attribute happiness to the rabbit (contingent on his ignorance), rather than fear.

Administration followed Pons et al. (2004). Children were also given three additional component IV tasks involving different emotion contrasts. In these additional stories children had to attribute fear (versus happiness), happiness (versus sadness) and sadness (versus happiness) to pass. Children's scores thus ranged between 0 and 4.

Component VII required children to identify a protagonist's hidden emotion, which conflicted with his/her overt expression. The TEC item is presented as follows: "Anna is teasing Lucy [depicted with a happy face] because Anna has lots of marbles and Lucy doesn't have any. Lucy tries to hide how she feels inside. She doesn't want Anna to know how she really feels inside". To pass, children have to attribute sadness to Lucy. Children were given three additional component VII tasks involving different emotion contrasts. Thus, they had to attribute sadness (versus happiness), happiness (versus neutrality; i.e., just alright) and sadness (versus neutrality, i.e., just alright) to pass (see Appendix C for materials). Children's scores thus ranged between 0 and 4.

Finally, children were given two tasks, based on the TEC methodology, assessing their understanding of emotion based on false belief (Harris, et al., 1989). These so-called nice and nasty surprise tasks (see Hughes, Adlam, et al., 2000) required children to make an emotion attribution to a story protagonist on the basis of a false expectation. To pass the nice surprise story children had to attribute sadness to the protagonist on basis of a false belief that he will receive an undesired snack, when in fact he will receive a nice snack. Children's scores ranged between 0 and 2 for the emotion attributions.

All emotion components assessed equal number of positive and negative emotion scenarios. Initial analysis showed that one story of component VII (story 4) was uncorrelated with all other tasks and it was thus omitted from further analyses. Children thus received a possible EU score between 0 and 11. Cronbach's alpha for the 11 emotion understanding items was acceptable,  $\alpha = .60$ , despite the wide range of constructs assessed.

(iii) *Empathic role-taking*. At the conclusion of the Emotion Elicitation Paradigm (outlined in Chapter 4) children were interviewed regarding their affective responses and perspective taking abilities to the vignettes using the Empathy Continuum protocol (Strayer & Roberts, 2004b). Four vignettes from the emotion elicitation paradigm were chosen because of their negative emotional narrative and comprised the first day (vignette 3), peer argument (vignette 5), social exclusion (vignette 7) and fear (vignette 8) vignettes, and children were questioned on their responses to these vignettes. It was not possible to interview children about all vignettes as this would have been long and repetitive. Following a memory prompt, children were asked how they felt while watching the vignette, and to justify their emotional response. If children were unable to answer or gave an unclear response, they were prompted and asked, “did you feel happy, sad, angry or scared?”. Children were then asked to nominate an emotional response for the protagonist of the story. Children who did not nominate feeling an emotion after prompting were still required to nominate an emotion for the protagonist. All children were able to nominate emotions for all story protagonists.

For each vignette, empathic role-taking scores were calculated on the basis of (i) the match between children’s self nominated emotion and that of the protagonist, and (ii) the degree of sophistication for their emotion justification (Strayer, 1993). Empathic role-taking was rated on a 20-point scale. Empathic responses were those in which children reported feeling the same or similar as the protagonist, coupled with a justification revealing an ability to take the protagonists’ point-of-view as justification for their self-nominated emotion. Scores from the four vignettes were then combined to create a total empathic role-taking score, which had good internal consistency,  $\alpha = .71$  (see Appendix C for interview protocol and scoring instructions).

### ***Social adaptation***

(i) *Social skills, social maturity and problem behaviours.* Measures of teacher rated social skills, social maturity and problem behaviours are those presented in Chapter 4 (Section 4.2.3).

(ii) *Social preference.* Social preference was assessed using the sociometric interview technique developed by Coie, Dodge and Coppotelli (1982). This widely used interview provides information on children's relative social standing in their peer environment. Over 50% of each classroom participated in the sociometric nominations to ensure an accurate assessment of children's peer acceptance (Cairns et al., 1990, cited in Schultz, Izard, & Bear, 2004). Each child was interviewed individually. Using photographs, children were asked to nominate three children in their class that, "they like to play with the most" and three children, "they do not like to play with". Cross-gender nominations were permitted (Graziano, et al., 2007; Terry & Coie, 1991). To account for the differing numbers of children in each classroom, 'like most' and 'like least' scores were standardised. Children's standardised 'like least' total was subtracted from their standardised 'like most' total to calculate each child's social preference in their classroom (Coie, et al., 1982).

### **6.2.3 Procedure**

Children were tested individually in a quiet room at their school over two sessions in kindergarten approximately 11.5 weeks apart ( $SD = 6.25$  weeks). Two experimenters tested each child at each session. During the first session, children completed emotion understanding (EU) and affective labelling tasks, and an assessment of verbal ability. In the second session, children completed the theory-of-mind (ToM) tasks, sociometric interview (to calculate social preference), and viewed the emotionally evocative vignettes. To maintain engagement and enthusiasm for the assessments, children were offered small rewards (i.e., stickers) at the completion of each task. The order of the individual task presentations during each session was counterbalanced, with children randomly assigned to one of two task orders. Furthermore, within task items were counterbalanced in one of two orders for the EU and ToM tasks, and children were also randomly assigned to one within-task item order. The majority of children completed all the tasks involved in

the study, although, due to absence from school and scheduled school activities, there were some children who did not complete every session, or every task within a session. Teachers completed all questionnaires after the second testing session.

### **6.3 Results**

First, bivariate relations among measures of emotional competence and social adaptation are examined. Second, to examine the unique contribution of emotion regulation, expressions of affect and understanding of mind and emotion to the prediction of children's social adaptation a series of hierarchical multiple regressions were constructed. In addition to exploring the independent influence of different domains of emotional competence on social adaptation, interactive effects were also examined. Finally, the differential impact of ToM and EU on children's social adaptation will also be assessed. Descriptive statistics for all tasks and measures are shown in Table 6.1. Previous research has shown that age, sex and verbal ability are related to emotional competence and social adaptation, as such, these variables are included as controls where appropriate.

Table 6.1  
Descriptive Statistics for Study Variables

| Measure                                   | <i>n</i> | <i>M</i> | <i>SD</i> | Range        |
|---|----------|----------|-----------|--------------|
| Age (months)                              | 114      | 67.36    | 5.02      | 55 – 77      |
| Verbal ability                            | 113      | 60.46    | 5.16      | 44 – 70      |
| Understanding mind and emotion            |          |          |           |              |
| Theory of mind                            | 113      | 4.23     | 1.87      | 0 – 6        |
| Emotion understanding                     | 112      | 6.04     | 2.21      | 1 – 11       |
| Empathic role-taking                      | 112      | 18.66    | 13.91     | 0 – 63       |
| Emotion regulation                        |          |          |           |              |
| Disengagement (%)                         | 113      | 20.19    | 18.64     | 0 – 83.16    |
| Teacher-rated social adaptation           |          |          |           |              |
| Social skills – SSRS                      | 111      | 42.04    | 12.13     | 14 – 60      |
| Social maturity                           | 111      | 29.32    | 9.01      | 8 – 49       |
| Problem behaviours - SSRS                 | 111      | 10.74    | 7.34      | 0 – 35       |
| Peer-rated social preference <sup>a</sup> | 114      | .00      | 1.67      | -4.55 – 4.33 |

<sup>a</sup> Social preference is a standardised score

### 6.3.1 Data consolidation

Children’s ToM and EU were significantly correlated (see Table 6.2). As noted earlier, ToM and EU can be treated as components of children PPT, or they may be examined separately (de Rosnay & Hughes, 2006; Ruffman, et al., 2002). Examining the partial correlation between ToM and EU, controlling for verbal ability, EU and ToM remained significantly correlated,  $r_p = .35$ ,  $p < 0.01$ . Further, Table 6.2 shows that ToM and EU display similar relations to social competence variables. Therefore, a PPT score was calculated by summing the standardised total scores of ToM and EU; which was re-standardised to produce an overall PPT z-score. However, in addition to an examination of the influence the child’s overall PPT on their social adaptation, the independent influence of ToM and EU will also be examined.

Teacher-rated social skills and social maturity were robustly positively related,  $r(111) = .76$ ,  $p < 0.01$ , and internally consistent,  $\alpha = .84$ , despite comprising

distinct items. As such, standardised totals for each were summed and this total score was standardised to produce an overall teacher-rated *social competence z*-score.

### 6.3.2 Bivariate relations

Table 6.2 summarises the pattern of bivariate relations between background variables (sex, age and verbal ability), emotional competence variables (ToM, EU, empathic role-taking and disengagement) and children's social adaptation (teacher rated social competence and problem behaviours, and peer-rated social preference). Descriptive statistics for these variables by affective empathy group are presented in Table 6.3. The main findings are summarised below.

Various features of Tables 6.2 and 6.3 are noteworthy. First, sex is unrelated to all of the study variables. Second, despite the fact that age and verbal ability showed similar patterns of relations, it is clear from Table 6.2 that verbal ability is more robustly related to children's understanding of mind and emotion than age, as has been previously shown (e.g., Cassidy, et al., 2003). Also, higher levels of verbal ability were significantly associated with lower levels of disengagement and higher levels of social competence. Therefore, in subsequent analyses, it is assumed that verbal ability is a more informative developmental variable than chronological age when considering individual differences in emotional competence and social adaptation.

Inspection of Table 6.2 shows that there were no significant bivariate relations across different domains of emotional competence (i.e., disengagement understanding of mind and emotion, and empathic role-taking). Although somewhat surprising, these variables have not been simultaneously examined previously at this age. Further, there were no differences between affect groups with respect to any measure of understanding of mind and emotion (see Table 6.3). The relation between children's disengagement and affect categorisation has been examined in Chapter 4, revealing a significant interaction between disengagement as a function of sex and affect group, with boys who use high levels of disengagement likely to be inexpressive, while girls displaying high levels of disengagement more likely to express worry-concern (see Section 4.3.5).

Despite the robust negative association between teacher rated social competence and problem behaviours, the different domains of emotional competence and verbal ability showed very distinct patterns of association with the two teacher rated measures. All emotional competence variables were associated with social competence in predictable ways. Thus, higher levels of PPT and empathic role-taking, and lower levels of disengagement, were associated with higher levels of social competence (see Table 6.2). Similarly, children expressing sad affect had higher levels of social competence compared to children expressing worry-concern ( $p < 0.05$ , Table 6.3). By contrast, relations with problem behaviours were modest and more specific. Only children with lower levels of ToM and high levels of disengagement were likely to be rated by their teachers as having problem behaviours, although these relations were modest (Table 6.2). There was also a marginal relation between affect group and problem behaviours,  $F(2, 101) = 2.82, p = 0.06$ ; contrasts indicated that children expressing sad affect had significantly lower levels of problem behaviours compared to children expressing worry-concern,  $p < 0.05$ . Finally, although children's teacher rated social competence and peer rated social preference were robustly correlated, peer rated social preference showed a more specific pattern of relations with the emotional competence variables. Social preference was significantly positively related to ToM and negatively related to disengagement. Unlike teacher rated social competence, however, there was no relation between social preference and verbal ability, emotion understanding or empathic role-taking. Finally, there was no difference in social preference as a function of children's affect group.

In the following regression analyses, the simultaneous contribution of multiple domains of emotional competence to children's teacher-rated social competence and problem behaviours is examined.

Table 6.2  
Summary of bivariate correlations between background, emotional competence and social adaptation variables

|                         | 1 | 2   | 3     | 4     | 5     | 6     | 7    | 8     | 9      | 10     | 11     |
|-------------------------|---|-----|-------|-------|-------|-------|------|-------|--------|--------|--------|
| 1. Sex                  | – | .08 | .15   | .15   | -.07  | .04   | .16  | -.15  | .18    | -.13   | .16    |
| 2. Age                  |   | –   | .25** | .14   | .35** | .29** | .07  | .02   | .09    | .06    | .03    |
| 3. Verbal ability       |   |     | –     | .52** | .45** | .56** | .11  | -.21* | .30**  | -.02   | .17    |
| 4. ToM                  |   |     |       | –     | .50** | –     | .00  | -.19  | .40**  | -.19*  | .35**  |
| 5. EU                   |   |     |       |       | –     | –     | -.04 | -.03  | .28**  | -.07   | .18    |
| 6. PPT (EU + ToM)       |   |     |       |       |       | –     | -.01 | -.10  | .39**  | -.15   | .30**  |
| 7. Empathic role-taking |   |     |       |       |       |       | –    | -.13  | .22*   | -.07   | .13    |
| 8. Disengagement        |   |     |       |       |       |       |      | –     | -.36** | .21*   | -.41** |
| 9. Social competence    |   |     |       |       |       |       |      |       | –      | -.75** | .57**  |
| 10. Problem behaviours  |   |     |       |       |       |       |      |       |        | –      | -.51** |
| 11. Social preference   |   |     |       |       |       |       |      |       |        |        | –      |

\*  $p < 0.05$ , \*\*  $p < 0.01$ . Note: ToM = Theory of mind, EU = Emotion understanding, PPT = Psychological perspective taking

Table 6.3  
Means (standard deviations in parentheses) of study variables by affect group, ANOVA *F* value and significant contrasts using children expressing sadness as the reference category

|                      | <i>n</i> | Affect Group                     |                                    |                         | F-value | Contrasts |
|----------------------|----------|----------------------------------|------------------------------------|-------------------------|---------|-----------|
|                      |          | Inexpressive<br>( <i>n</i> = 45) | Worry-Concern<br>( <i>n</i> = 34 ) | Sad<br>( <i>n</i> = 34) |         |           |
| Age                  | 113      | 67.56<br>(5.01)                  | 67.88<br>(5.38)                    | 66.56<br>(4.78)         | .64     | –         |
| Verbal ability       | 112      | 60.18<br>(5.20)                  | 59.56<br>(5.89)                    | 61.62<br>(4.24)         | 1.40    | –         |
| PPT                  | 111      | -.05<br>(1.00)                   | -.14<br>(.87)                      | .22<br>(1.00)           | 1.23    | –         |
| Empathic role-taking | 112      | 19.07<br>(14.05)                 | 21.50<br>(16.16)                   | 15.32<br>(10.59)        | 1.73    | –         |
| Disengagement        | 113      | 21.97<br>(22.54)                 | 23.49<br>(17.09)                   | 14.52<br>(12.66)        | 2.37†   | S < W*    |
| Social competence    | 110      | -.02<br>(.90)                    | -.29<br>(1.07)                     | .32<br>(1.01)           | 3.12*   | S > W*    |
| Problem behaviours   | 110      | 10.57<br>(6.78)                  | 13.03<br>(8.49)                    | 8.90<br>(6.36)          | 2.73†   | S < W*    |
| Social preference    | 113      | .11<br>(1.48)                    | -.25<br>(1.86)                     | .15<br>(1.76)           | .60     | –         |

†  $p < 0.1$ , \*  $p < 0.05$ . Note: I = Inexpressive, W = Worry-concern, S = Sadness, PPT = Psychological perspective taking; PPT and social preference reflect standardised scores.

### 6.3.3 Emotional competence, social competence and problem behaviours

To examine the unique contribution of emotional competence variables to the prediction of social competence and problem behaviours, a series of hierarchical multiple regressions were constructed (see Table 6.4). In addition, the interaction between children's emotion experience and understanding of mind and emotion was examined, as well as the differential influence of ToM and EU. Although sex was unrelated to emotional competence and social adaptation variables, it was controlled for in the regression models because of sex-related differences reported in previous research (e.g., Denham, et al., 2003; Eisenberg & Fabes, 1990).

In the first model, predicting teacher rated social competence, verbal ability and sex were entered on the first step. PPT, empathic role-taking, disengagement and affect group were entered on the second step (see Table 6.4). Affect group was

dummy-coded with children expressing sadness as the reference category. At the first step, the model was significant,  $F(2, 105) = 6.78, p < 0.01$ , and verbal ability made an independent contribution to children's social competence. At the second step, the overall model was significant,  $F(7, 100) = 6.90, p < 0.01$ . PPT, empathic role-taking, disengagement and affect group all made significant independent contributions to the prediction of social competence controlling for language ability and sex, but language ability was no longer a significant predictor. With respect to affect group, children expressing sadness had greater social competence than children expressing worry-concern. There was no difference between sad and inexpressive affect groups.

Table 6.4  
Hierarchical multiple regression analyses predicting teacher rated social competence and problem behaviours ( $N = 108$ )

| Variable              | Model 1           |         | Model 2            |         |
|-----------------------|-------------------|---------|--------------------|---------|
|                       | Social Competence |         | Problem Behaviours |         |
|                       | $\Delta R^2$      | $\beta$ | $\Delta R^2$       | $\beta$ |
| Step 1                | .11*              |         | .01                |         |
| Sex                   |                   | .15     |                    | -.11    |
| Verbal ability        |                   | .28**   |                    | .00     |
| Step 2                | .21**             |         | .12*               |         |
| Sex                   |                   | .12     |                    | -.11    |
| Verbal ability        |                   | .01     |                    | .17     |
| PPT                   |                   | .29**   |                    | -.15    |
| Empathic role-taking  |                   | .21*    |                    | -.08    |
| Disengagement         |                   | -.25**  |                    | .19†    |
| Affect: Inexpressive  |                   | -.10    |                    | .06     |
| Affect: Worry-concern |                   | -.23*   |                    | .26*    |
| Total $R^2$           | .33**             |         | .14*               |         |

†  $p < 0.1$ . \*  $p < 0.05$ . \*\*  $p < 0.01$ . Note: PPT = Psychological perspective taking

To assess the combined influence of disengagement and understanding of mind and emotion, two interaction terms were computed using standardised scores (disengagement x PPT and disengagement x empathic role-taking), and examined

individually in a third step of the model predicting children's social competence. Both interaction terms were non-significant.

To assess whether ToM and EU had a similar influence on teacher-rated social competence, the overall (2-step) model was rerun with either ToM or EU included in place of the composite PPT variable. Both models remained essentially unchanged, with ToM,  $\beta = .26$ ,  $t(100) = 2.68$ ,  $p < 0.01$  and EU,  $\beta = .20$ ,  $t(100) = 2.05$ ,  $p < 0.05$ , having very similar impacts on the prediction of teacher-rated social competence.

In the second model, predicting teacher rated problem behaviours, the same overall approach was taken (see Table 6.4). At the first step, verbal ability and sex, made no significant contribution to problem behaviours,  $F(2, 105) = .64$ , *ns*. At the second step, the overall model was significant,  $F(7, 100) = 2.25$ ,  $p < 0.05$ . Only affect group was a significant predictor of problem behaviours, such that children expressing worry-concern had greater levels of problem behaviours than children expressing sadness. Disengagement was a marginally significant predictor of problem behaviours. To assess the combined influence of disengagement and understanding of mind and emotion, two interaction terms were again computed using standardised scores (disengagement x PPT and disengagement x empathic-role taking) and examined individually in a third step of the model predicting children's problem behaviour. The interaction between PPT and disengagement was significant,  $\beta = -.23$ ,  $t(99) = 2.46$ ,  $p < 0.05$ ; children who disengaged more than average, regardless of their perspective taking skills, had the highest levels of problem behaviours, while children who disengaged less than average were less likely to experience problem behaviours if they also had greater PPT skills. The addition of the interaction term improved the overall model,  $\Delta R^2 = .05$ ,  $\Delta F(1, 99) = 6.04$ ,  $p < 0.05$ . In the final model, including the interaction term, affect group,  $\beta_{\text{worry-concern}} = .24$ ,  $t(99) = 2.15$ ,  $p < 0.05$ , and disengagement,  $\beta = .23$ ,  $t(99) = 2.34$ ,  $p < 0.05$ , were significant predictors of problem behaviours. Figure 6.1 depicts the interaction relationship.

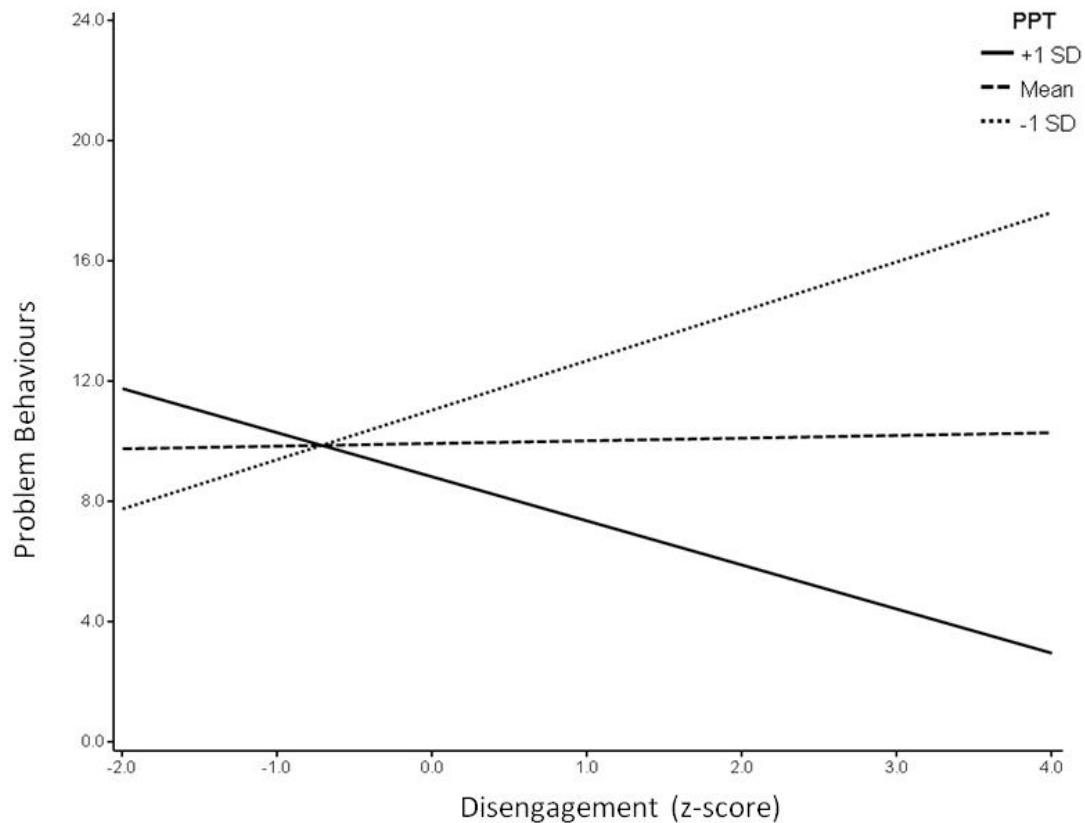


Figure 6.1. Interaction between perspective taking ability and disengagement on problem behaviours

To assess whether ToM and EU had a similar influence on teacher-rated problem behaviours, the overall (2-step) model was rerun with either ToM or EU included in place of the composite PPT variable. Both models remained essentially unchanged, neither ToM,  $\beta = -.17$ ,  $t(100) = -1.52$ , *ns*, nor EU,  $\beta = -.07$ ,  $t(100) = -.61$ , *ns*, had a significant impact on the prediction of teacher rated problem behaviours.

#### 6.3.4 Emotional competence and social preference

The simultaneous impact of children's emotional competence on social preference was examined using hierarchical regression. As affect group and empathic role-taking were unrelated to social preference, these variables were not included in the subsequent models. Thus, Model 3 was constructed to examine the impact of PPT and disengagement on social preference, controlling for verbal ability and sex (see Table 6.5). At the first step, the model was not significant,  $F(3, 108) = 2.90$ , *ns*. At the second step, however, the overall model was significant,  $F(4, 106) =$

9.32,  $p < 0.001$ . Both PPT and disengagement made an independent significant contribution to the prediction of social preference.

To assess the contribution of ToM and EU to social preference, Model 3 was rerun with either ToM or EU included in place of the composite PPT variable. When ToM was included the overall model remained essentially unchanged,  $F(4, 107) = 8.89$ , and ToM was a significant predictor of children's social preference,  $\beta = .31$ ,  $t(107) = 3.14$ ,  $p < 0.01$ . However, when EU was included, the overall model remained significant,  $F(4, 106) = 7.31$ ,  $p < 0.01$ , but EU was not a significant predictor of social preference,  $\beta = .18$ ,  $t(107) = 1.85$ , *ns*, suggesting that ToM is of disproportionate importance for social preference at 5 years of age.

Given the robust relation between social competence and social preference, a further hierarchical regression model was constructed including teacher rated social competence as a predictor of social preference (see Table 6.5). This conservative approach was adopted to examine whether the significant relations between children's emotional competence variables and social preference remained once concurrent social competence was controlled for. In this fourth model, sex, verbal ability and teacher rated social competence were included at the first step, ToM was included on the second step in place of the composite PPT variable, in addition to disengagement. The first step of Model 4 was significant,  $F(3, 105) = 16.59$ ,  $p < 0.01$ , with teacher rated social competence making a significant contribution to the prediction of children's peer-rated social preference. The second step of model 4 was also significant,  $F(5, 103) = 13.85$ ,  $p < 0.01$ . In addition to teacher rated social competence, ToM and disengagement also made significant independent contributions to the prediction of peer rated social preference.

Finally, to assess the combined influence of disengagement and ToM, an interaction term was computed using standardised scores (disengagement x ToM) and examined on the third step of the model predicting children's social preference controlling for their teacher-rated social maturity. The interaction term was non-significant, and did not improve the overall model.

Table 6.5  
Hierarchical multiple regression analyses predicting peer-rated social preference ( $N = 112$ )

| Variable          | Model 3      |         | Model 4      |         |
|-------------------|--------------|---------|--------------|---------|
|                   | $\Delta R^2$ | $\beta$ | $\Delta R^2$ | $\beta$ |
| Step 1            | .05          |         | .32**        |         |
| Sex               |              | .15     |              | .06     |
| Verbal ability    |              | .15     |              | .00     |
| Social competence |              | –       |              | .55**   |
| Step 2            | .21**        |         | .08**        |         |
| Sex               |              | .12     |              | .04     |
| Verbal ability    |              | -.10    |              | -.12    |
| Social competence |              | –       |              | .42**   |
| PPT               |              | .32**   |              | –       |
| ToM               |              | –       |              | .20*    |
| Disengagement     |              | -.39**  |              | -.26**  |
| Total $R^2$       | .26**        |         | .40**        |         |

\*  $p < 0.05$ ., \*\* $p < 0.01$ . Note: ToM = Theory of mind, PPT = Psychological perspective taking

## 6.4 Discussion

This study makes an important contribution to a wide-ranging literature on children's emotional competence in early childhood. Somewhat surprisingly, there was remarkable independence between domains and components of children's emotional competence. Thus, by and large, these findings offer some validation of the disparate literatures examining separate relations between these different features of emotional competence. That being so, the current study also offered some clarification of the relations between components of children's emotion experience and understanding of mind and emotion, and the importance of these domains of emotional competence for social adaptation. This chapter also examined the independent and combined influence of emotion regulation and understanding of mind and emotion on children's social adaptation.

When considered simultaneously, children's disengagement and affective responses to emotionally challenging events, in addition to their understanding of

mind and emotion, made independent contributions to social competence. Furthermore, disengagement and ToM also made independent contributions to the prediction of children's peer rated social preference. As expected, only children's experience of emotion was directly related to teacher rated problem behaviours. Finally, both children's disengagement and ToM made an independent contribution to children's peer rated social preference. The simultaneous, independent contribution of all domains of emotional competence to children's social competence was somewhat unexpected. Nonetheless, this finding is in line with the existing literature which has explored emotional competence constructs as distinct domains, each of which independently has been shown to influence social competence (e.g., Denham, et al., 2003; Saarni, 1999). The current findings extend the extant literature by demonstrating that these domains of emotional competence uniquely predict social adaptation (as rated by teachers) when examined contemporaneously.

As expected from the findings described in Chapter 3 and already partially shown in Chapter 4, children who disengaged from the emotionally evocative vignettes least had higher levels of social competence and fewer problem behaviours as rated by teachers, and were more socially accepted by their peers. In fact, of all components of emotional competence employed in the current study, the degree to which children disengaged from emotional stimuli was most consistently related to social outcomes, a finding that highlights the intimate link between adaptive emotion regulation and socially competent behaviours. Children's affective responses to an empathy eliciting event were also independently related to teacher-rated social competence and problem behaviours. As expected from the findings already partially shown in Chapter 4, children expressing empathic sadness were more socially competent and had fewer problem behaviours compared to their peers expressing worry-concern. Notably, the influence of disengagement and affective responding on children's social adaptation remained even when children's understanding of mind and emotion was simultaneously examined. This finding suggests that these aspects of children's emotional experience play an independent role in predicting concurrent individual differences in children's social adaptation.

The current chapter also examined the relation between children's understanding of mind and emotion and social adaptation. It was found that children's ToM and EU, both separately and together as an index of PPT, as well as empathic role taking, made a direct, independent contribution to children's social competence as assessed by teachers.

Psychological perspective taking, comprising both ToM and EU, was broadly related to teacher rated social competence as expected, and when examined independently, both ToM and EU showed a remarkably similar relation to teacher rated social competence. This has not always been found, with past research suggesting that ToM and EU are differentially related to social competence (e.g., Weimer & Guajardo, 2005), while others have found only a modest relation between ToM and social competence once verbal abilities were controlled (e.g., Cassidy, et al., 2003). In the current study, verbal abilities did not play a role in predicting social adaptation once PPT was examined. The age of the children may help explain the current findings. The children in this study were older than those in the Cassidy et al. (2003) and Weimer et al. (2005) studies, and there is evidence for a more specific link between perspective taking and social competence in children around the time of school entry (de Rosnay, et al., 2008; Izard, et al., 2001; Mostow, Izard, Fine, & Trentacosta, 2002).

As expected, children's empathic role-taking was associated with social adaptation, such that children with a greater inclination toward empathic role-taking were rated as more socially competent. This finding supports and clarifies previous findings linking empathic role-taking (as an index of children's broader empathy) to social competence (e.g., Eisenberg, Fabes, Murphy, et al., 1996; Miller, et al., 1996; Roberts & Strayer, 1996). However, the current study found no relation between empathic role taking and other measures of children's understanding of mind and emotion, as has sometimes been documented in the literature (Carlo, et al., 1991; Denham & Couchoud, 1991; Findlay, Girardi, & Coplan, 2006; Roberts & Strayer, 1996; Zahn-Waxler, et al., 1992). From a broad developmental perspective, the relation between children's PPT and empathy makes good sense because the profound changes occurring in children's psychological understanding puts them in a

better position to understand other people's predicaments. Nevertheless, as outlined in Chapter 1, while empathic responses require children to take the perspective of others (Eisenberg, 2000b; Hoffman, 1982), having the perspective-taking skills required for empathic responding does not alone imply that children will respond to the distress of others in an empathic manner (Eisenberg & Mussen, 1989). Thus, children old enough to possess the necessary psychological capacities may respond to the distress of others in a more diverse manner (e.g., with personal distress or by being unresponsive, Eisenberg, 2000b). The empathic role-taking measure employed in the current study requires children not only to demonstrate an ability to take the perspective of another, but also to report feeling an emotional response themselves. That is, empathic role-taking as measured in the current study assesses children's proclivity to take the emotional response of another in distress. The current findings suggest that children's proclivity towards empathic responding is independent from other measures of children's understanding of mind and emotion when considered an individual differences construct.

There was no relation between children's empathic role taking and their affective empathy suggesting that these distinct measures of empathy are tapping different skills and proclivities. As outlined in Chapter 2, only modest relations have been found between children's observed affective responses to emotional events and their self-reported affective response (e.g., Durbin, 2010; Strayer & Roberts, 1997), suggesting that children are often inaccurate in their self-reported emotional experience and, as such, would not be expected to be associated with observed facial affect.

In addition to examining the simultaneous influence of different components of emotional competence on children's social adaptation, the current study was uniquely placed to examine the combined influence of different domains of emotional competence. As expected, children's disengagement and PPT had an interactive influence on the experience of problem behaviours, suggesting that the relation between children's responses to emotionally challenging events and their (maladaptive) social behaviours is moderated by their ability to take the perspective of others. Poor PPT magnified the negative association between poor emotion

regulation and problem behaviours. Prior research supports the finding that antisocial and maladaptive behaviours are closely associated with poor emotion regulation rather than a deficit in children's understanding of mind and emotion *per se* (e.g., Hughes, White, Sharp, & Dunn, 2000). The current findings suggest that this relation is more complex; PPT ability appears to play an interactive role with emotion regulation to predict poor social outcomes in typical children.

Finally, to better understand the direct relation between children's emotional competence and their social status, teacher rated social competence was controlled for. There have been several studies examining the contribution of social skills to social status (e.g., Denham & Holt, 1993; Ladd, et al., 1988), however, few have examined the impact of children's emotional competence over and above the robust relation between children's social competence and their peer rated social status. In the current study, as expected, teacher rated social competence was a robust predictor of social preference. However, over and above this relation, disengagement and ToM were also significant predictors of social preference. This finding strongly suggests that certain features of children's emotional competence are important for establishing peer acceptance during the year in which children transition to school.

Despite the consistent relations between ToM, EU and teacher ratings of social competence, it was ToM, not EU, which emerged as important for successful peer relationships at five years of age over and above children's concurrent social competence (see Slaughter, et al., 2002). ToM is a construct encompassing children's broad mental state understanding, whereas, EU taps more situation-specific knowledge of emotion, its eliciting contexts and its psychological influence (de Rosnay, et al., 2008). The current findings suggest that ToM plays a crucial role in peer acceptance. Conversely, EU influences social preference indirectly via an association with children's general social competencies.

There are a number of limitations of the current study. First, children's capacity to accurately label affective expressions was not given consideration as an independent aspect of understanding of mind and emotion. The understanding of mind and emotion measures employed in the current study involved children

anticipating or predicting emotional outcomes that were not currently observable. It is plausible that the child's capacity to discern and attach appropriate labels to affective expressions may capture a distinct component of emotional competence (e.g., Schultz, et al., 2001). In particular, children's abilities to accurately label affective expressions may play an important role in determining their behavioural and affective responses to challenging emotional events. Those children who are poor at understanding the emotional expression of others may not immediately understand the emotional salience of challenging events, and this may be reflected in a distinct pattern of behavioural and affective responses.

A second limitation of the current study was that although children's social adaptation was rated by both teachers and peers, there was no measure of children's *observed* social interactions with their peers. Plausibly, the manner in which children conduct themselves in interpersonal situations may be highly reflective of their abilities to both manage their emotional experience, as well as their understanding of mind and emotion. The measures used in the current study are an indirect means by which to understand children's efficacy in social interactions. Nevertheless, children's peer rated social preference has been found to be robustly related to their social conduct in interpersonal situations (e.g., Cillessen & Mayeux, 2004; Coie & Dodge, 1988), suggesting that they are appropriate measures of social behaviour.

Finally, the analyses presented in the current chapter focus exclusively on the concurrent association between different domains of children's emotional competence and their social adaptation. This approach is, thus, unable to discern the longitudinal impact of children's behavioural and affective responses to challenging events on their later social competencies. As such, the enduring influence of emotion regulation and empathy on children's developing social adaptation over time is unclear. In order to remedy this limitation, the following chapters of this thesis explore the longitudinal impact of children's behavioural and affective responses on social adaptation. In the following chapter, disengagement and affective empathy are modelled to examine their stability and consistency across a 12 months period. In Chapter 8, the longitudinal relation between children's

disengagement and social adaptation is explored. The findings of the current chapter highlight the important role played by children's emotion regulation and understanding of mind and emotion in their developing social competencies.

Chapter 9 extends the findings presented in the current chapter by examining the simultaneous longitudinal influence of disengagement, expressions of affect and understanding of mind and emotion on children's social adaptation on year later.

## Chapter Seven

### Longitudinal Stability in Emotion Regulation and Empathy

#### 7.1 Introduction and aims

In Chapters 4 and 6 it was shown that children's disengagement and expressions of affect during emotionally challenging vignettes were meaningfully related to their concurrent social adaptation in Kindergarten. In particular, the findings presented in Chapter 6 demonstrate that even when considered simultaneously with children's emotion understanding, behavioural responses make an independent contribution to social adaptation. Prior to an examination of the longitudinal relation between behavioural responses and social adaptation (in Chapter 8), the current chapter examines the consistency and longitudinal stability of these behaviours. The findings presented in Chapter 4 suggest that individual differences children's disengagement are highly consistent across different emotional vignettes. As such, the longitudinal stability of disengagement will be examined using confirmatory factor analysis (CFA), which will also allow an investigation of the factor structure of disengagement across the four vignettes of interest. However, given the relatively poor internal consistency of affective responses presented in Chapter 4, especially for sadness, a more cautious approach is taken to examine the longitudinal stability in worry-concern and sadness. The first aim of the current chapter is to establish the longitudinal stability of disengagement and expressions of affect from Kindergarten to Year 1. Second, due to the close conceptual relation between emotion regulation and empathy proposed by Eisenberg and Fabes (1992) and outlined in Chapter 1, the current chapter aims to examine the relation between disengagement and affect at both time-points.

Chapter 4 showed that disengagement was a highly consistent behavioural response across eight different vignettes, seven of which had emotional themes. Reasonable stability was also observed across the four vignettes of primary theoretical interest (vignettes 1, 3, 7 and 8), despite considerable variation in the occurrence of disengagement in these vignettes. Furthermore, disengagement was observed in a large proportion of children. These features make disengagement a

suitable candidate for CFA, which will allow the consistency of this response across the four vignettes at both time-points to be examined, in addition to longitudinal stability across time-points. Over and above internal consistency, a CFA model allows mean level of change across time to be examined, so it is possible to examine how disengagement is changing with age. Using a confirmatory factor analysis to examine coherence across measures of a construct and stability in a construct over time has certain advantages over traditional correlational measures. Correlations among measures and across time-points may be influenced by a broad range of factors, such as shared method variance, repeated use of the same task, and the use of the same informer for multiple methods. A CFA instead investigates the possibility of a common mechanism underlying performance on a series of tasks which are hypothesised to be meaningfully related to the construct in question (Brown, 2006). Indeed, CFAs have successfully been applied to an exploration of the factor structure of other regulatory constructs (e.g., Hughes & Ensor, 2011; Sulik et al., 2010). For example, Sulik et al. (2010) conducted a CFA on measures of effortful control and found that diverse measures of effortful control all significantly loaded onto a single latent factor. Furthermore, Hughes and Ensor (2011; Hughes, Ensor, Wilson, & Graham, 2010) successfully modelled the longitudinal stability of children's executive functioning from four to six years of age using CFA (see also Murray & Kochanska, 2002).

Several features of the worry-concern and sadness data, however, make it unsuitable for CFA. First, there were a priori theoretical and empirical reasons to expect that worry-concern and sadness would not conform to this type of modelling, with these expressions specific to their eliciting context: different affective responses are theorised to correspond to distinctive, individualised response patterns (Ekman, 2004, see Chapter 1), and previous research suggests that children can be reliably categorised based on affect (Cole, et al., 1996). Second, only a small proportion of children were observed to express affect across the different vignettes. Sadness, in particular, showed a highly context specific pattern of responding, such that there was very little sadness (observed in less than 12% of children) in those vignettes not designed to elicit empathy. As a result, the worry-

concern and sadness data are both strongly positively skewed. To successfully model consistency and stability using CFA it is necessary to approximate normal distribution (Brown, 2006). Finally, the findings of Chapter 4 suggest that the internal consistency for sadness was relatively poor compared to the other behavioural measures; a finding entirely consistent with the situational specificity in which sadness is observed. In keeping with this overall picture, in Chapter 4 it was shown that children's affective responses to vignette 3 specifically were associated with their social adaptation (see Table 4.7), and in Chapter 5 it was shown that there was a specific relation between sadness elicited in an empathy situation (vignette 3) and physiological responses indicative of emotion regulation. Given these issues, traditional correlational methods are used to analyse the consistency of affective responding across different vignettes. In order to examine the stability and concurrent relations between expressions of worry-concern and sadness a path analysis was constructed focusing exclusively on these expressions in vignette 3.

As outlined in Chapters 3 and 4, while children's behavioural responses to emotional events has been examined in some detail in the literature (e.g., Cole, et al., 1996; Gilliom, et al., 2002; Grolnick, et al., 1996), these responses are typically either summed across multiple vignettes of differing emotional valences (e.g., Cole, et al., 1996), or assessed in only one emotional context (e.g., Eisenberg & Fabes, 1995; Gilliom, et al., 2002). The consistency and stability of school-aged children's responses to emotional events has yet to be determined. The extant literature has instead predominantly focused on the relation between behavioural responses in given emotional (and non-emotional) contexts, and children's socio-emotional functioning (e.g., Cole, et al., 1996; Eisenberg & Fabes, 1995). Although this approach has obvious merits, it is important to first examine the structure, stability and developmental change associated with these behaviours. For example, if children's responses are inconsistent across different emotional events then the validity of aggregating these responses across contexts is questionable.

As noted in Chapter 4, there are relatively few studies, examining the coherence of children's behavioural responses to different emotional events. Furthermore, those studies that have examined such coherence across difference

emotional contexts have had mixed findings; some results have suggested that children's behavioural and affective responses to emotional events are not consistent across contexts (e.g., Eisenberg, McCreath, et al., 1988; Grolnick, et al., 1996), while others have provided contradictory evidence (e.g., Miller, et al., 1996). The findings of Chapter 4 shed some light on this issue, and suggest that children's behavioural responses are, on the whole, consistent across different emotionally evocative events. However, as expected, children's expressions of sadness were not stable across different vignettes. Nevertheless, one might still expect that sad responding might be stable within the same context over time.

Indeed, it is important to establish the stability of children's behavioural responses across time more generally. If children's behavioural responses to challenging events are not stable across time, the relevance of specific behavioural responses for social outcomes, for example, becomes less plausible. However, there is very little research addressing this issue. An exception is a study by Hastings and colleagues (2000) examining children's concern for others during distress simulations at both five and seven years of age. Concern was assessed using a global measure including expressions of concern, helping behaviours and sustained attention toward a distressed victim who simulated a physical injury. Examining children's responses across contexts, they found that at both ages there was no mean difference in children's concern toward an experimenter or toward their mother, thus providing some evidence for cross-context consistency in concern responses. As there was cross-situational consistency at both ages, Hastings et al. created an aggregate score in order to examine longitudinal stability. They found a positive correlation in expressions of concern from five to seven years of age, suggesting that children's concern in response to emotional events is moderately stable and, furthermore, expressions of concern were positively related to social competencies. Based on the work of Hastings et al. and the theoretical construal of emotion regulation processes (Thompson, 1994) it is expected that individual differences in children's responses to the same emotional events will be relatively stable over time.

In addition to the stability of behavioural responses, the current chapter is also concerned with developmental change in responding across time. In particular,

using a CFA to model children's disengagement allows an exploration of developmental change in this response. As children get older, it is widely accepted that they rely on more sophisticated emotion regulation strategies (Kopp, 1989). It is expected, therefore, that at six years of age children will be more adept at managing their emotional responses compared to one year earlier. Hastings et al. (2000), in their longitudinal study examining expressions of concern from five to seven years of age, found an overall decrease in the amount of concern expressed. As such, it is expected that there will be a decrease in worry-concern and sadness expressed in the same context as children mature. Furthermore, it is hypothesised that, although disengagement is used as a possible strategy to manage emotional responses across the life-span, there would be less of a reliance on this strategy at Time 2 compared to Time 1 because children, experiencing less arousal with maturity, will not need to employ regulatory behaviours to the same extent.

The second aim of the chapter was to examine the relation between disengagement and affective responses. Eisenberg and Fabes (1992) argue that individual differences in empathic responses may vary as a function of children's regulatory skills (see also Eisenberg, 2000b; Eisenberg, Fabes, Murphy, et al., 1996). Individual differences in children's affective responses to another's distress (i.e., the child's level of empathic arousal) are, therefore, expected to relate to their ability to enact behavioural strategies to regulate emotion. The findings of Chapters 3, 4 and 5 strongly suggest that children's expressions of sadness in response to an empathy inducing event are indicative of their empathy, whereas expressions of worry-concern are indicative of personal distress. Furthermore, the findings presented in Chapters 4 and 5 support Eisenberg and Fabes (1992); children expressing empathic sadness were emotionally well-regulated. In the current chapter, the relation between disengagement and affective responses is examined at both Time 1 and Time 2. It is hypothesised that children who are able to better regulate their emotional responses will be more empathic at both Time 1 and Time 2. Thus based on the findings presented in Chapter 4, children less likely to disengage from emotionally challenging vignettes are predicted to express more sadness when faced with an empathy eliciting vignette.

Finally, in research examining both emotion regulation strategies and affective responses to emotional events, gender is often considered as an important moderating variable (Underwood, 1997). Gender differences in children's behavioural responses have often been documented in the extant literature. For example, girls are typically more likely to express emotions, such as sadness and worry-concern, while boys tend to inhibit emotional responses (Eisenberg, Fabes, et al., 1988; Fuchs & Thelen, 1988; Saarni, 1999). In the longitudinal research reported by Hastings et al. (2000), it was shown that girls expressed greater concern compared to boys. Gender differences have also been found using teacher and parent report measures of regulation; for example, Eisenberg and colleagues (1996; Gurthrie, et al., 1997) found that girls were rated higher in attentional control, by both teachers and parents, compared to boys. However, gender differences are less apparent when using behavioural observations of disengagement (e.g., Gurthrie, et al., 1997). The current chapter, therefore, examines possible gender differences in children's disengagement and expressions of worry-concern and sadness. It is expected that there will be gender differences in the expressions of both worry-concern and sadness, such that girls reveal more affect than boys. Conversely, in keeping with Guthrie et al. (1997), no gender differences in observed disengagement are expected.

### **Summary**

In sum, this chapter presents an analysis of consistency and stability of disengagement and affective expressions (worry-concern and sadness) over a series of negatively-valenced emotionally challenging vignettes. The four challenging vignettes were chosen on the basis of Chapters 4 and 5, and comprise distressed infant (vignette 1), first day (vignette 3), social exclusion (vignette 7) and fear (vignette 8). Disengagement will be examined using CFA, which will allow the coherency across different vignettes to be explored, as well as an analysis of stability and mean change in disengagement over time. As disengagement is a prevalent and enduring response to emotional events throughout the life-span (Kopp, 1989), and it was found to be consistent across different vignettes in Chapter 4, it is hypothesised that children will employ disengagement in response to emotional events as a

coherent strategy at both Time 1 and Time 2. Furthermore, it is expected that children's use of disengagement will be stable across time. Finally, it is expected that the mean level of disengagement will decrease from Time 1 to Time 2.

With respect to expressions of worry-concern and sadness, the findings of Chapter 4 suggest that they are more contextually bound and, as such, these responses are not expected to be consistent across different vignettes. However, given the specificity of children's responses a degree of stability over time is expected for both worry-concern and sadness.

Finally, an exploration of the relation between disengagement and affect is presented. Based on the findings of Chapters 4 and 5, and the work of Eisenberg and Fabes (1992), it is expected that children expressing empathic sadness will disengage less from the challenging vignettes. Possible gender differences in children's disengagement and expressions of worry-concern and sadness will be examined where appropriate.

### **7.2 Analytic strategy**

Prior to the presentation of the methods and results for the current chapter, a brief outline of the analytic strategy used for the statistical modelling is undertaken.

#### **7.2.1 Confirmatory factor analysis**

Confirmatory factor analysis (CFA) is a statistical technique used to confirm the relationship between a set of observed measures or *indicators* (e.g., comprising test items, test scores, behavioural observation ratings, etc.) and their underlying latent construct (Brown, 2006). CFA is hypothesis-driven; that is, the researcher must have an a priori sense of the relationship between the indicators based on theoretical and empirical research. Thus, CFA is an important tool used in construct validation. Furthermore, CFA may be used to evaluate how well a measurement model fits across different groups or across time. This strength of CFA is particularly relevant to this thesis, allowing the equivalence of measures to be determined longitudinally.

CFA relies on multiple statistics in order to evaluate whether the proposed model provides a good fit to the observed data. The traditional goodness of fit index is chi-square, which tests the amount of difference between the observed and expected associations between indicators (expected and observed variance-covariance matrices). When chi-square is relatively small, with a probability level greater than 0.05, it indicates that there is no difference between the expected and observed covariance matrices and, therefore, the model fits the data well. However, chi-square is rarely used as the only index of model fit. The analyses presented herein also rely on the following indices to test model fit: Standardised Root Mean Square Residual (SRMR), Root Mean Square Error of Approximation (RMSEA), Comparative Fit index (CFI) and Tucker-Lewis Index (TLI). These fit indices provide information on three categories of model fit. First, SRMR, like chi-Square, is a test of absolute fit, and evaluates the hypothesis that the observed data is not significantly different from the expected data based on the model specification. Second, RMSEA is an index of fit that adjusts for model parsimony. RMSEA is similar to absolute fit indices but includes a penalty function for poor model parsimony. A more parsimonious model is one with a fewer number of freely estimated parameters. Finally, comparative fit indices, such as CFI and TLI, evaluate the fit of a model compared to a more restricted baseline model, typically a model where all covariances between indicators are set to zero.

Based on the work by Hu and Bentler (1999) and Brown (2006) the following conventions are commonly used as criteria to suggest *good* model fit:  $SRMR \leq 0.08$ ,  $RMSEA \leq 0.06$ , and  $CFI/TLI \geq 0.95$ . However, these values are frequently used as guidelines only, and values out of these ranges are often still used to indicate adequate model fit. The criteria of model fit statistics has been refined by Browne and Cudeck (1993), Brown (2006) and Bentler (1990) to include different degrees of model fit, they propose that *adequate* model fit is indicated by the following criteria:  $SRMR \leq 0.10$ ,  $RMSEA \leq 0.08$ , and  $CFI$  and  $TLI \geq 0.90$  and *mediocre* model fit indicated by the following:  $SRMR \leq 0.12$ ,  $RMSEA \leq 0.10$ , and  $CFI$  and  $TLI \geq 0.80$ .

However, fit indices alone do not imply a well fitting model, it is also important to examine individual parameter estimates; in particular, factor loadings,

latent factor variance, and the amount of variance in the indicators explained by the latent factor ( $R^2$ ). Once a model demonstrates good fit statistics, as well as significant factor loadings and robust  $R^2$ , the observed measures can be said to be reliable indicators of the underlying construct, and further analysis of the measurement properties of the indicators can be undertaken, such as measurement invariance and population homogeneity.

### **7.2.2 Measurement invariance and population homogeneity**

Longitudinal measurement invariance is a fundamental aspect necessary for evaluating temporal change in a construct (Brown, 2006). If measurement invariance across both time-points of a factor is unable to be established it suggests that there may be differences in the indicator measures or construct structure over time. That is, measurement error rather than a genuine change in the latent construct may be the source of temporal change. It is, therefore, necessary to establish measurement invariance prior to evaluating the possibility of mean differences in the construct over time.

To establish measurement invariance, the model is subjected to a series of parameter constraints to test for the equivalence of the measurement properties across time. If these additional constraints do not result in a decrease of model fit then measurement invariance at each step can be demonstrated. To test if a constrained model significantly reduces model fit a series of nested chi-square tests are conducted. There are four steps in total necessary for complete measurement invariance; (i) equal form (equivalent factor structure), (ii) equal factor loadings, (iii) equal intercepts, and (iv) equal error variance (Brown, 2006).

Once measurement invariance has been established it is possible to examine mean differences in the construct over time, that is, test for population homogeneity. In order to test for population homogeneity two further constraints are placed upon the model; (i) equal factor variance, to ensure that any differences in factor means are not due to differences in the range of indicator scores across time, and (ii) equal factor means. If this final constraint significantly degrades model fit then it can be concluded that there are significant differences in latent factor means across time.

## 7.3 Methods

### 7.3.1 Participants

Participants at Time 1 were the same as outlined in Chapter 4. At Time 2, 12 months later, 11 children (7 girls) did not participate in the emotion elicitation paradigm; 8 children were lost from the sample, and 3 children were absent from school on the days that testing took place. Thus, at Time 2 the sample comprised of 103 children (49 girls;  $M_{age} = 80$  months,  $SD = 4.8$  months).

### 7.3.2 Procedure

Children participated in the emotion elicitation paradigm at Time 2, and the procedure and stimuli were identical to that outlined in Chapter 4 for Time 1. Coding of behaviours at Time 2 followed identical scoring procedure as Time 1. However, at Time 2 presentation of the vignettes was counterbalanced, such that children were allocated to one of two vignette orders. Sixty-three children at Time 2 viewed vignettes 1 and 3 after vignette 7 and 8, while the remaining children received the same order of vignettes as Time 1. Two orders of video presentation were employed at Time 2 to ensure that vignette order was not having an undue effect on children's responding. To demonstrate that order was unrelated to behavioural responding it was necessary to show that there was an equivalent pattern of responding across the four vignettes.

A repeated measures ANOVA with vignette order as a between-subjects variable showed there was no significant interaction between vignette order and the amount of expressed worry-concern,  $F(3, 297) = .82$ ,  $p > 0.05$ , or sadness,  $F(3, 297) = .173$ ,  $p > 0.05$ , across the four vignettes. This non-significant finding suggests that the pattern of affective responding across the four vignettes is similar for both order conditions. There was, however, a significant interaction between vignette order and duration of disengagement across the four vignettes,  $F(3, 297) = 12.19$ ,  $p < 0.05$ . Inspection of the means shows that children who viewed vignette 1 and 3 first, showed greater disengagement compared to those that saw these vignettes last. Importantly, however, vignette 1 and 3 showed the greatest amount of disengagement across both orders of presentation.

To test that vignette 1 and 3 elicited significantly greater disengagement compared to vignettes 7 and 8 for both counterbalanced orders, two paired-samples t-test, one for each counter-balanced order was performed. Both showed vignette 1 and 3 elicited greater disengagement compared to vignette 7 and 8,  $t(37) = 6.57, p < 0.01$ ,  $t(62) = 3.07, p < 0.01$ , suggesting that the overall pattern of responding was highly consistent across the two vignette orders. For the purpose of the current analyses, which focus on the coherence and stability of behavioural responding over time, the non-significant order effect for the mean level of disengagement will not be dealt with further.

### **7.4 Results**

Descriptive statistics are presented first, followed by a CFA on durations of disengagement across the four emotionally challenging vignettes. This CFA is used to assess measurement invariance in disengagement across time, and allow a test of population homogeneity in the disengagement latent construct to analyse developmental change. Next, the consistency and stability of affective expressions across the four vignettes will be examined, with a specific focus on the empathy eliciting first day vignette (vignette 3). Finally, a structural equation model was conducted to explore the relation between disengagement and affective responding. Gender is examined as a possible covariate where appropriate.

#### **7.4.1 Descriptive statistics**

Durations of children's disengagement and expressions of worry-concern and sadness were coded in response to eight emotionally challenging vignettes at Time 1 and Time 2. As has been outlined in Chapter 4, eight vignettes were presented as part of the Emotion Elicitation Paradigm, however, only four vignettes were included in the current analyses: vignette 1 'distressed infant', vignette 3 'first day', vignette 7 'social exclusion', and vignette 8 'fear'. These four vignettes were chosen a priori for theoretical interest and they all shared themes of moderate to strong negative emotional content (see Chapter 4).

Overall, durations of disengagement, worry-concern, and sadness were calculated for each vignette and were converted to percentage duration to allow a

comparison between vignettes of different lengths. Descriptive statistics are shown in Table 7.1. There was a large amount of variation in disengagement and expressions of affect. As at Time 1, at Time 2 a large number of children disengaged from vignettes 1 and 3, while disengagement was less frequent in vignettes 7 and 8. In comparison, a smaller proportion of children were observed to express worry-concern across the four vignettes at Time 2.

Table 7.1

Means, standard deviations, range and percentage of children displaying disengagement, worry-concern and sadness across the 4 vignettes at Time 1 and Time 2

|               | Time 1      |           |              |          | Time 2      |           |              |          |  |
|---------------|-------------|-----------|--------------|----------|-------------|-----------|--------------|----------|--|
|               | <i>Mean</i> | <i>SD</i> | <i>Range</i> | <i>%</i> | <i>Mean</i> | <i>SD</i> | <i>Range</i> | <i>%</i> |  |
| Disengagement |             |           |              |          |             |           |              |          |  |
| Vignette 1    | 10.42       | 10.93     | 0 – 43.62    | 86       | 7.83        | 9.68      | 0 – 41.35    | 77       |  |
| Vignette 3    | 5.76        | 6.53      | 0 – 32.41    | 80       | 5.04        | 6.45      | 0 – 38.34    | 78       |  |
| Vignette 7    | 2.73        | 5.55      | 0 – 29.58    | 39       | 2.66        | 4.30      | 0 – 27.09    | 55       |  |
| Vignette 8    | 1.28        | 3.13      | 0 – 22.75    | 29       | 1.26        | 2.21      | 0 – 11.37    | 42       |  |
| Worry-Concern |             |           |              |          |             |           |              |          |  |
| Vignette 1    | 3.31        | 9.52      | 0 – 83.23    | 26       | 1.78        | 6.89      | 0 – 51.30    | 15       |  |
| Vignette 3    | 8.94        | 16.00     | 0 – 99.71    | 50       | 5.00        | 14.51     | 0 – 87.84    | 21       |  |
| Vignette 7    | 13.29       | 24.42     | 0 – 97.15    | 36       | 5.53        | 15.68     | 0 – 91.99    | 24       |  |
| Vignette 8    | 12.64       | 23.75     | 0 – 97.68    | 36       | 5.44        | 17.34     | 0 – 97.64    | 21       |  |
| Sadness       |             |           |              |          |             |           |              |          |  |
| Vignette 1    | 1.58        | 6.74      | 0 – 43.88    | 8        | 3.98        | 13.16     | 0 – 85.03    | 20       |  |
| Vignette 3    | 7.19        | 13.65     | 0 – 61.48    | 31       | 8.24        | 17.32     | 0 – 80.73    | 31       |  |
| Vignette 7    | 3.35        | 11.11     | 0 – 64.19    | 12       | 5.06        | 15.69     | 0 – 82.51    | 15       |  |
| Vignette 8    | 5.59        | 13.83     | 0 – 87.80    | 22       | 6.44        | 17.41     | 0 – 92.28    | 21       |  |

#### 7.4.2 Confirmatory factor analysis for disengagement

An inspection of the distribution of disengagement at Time 1 and Time 2 showed a positive skew. To model this data it was necessary to approximate normal distribution (Brown, 2006). Thus, a log transformation was applied at both time-points. This transformation improved the distributions (see Figure 7.1); transformed scores were used in the subsequent analyses.

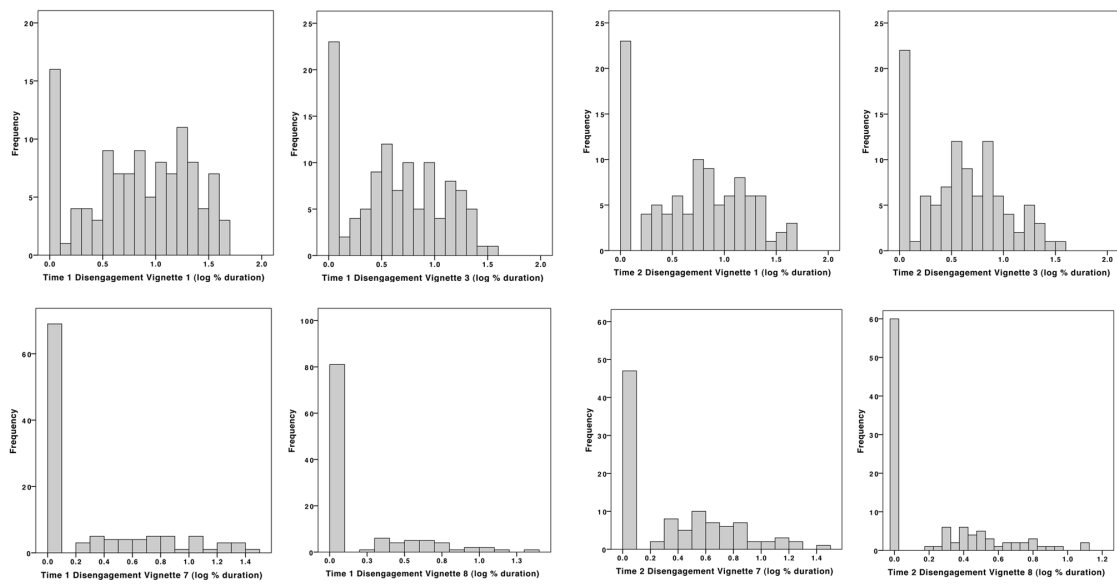


Figure 7.1. Histograms of children’s Time 1 and Time 2 log-transformed % duration of disengagement, for vignettes 1, 3, 7 and 8

Table 7.2 shows the pattern of bivariate relations for (log-transformed) disengagement across the four vignettes at both Time 1 and Time 2. At both time-points there were significant positive correlations in the use of disengagement across vignettes. In addition, there were significant longitudinal correlations in the use of disengagement across the four vignettes across time-points. These significant correlations both within and across time suggest that the duration of disengagement over the four vignettes may be used as indicators to model a latent factor for disengagement at each time-point.

Table 7.2

Bivariate correlations for children's log-transformed disengagement duration across the four vignettes at Time 1 and Time 2

|                              |    | Time 1 Disengagement |       |       |       | Time 2 Disengagement |       |       |       |
|------------------------------|----|----------------------|-------|-------|-------|----------------------|-------|-------|-------|
|                              |    | V1                   | V3    | V7    | V8    | V1                   | V3    | V7    | V8    |
| Time 1<br>Disengagement<br>t | V1 | –                    | .37** | .31*  | .09   | .26**                | .20*  | .11   | .12   |
|                              | V3 |                      | –     | .34** | .25** | .18                  | .13   | .19   | .22*  |
|                              | V7 |                      |       | –     | .20*  | .28*                 | .20*  | .15   | .06   |
|                              | V8 |                      |       |       | –     | -.07                 | -.10  | .17   | .25*  |
| Time 2<br>Disengagement<br>t | V1 |                      |       |       |       | –                    | .51** | .21*  | .20   |
|                              | V3 |                      |       |       |       |                      | –     | .30** | .18   |
|                              | V7 |                      |       |       |       |                      |       | –     | .32** |
|                              | V8 |                      |       |       |       |                      |       |       | –     |

\* $p < 0.05$ ., \*\*  $p < 0.01$ . Note: V1 = distressed infant, V3 = first day, V7 = social exclusion, V8 = fear.

As shown in Figure 7.2, a model was specified in which measures of the log-duration of disengagement across the four emotionally evocative vignettes loaded onto a latent disengagement factor at each time-point. The latent factors for disengagement at Time 1 and Time 2 were permitted to be correlated. The model was over-identified<sup>5</sup> with 19 *df* and  $\chi^2 = 28.90$ ,  $p = 0.07$ . The overall goodness-of-fit indices suggested largely adequate model fit: SRMR = 0.07, RMSEA = 0.07, CFI = 0.90 and TLI = 0.85. Unstandardised and completely standardised parameter estimates from this solution are presented in Figure 7.2. All parameters were statistically significant. The amount of variance explained by the latent factors was significant for Vignettes 1, 3 and 7 at Time 1 and Vignette 1 and 3 at Time 2, while  $R^2$  for vignette 7 at Time 2 was marginal ( $R^2 = .11$ ,  $p = .06$ ). These parameter estimates suggest that observed measures of disengagement during vignettes 1, 3 and 7 at each time-point are reliable indicators of the underlying construct of disengagement. However,  $R^2$  for Vignette 8 at both Time 1 and Time 2 were not significant,  $R^2 = .08$  and  $.11$ ,  $p = .22$  and  $.14$  respectively, suggesting that vignette 8 was not a reliable indicator of the

<sup>5</sup> A model is over-identified when the number of knowns (i.e., number of covariances and variances in the input matrix) exceeds the number of freely estimated parameters.

underlying construct of disengagement. Nevertheless, Vignette 8 was retained in the overall model because the factor loading estimates were significant at both Time 1 and Time 2, implying that disengagement during vignette 8 was related to the latent disengagement factors. The model presented in Figure 7.2 also shows that there is a significant relation between the two latent factors.

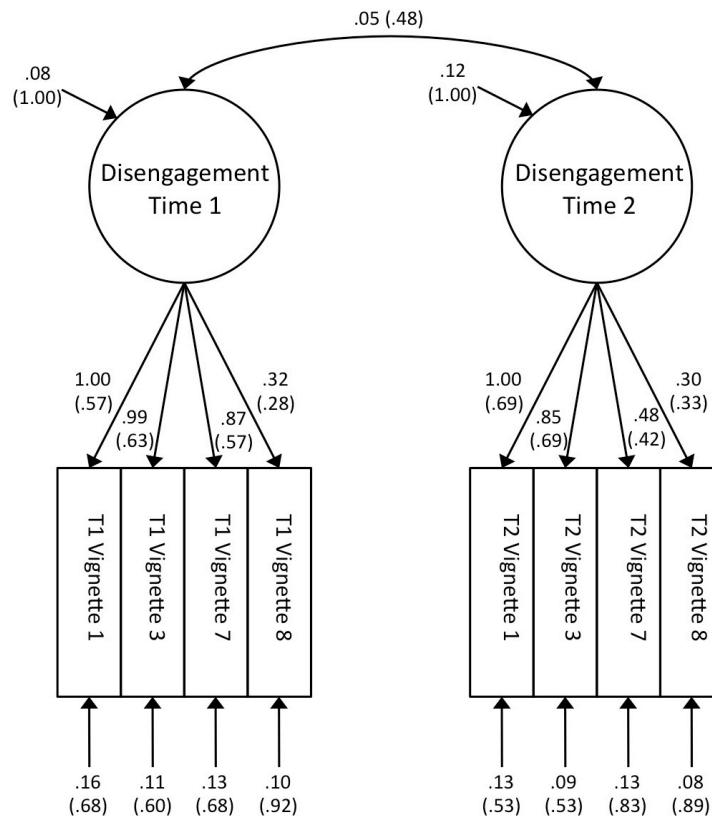


Figure 7.2. Unstandardised and completely standardised parameter estimates from the CFA model of disengagement at Time 1 and Time 2. Completely standardised parameter estimates are presented in parentheses. All freely estimated parameter estimates are statistically significant,  $p < 0.05$ .

Overall, examining both fit indices and parameter estimates, modelling a higher-order construct of disengagement across the four different emotional vignettes at both time points provides a good fit to the data. Thus, this CFA will be used in the structural model examining the relations between disengagement and affective responding (in Section 7.4.4).

Having established an underlying construct of disengagement across both time-points, longitudinal measurement invariance was assessed to examine the

measurement properties of disengagement over time. As previously noted, there are four steps necessary for complete measurement invariance, (i) equal form (ii) equal factor loadings, (iii) equal intercepts and (iv) equal error variance. Each of these steps will be tested in turn.

To test whether the factor structure was equivalent at both time-points, the model shown in Figure 7.2 was constrained to equal form by fixing the mean of the latent construct to zero at both time-points,  $\chi^2(19) = 28.90, p = 0.07$ .

Table 7.3.  
Longitudinal Measurement Invariance and Population Homogeneity across Time 1 and Time 2 for CFA of Disengagement

|                              | $\chi^2$ | <i>df</i> | <i>p</i> | $\chi^2_{diff}$ | $\Delta df$ |
|------------------------------|----------|-----------|----------|-----------------|-------------|
| Measurement Invariance       |          |           |          |                 |             |
| Equal form                   | 28.90    | 19        | .07      | -               | -           |
| Equal loadings               | 30.90    | 22        | .10      | 2.00            | 3           |
| Equal indicator intercepts   | 40.33    | 26        | .04      | 9.43            | 4           |
| Equal residual variance      | 41.94    | 30        | .07      | 1.61            | 4           |
| Population Homogeneity       |          |           |          |                 |             |
| Equal latent factor variance | 40.99    | 30        | .09      | -               | -           |
| Equal latent factor means    | 42.00    | 31        | .09      | .01             | 1           |

Note:  $\chi^2_{diff}$ , nested  $\chi^2$  difference

Next, the model was assessed for the equality of factor loadings across time by imposing an equality constraint on pairs of factor loadings across time for each indicator. For example, the factor loading of vignette 1 at both Time 1 and Time 2 were held to be equal. The model fitted the data well with this additional constraint (see Table 7.3). A nested  $\chi^2$  test showed that constraining factor loadings to equality did not significantly reduce model fit. The constrained model did not produce a significant reduction in fit relative to the corresponding unconstrained solution suggesting that the indicators have an equivalent relationship to the disengagement latent construct over the two time-points.

The model was then tested for the equality of indicator intercepts, with the intercepts of each pair of indicators over time held to equality. The model fitted the

data well, and the  $\chi^2$  difference test showed that the addition of these constraints did not significantly reduce model fit (see Table 7.3). As measurement invariance in the intercepts was supported, it suggests that observed levels of disengagement at a given level of the latent variable is equivalent across time.

Finally, the model was tested for equality of the indicators' error variances. That is, the error variance of pairs of like indicators were held to equality across time-points. This model fitted the data well, and a  $\chi^2$  difference test showed that the addition of these constraints did not significantly reduce model fit (see Table 7.3). Equality of indicator error variances suggests that each indicator's error variances remained consistent across time.

As factor loading, indicator intercepts, and indicator error variance were invariant across time, full measurement invariance was supported. It can be concluded, therefore, that the measurement properties of disengagement are equivalent across time. Thus, subsequent comparisons of latent factor means for (log-transformed) disengagement are meaningful, such that differences between the latent variable from Time 1 to Time 2 may be interpreted as a genuine difference rather than simply an artefact in the measurement properties of disengagement across the four vignettes.

To examine mean differences in the disengagement latent factor from Time 1 to Time 2 the model was subjected to a test of population homogeneity. To achieve this, two further constraints are placed upon the model: (i) equal factor variance, and (ii) equal factor means.

Constraining the disengagement latent factor variances to equality across Time 1 and Time 2 fit the model well (See Table 7.3). This suggests that the range of the latent factor for disengagement at Time 1 and Time 2 was similar. When within-group variability of the disengagement latent factors was held constant the completely standardised latent factor mean for disengagement at Time 1 was 2.56 and at Time 2 was 2.41. In order to test whether this difference was significant, latent factor means were constrained to equality at both time points. Constraining factor means to equality fit the model well, and did not result in a significant degradation in model fit (see Table 7.3). As the constraint of the two factor means to

equality did not result in poor model fit it may be concluded that there is no significant difference in the overall amount of disengagement shown between Time 1 and Time 2. This finding did not support the hypothesis that children would be observed to use less disengagement at Time 2 compared to Time 1.

To investigate the possible association between gender and disengagement, a Multiple Indicators, Multiple Causes (MIMIC) model was used. This approach was taken as an alternative to multiple-groups CFA, where separate CFAs are run for each group and compared, as the current sample size was too small (Brown, 2006). In a MIMIC model, latent factors are regressed onto covariates that represent group membership, if the covariate has a significant effect on the latent factor it implies population heterogeneity, that is, the factor means vary for different levels of the covariate.

The disengagement latent factors at both Time 1 and Time 2 were regressed onto gender (0 = male, 1 = female; see Figure 7.3). The model was over-identified with 25 *df* and  $\chi^2 = 34.54$ ,  $p = 0.10$ . Each of the overall goodness-of-fit indices suggested largely good model fit; SRMR = 0.07, RMSEA = 0.06, CFI = .91 and TLI = 0.87. Unstandardised and completely standardised parameter estimates from this solution are presented in Figure 7.3. There was a significant effect of gender on disengagement at Time 2, suggesting that the latent disengagement means of boys and girls differ, such that boys were 0.63 standardised scores higher on the latent dimension of disengagement compared to girls at Time 2.

However, to confirm whether there was a significant overall gender difference in disengagement, comparing Time 2 to Time 1, the effect of gender on disengagement at Time 1 and 2 was constrained to equality. If the constrained model does not result in a significant reduction in model fit (compared to the model where the parameter estimates for sex were freely generated) then it can be concluded that there is no significant difference between the gender effect at Time 1 and Time 2 on disengagement. The constrained model fit the data well,  $\chi^2 = 36.39$ , *df* = 26,  $p = 0.09$ , and the overall goodness-of-fit indices suggested good model fit; SRMR = 0.07, RMSEA = 0.06, CFI = .90 and TLI = 0.86. A  $\chi^2$  difference test showed that the addition of these constraints did not significantly reduce model fit,  $\chi^2_{\text{diff}} =$

1.85,  $\Delta df = 1$ ,  $p > 0.05$ , indicating that gender has the same relationship to the underlying construct of disengagement at both Time 1 and Time 2.

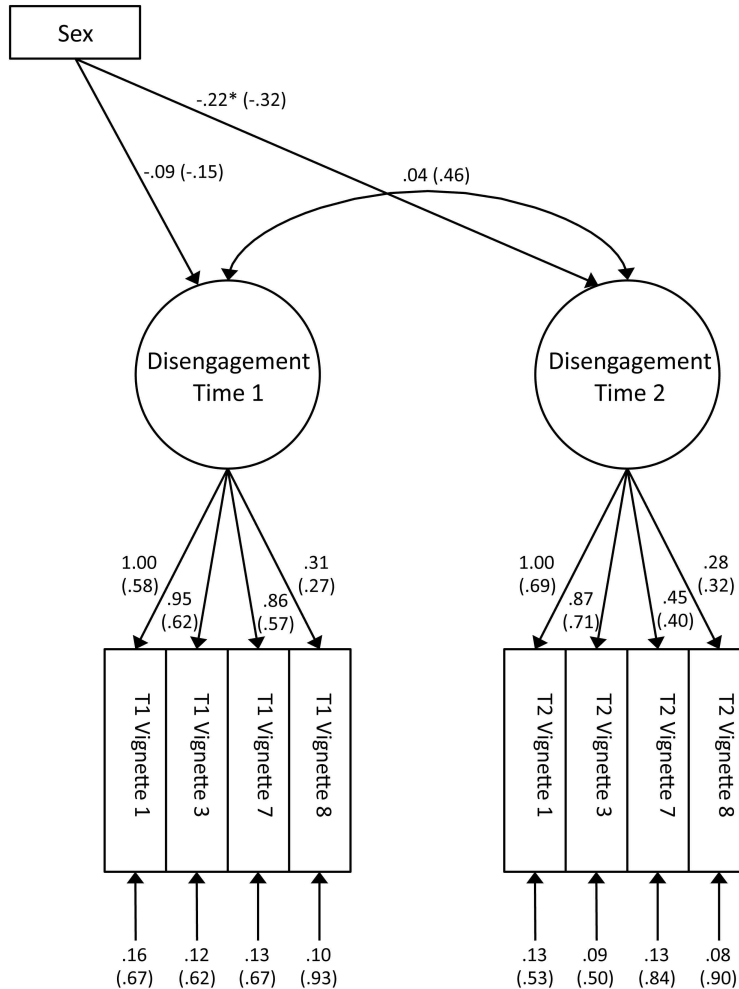


Figure 7.3. Unstandardised and completely standardised parameter estimates from the CFA model of disengagement at Time 1 and Time 2 with gender as a covariate. Completely standardised parameter estimates are presented in parentheses, \* $p < 0.05$ , \*\* $p < 0.01$ .

**Summary: Disengagement**

The CFA and subsequent test of population homogeneity for disengagement strongly suggest that disengagement is a consistent behavioural response enacted by children across different emotionally evocative events. Furthermore, the pattern of children’s disengagement was found to be stable over time. A test of population homogeneity implied that children do not differ in the amount of disengagement they perform to the same emotion vignettes from Kindergarten to Year 1. Finally,

although there was a trend for boys to show greater disengagement compared to girls at Time 2, constraining the relation between the underlying construct of disengagement and gender at both time-points indicated that the gender difference was not significant.

The following analysis examines the longitudinal stability and independence of worry-concern sadness expressions.

### **7.4.3 Longitudinal stability and independence of worry-concern and sadness**

The findings presented in Chapters 4, in addition to Table 7.1, show the low percentage of children expressing either worry-concern or sadness across the four vignettes. In particular, expressions of sadness appear limited to those vignettes that elicited empathic responses; as such, it is inappropriate to model these data using CFA. Although worry-concern was also observed in a relatively low percentage of children at Time 1 it did appear to be a more consistent response across the four vignettes compared to sadness (see Chapter 4).

Table 7.4 shows the pattern of bivariate relations for expressions of worry-concern across the four vignettes at both Time 1 and Time 2. At both time-points there were robust positive correlations in the expression of worry-concern across vignettes. In addition, there were significant longitudinal relations in worry-concern across the four vignettes.

Table 7.4  
Bivariate correlations for children's expressions of worry-concern across the four vignettes at Time 1 and Time 2.

|                         |    | Time 1 Worry-concern |       |       |       | Time 2 Worry-concern |       |       |       |
|-------------------------|----|----------------------|-------|-------|-------|----------------------|-------|-------|-------|
|                         |    | V1                   | V3    | V7    | V8    | V1                   | V3    | V7    | V8    |
| Time 1<br>Worry-concern | V1 | –                    | .59** | .46*  | .40** | .05                  | .39** | .44** | .38** |
|                         | V3 |                      | –     | .53** | .50** | .04                  | .48** | .45** | .32*  |
|                         | V7 |                      |       | –     | .72** | .19                  | .30** | .36*  | .30** |
|                         | V8 |                      |       |       | –     | .12                  | .31** | .38** | .34** |
| Time 2<br>Worry-concern | V1 |                      |       |       |       | –                    | .18   | .23*  | .48** |
|                         | V3 |                      |       |       |       |                      | –     | .62** | .53** |
|                         | V7 |                      |       |       |       |                      |       | –     | .87** |
|                         | V8 |                      |       |       |       |                      |       |       | –     |

\* $p < 0.05$ , \*\*  $p < 0.01$ . Note: V1 = distressed infant, V3 = first day, V7 = social exclusion, V8 = fear.

Table 7.5 shows the pattern of bivariate relations for expressions of sadness across the four vignettes at both Time 1 and Time 2. At both time-points there were significant positive correlations for sadness across vignettes, as well as significant longitudinal relations in sadness across the four vignettes. However, caution should be taken when interpreting these findings given the low percentage of children expressing sadness in vignettes 1 and 7, particularly at Time 1.

Table 7.5  
Bivariate correlations for children's expressions of sadness across the four vignettes at Time 1 and Time 2

|                   |    | Time 1 Sadness |       |     |       | Time 2 Sadness |       |       |       |
|-------------------|----|----------------|-------|-----|-------|----------------|-------|-------|-------|
|                   |    | V1             | V3    | V7  | V8    | V1             | V3    | V7    | V8    |
| Time 1<br>Sadness | V1 | –              | .36** | .04 | .02   | .02            | .00   | .26** | .11   |
|                   | V3 |                | –     | .12 | .38** | .24*           | .23*  | .44** | .16   |
|                   | V7 |                |       | –   | .36** | .32**          | .06   | .31** | .19   |
|                   | V8 |                |       |     | –     | .07            | .07   | .22*  | .12   |
| Time 2<br>Sadness | V1 |                |       |     |       | –              | .53** | .65** | .63** |
|                   | V3 |                |       |     |       |                | –     | .56** | .63** |
|                   | V7 |                |       |     |       |                |       | –     | .69** |
|                   | V8 |                |       |     |       |                |       |       | –     |

\* $p < 0.05$ , \*\*  $p < 0.01$ . Note: V1 = distressed infant, V3 = first day, V7 = social exclusion, V8 = fear.

Given the low frequency of both worry-concern and sad expressions, a total duration for each across the four vignettes was calculated to examine the overall longitudinal stability of these expressions. Table 7.6 shows robust stability from Time 1 to Time 2 within both affective expressions but virtual independence between expressions of worry-concern and sadness.

Table 7.6 Bivariate correlations between total worry-concern and sadness in vignettes 1, 3, 7 and 8 at Time 1 and Time 2

|                         | 1 | 2   | 3     | 4     |
|-------------------------|---|-----|-------|-------|
| 1. Time 1 Worry-concern | – | .12 | .49** | .13   |
| 2. Time 1 Sadness       |   | –   | -.12  | .32** |
| 3. Time 2 Worry-concern |   |     | –     | -.09  |
| 4. Time 2 Sadness       |   |     |       | –     |

\*\*  $p < 0.01$ .

To further examine the longitudinal stability and independence of worry-concern and sadness, a path model was constructed based on these expressions solely during the empathy eliciting vignettes (vignette 3; see Figure 7.4). As outlined

in Chapter 4, and supported in Chapter 5, the empathy eliciting vignette was theoretically chosen to elicit both expressions of worry-concern and sadness. Log-transformed duration scores were used for worry-concern and sadness expressions at both time-points to improve the range of these distributions, although there was still substantial positive skew due to the large number of children who did not express any worry-concern or sadness during vignette 3.

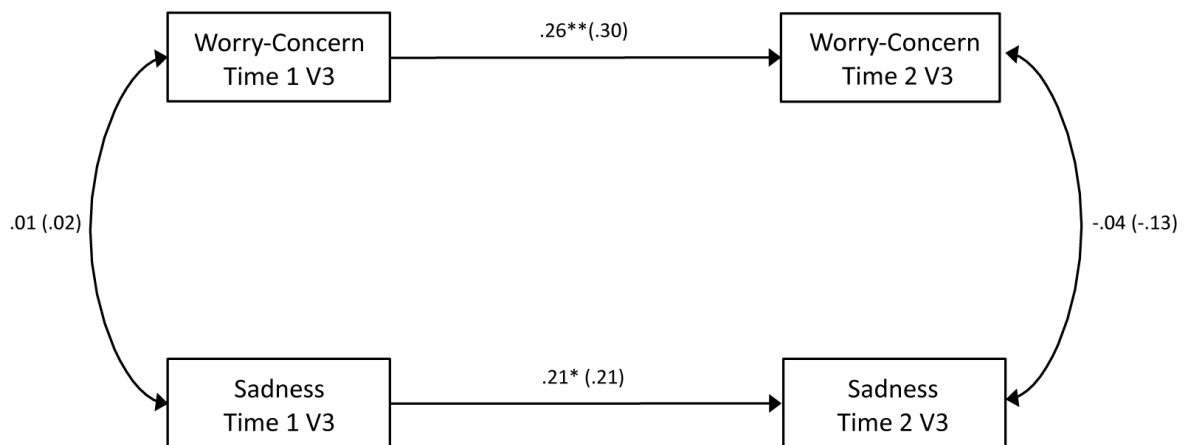


Figure 7.4. Unstandardised and completely standardised parameter estimates of the path model for worry-concern and sadness at Time 1 and Time 2. Completely standardised parameter estimates are presented in parentheses, \* $p < 0.05$ , \*\* $p < 0.01$ .

The path model fit the data well,  $\chi^2 = .71$ ,  $df = 2$ ,  $p = 0.70$ . Each of the overall goodness of fit indices suggest good model fit: SRMR = 0.03, RMSEA = 0.00 CFI = 1.00 and TLI = 1.26. There was significant longitudinal stability in the expression of both worry-concern and sadness in vignette 3 from Time 1 to Time 2. However, there was no concurrent relation between worry-concern and sadness at either Time 1 or Time 2, providing further support that these expressions are independent. To confirm this conclusion, the path model was re-run fixing the covariance between worry-concern and sadness to zero at each time-point. The constrained model fit the data well,  $\chi^2 = 2.57$ ,  $df = 4$ ,  $p = 0.63$ , and each of the overall goodness-of-fit indices suggested a good model fit; SRMR = 0.05, RMSEA = 0.00, CFI = 1.00 and TLI = 1.14. A  $\chi^2$  difference test showed that the addition of these constraints did not significantly reduce model fit,  $\chi^2_{diff} = 1.86$ ,  $\Delta df = 2$ ,  $p > 0.05$ , establishing the independence of worry-concern and sadness at each time-point. Finally, as an addition check, an examination of the

longitudinal impact of Time 1 sadness on Time 2 worry-concern, and Time 1 worry-concern on Time 2 sadness was examined. This model revealed no significant relation between the two expressions over time providing further support for the longitudinal independence of worry-concern and sad expressions.

In order to explore the impact of gender on worry-concern and sadness at Time 1 and Time 2, gender was added to the path analysis exploring the longitudinal stability of worry-concern and sadness (see Figure 7.5). Gender was included as a covariate for worry-concern and sadness at both Time 1 and Time 2. With the inclusion of gender, the model continued to fit the data well,  $\chi^2 = 2.69$ ,  $df = 4$ ,  $p = 0.61$ . Each of the overall goodness of fit indices suggest good model fit, SRMR = 0.04, RMSEA = 0.00 CFI = 1.00 and TLI = 1.25.

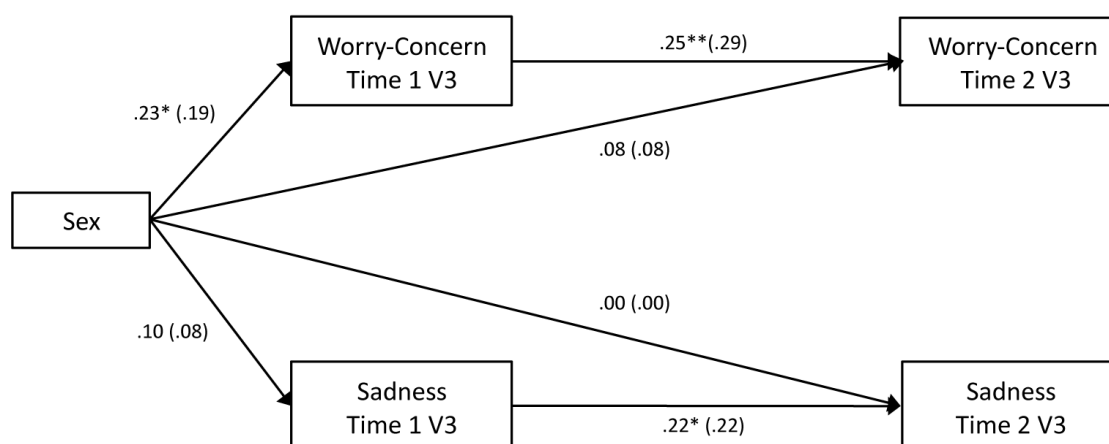


Figure 7.5. Unstandardised and completely standardised parameter estimates of the path model for worry-concern and sadness at Time 1 and Time 2, including gender as a covariate. Completely standardised parameter estimates are presented in parentheses, \* $p < 0.05$ , \*\* $p < 0.01$ .

There was a significant effect of gender on Time 1 worry-concern, with girls expressing 0.19 standardised scores more worry-concern compared to boys in response to vignette 3. There was no such difference in worry-concern expressions by gender at Time 2. To test if the gender difference found at Time 1 was different to the non-significant relation between gender and worry-concern at Time 2 these parameter estimates were constrained to equality across time. There was no significant reduction in model fit, a  $\chi^2$  difference test showed that the addition of

this constraint did not significantly reduce model fit,  $\chi^2_{diff} = 1.00$ ,  $\Delta df = 1$ ,  $p > 0.05$ , suggesting that there is no difference in the amount of worry-concern expressed between boys and girls from Time 1 to Time 2.

Finally, the longitudinal stability of affective responses at Time 1 and Time 2 was explored using the affect categorisations based on children's expressions of affect in vignette 3 only. Affect classifications, outlined in Chapters 3 and 4, comprised inexpressive, worry-concern and sad categories. Examining the longitudinal stability in affect categories shows that there was significant continuity in children's affect categorisation from Time 1 to Time 2,  $\chi^2_4(N = 101) = 10.32$ ,  $p < 0.05$ , confirming the findings of the path model outlined above. Of children expressing worry-concern at Time 1, 33% remained categorised as worry-concern at Time 2, and 43% of children categorised as sadness at Time 1 remained in this category at Time 2. If children did change affect classifications from Time 1 to Time 2 they were more likely to move away from both worry-concern and sad categories to the inexpressive category; 43% of children who were categorised as sad, and 50% of those categorised as worry-concerned at Time 1 were categorised as inexpressive at the second time-point. Finally, only 13% of children categorised as sad at Time 1 were worry-concerned at Time 2, and only 16% of those categorised as worry-concerned were categorised as sad at Time 2. This finding suggests that there was little movement between worry-concern and sad categories over time, provides further evidence for the longitudinal independence of these two expressive responses to an empathy eliciting event.

#### **7.4.4 Concurrent and longitudinal relations between disengagement and expressions of worry-concern and sadness**

The relation between children's disengagement and affect was first examined using the affect categorisations. As outlined in Chapter 4, there was a marginally significant difference in the duration of disengagement with respect to affect group categorisations at Time 1,  $F(2, 110) = 2.37$ ,  $p < 0.10$ . Follow-up contrast analyses indicated that worry-concern children displayed significantly more disengagement compared to children expressing predominately sadness. There was no significant difference in disengagement as a function of affect group at Time 2.

Although affect group categorisations are used in the literature (e.g., Cole, et al., 1996), in order not to lose information about individual differences in affective responding, especially in regards to changes in duration of affective responding from Time 1 to Time 2, the relation between disengagement and affective responding was also explored using duration scores. Specifically, the relation between affect and disengagement was explored using structural equation modelling (SEM). Expressions of worry-concern and sadness during vignette 3 and the disengagement latent factor (see Section 7.4.2) across Time 1 and Time 2 were included in the model. Gender was not included in the model as the findings above do not suggest a strong influence of gender on either disengagement or affect.

As shown in Figure 7.6, a model was specified in which the disengagement latent factors at Time 1 and Time 2 were modelled with worry-concern and sadness at both time-points as covariates. The model fit the data well,  $\chi^2 = 63.83$ ,  $df = 51$ ,  $p = 0.11$ , and each of the overall goodness-of-fit indices suggested adequate model fit; SRMR = 0.08, RMSEA = 0.05, CFI = .89 and TLI = .86. There was significant longitudinal stability in all three behavioural measures. In addition, there was a significant concurrent relation between disengagement and expressions of sadness at Time 1 such that children who disengaged more were .24 standardised scores less likely to express sadness.

To test if the relation between disengagement and sadness found at Time 1 was significantly different to the relation between sadness and disengagement at Time 2, these parameter estimates were constrained to equality across time. The constrained model fit the data well,  $\chi^2 = 66.37$ ,  $df = 52$ ,  $p = 0.09$ , and each of the overall goodness-of-fit indices suggested a good model fit; SRMR = 0.08, RMSEA = 0.05, CFI = .88 and TLI = .85. A  $\chi^2$  difference test showed that the addition of this constraint did not significantly reduce model fit,  $\chi^2_{diff} = 2.54$ ,  $\Delta df = 1$ ,  $p > 0.05$ , suggesting that there is no difference in the relation between sadness and disengagement at Time 1 and Time 2.

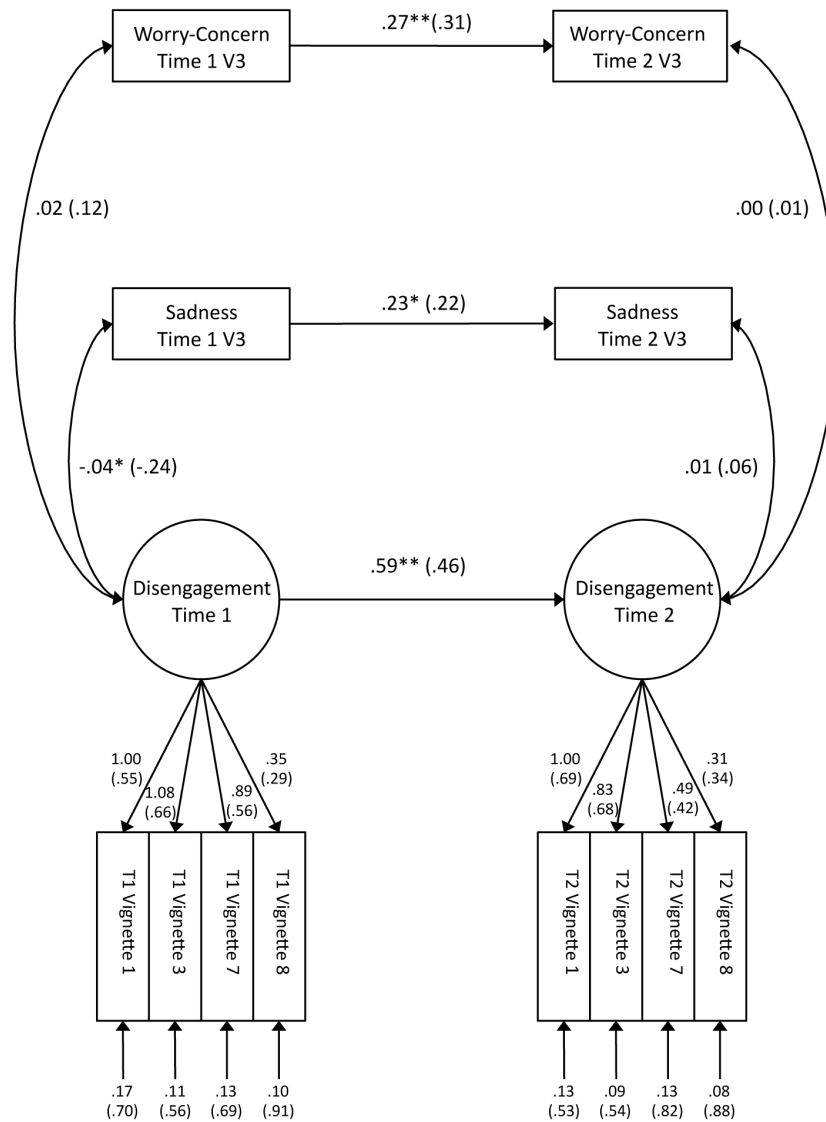


Figure 7.6. Unstandardised and completely standardised parameter estimates from modelling disengagement as a latent factor and sadness and worry-concern as covariates at Time 1 and Time 2. Completely standardised parameter estimates are presented in parentheses, \*p < 0.05, \*\*p < 0.01.

### 7.5 Discussion

The current analyses extend the findings outlined in Chapter 4 by examining both the consistency and longitudinal stability of children’s disengagement and affective expressions across different emotional events. Disengagement was found to be highly consistent across different vignettes at both Time 1 and Time 2, and was also a stable characteristic of the child’s responding across time-points. Furthermore, given the close theoretical and methodological association between children’s emotion regulation and empathy, the current study examined the

concurrent and longitudinal relations between disengagement and affective expressions. While there was a significant association between emotionally well-regulated responding and empathic sadness at Time 1, this relation was not observed at Time 2.

Examining the structure and stability of disengagement across four distinct emotionally challenging events showed that children's use of disengagement was a consistent behavioural response observed in children across multiple challenging events. In addition, there was robust longitudinal stability in children's behavioural responses from five to six years of age. A test of measurement invariance provides evidence for the equality of the measurement of disengagement over the two time-points, that is, the four vignettes were a comparable index of children's disengagement at both Time 1 and Time 2. In addition, a test of population homogeneity implied that there were no age-related changes in the overall mean level of children's disengagement. This finding was unexpected, as it was predicted that the mean level of disengagement would decrease from Time 1 to Time 2. Long though a year may seem, it did not affect the overall level of disengagement. It is, nevertheless, possible that the mean level of disengagement may decrease over a larger developmental window. The fact that children did not differ in their use of disengagement from Time 1 to Time 2 suggests that emotional responding across these ages is similar. However, as seen in Chapter 4, there was a similar mean level of disengagement across the challenging vignettes (vignettes 1,3, 7 and 8) and the less challenging vignettes (vignettes 2, 4, 5 and 6), what was different across these contexts was the relation between disengagement and social adaptation. Thus, although a similar amount of disengagement was viewed across Time 1 and Time 2, the meaning of this disengagement may have differed. Overall, the CFA for disengagement demonstrated the stability and consistency with which children employ this behavioural strategy when faced with an emotional challenge, both across contexts and across time.

The consistency and stability of affective responses were examined using more traditional methods because the distribution of these responses were not appropriate for CFA. The pattern of correlations across vignettes for worry-concern

indicated that this response was consistent across different challenging events at both Time 1 and Time 2. Furthermore, worry-concern appeared to be a stable response across time. However, given the small proportion of children expressing worry-concern, this finding must be interpreted cautiously. Compared to worry-concern, there was a less consistent pattern of correlations for expressions of sadness both across vignette and across time. This was to be expected given the contextually bound nature of empathic sadness expressions. The modest coherence of children's expressions of sadness pose some problems for the interpretation of affective responding when aggregated across a series of different emotionally evocative events. From a conceptual standpoint, aggregated affective responses across different situational contexts may reflect children's temperamental predisposition toward certain emotional responses, rather than their specific response to a certain eliciting event. While there is little doubt that children's temperament impacts upon their ability or inability to adequately regulate their affective responses (see Chapter 1, Section 1.3.1), when interpreting the implications of certain responses there must be a distinction between the assessment of temperamental measures of children's affective responses averaged across over a number of challenging events, and affective measures of empathy (or, indeed, emotion regulation) which are examined in a specific situational context.

To overcome the potential problem with aggregating children's affective responses across different contexts, the stability and independence of affective responses was examined using a single vignette: vignette 3 was chosen because it was predicted a priori to elicit empathic responses in typical children. Furthermore, children's expressions of worry-concern and sadness in responses to vignette 3 has been examined in some detail in Chapters 4, 5 and 6. The current findings suggest that children's expressions of worry-concern and sadness in response to vignette 3 were moderately stable across Time 1 to Time 2, implying that children are likely to respond to this vignette in the same manner at both time-points. In addition, children's overall affective response to the four vignettes was also stable across time.

An examination of the concurrent relation between expressions of worry-concern and sadness in response to vignette 3 demonstrated a profound independence in these expressions at both time-points and longitudinally, suggesting that, at least in the specific empathy eliciting context, expressions of worry-concern and sadness represent a manner of responding that taps strong individual differences. This result is consistent with other findings presented in this thesis. Chapters 4 and 6 demonstrated a unique pattern of associations between affective expressions of children's social adaptation. Furthermore, Chapter 5 demonstrated different patterns of physiological responding that were associated with expressions of sadness and worry-concern. The current chapter provides further evidence for the independence of children's expressions of worry-concern and sadness at both time-points. Indeed, examination of longitudinal stability in affect categorisation supports this conclusion, relatively few children move between worry-concern and sad affect categories over the year.

Regarding gender, there was a modest trend for boys to show less worry-concern at Time 1 and greater disengagement at Time 2 when compared to girls. There was no gender difference in expressions of sadness at either time-point. This finding is consistent with the trend presented in Chapter 6, girls were more likely to express worry-concern while boys were more likely to be inexpressive at Time 1. There have been mixed findings in the literature regarding gender differences in disengagement. For example, Eisenberg et al. (1994) examined children's behavioural responses to naturally occurring anger in the playground and found that girls were more likely to respond with avoidance compared to boys. Conversely, other studies observing children's behavioural responses to challenging video vignettes have failed to find a difference between the mean level of disengagement for girls and boys (e.g., Gurthrie, et al., 1997). Despite the observation that it is typical for girls to express greater affect compared to boys (e.g., Hastings, et al., 2000; Saarni, 1999), the current findings suggest that gender differences in children's behavioural responses to challenging events are small to negligible. Nevertheless, it is interesting to note that, in the current study, there were no gender differences in the expression of sadness, conceptualised as an empathic response to another's

plight. These findings suggest that while there are modest gender differences in children's non-empathic affective responding, empathy responses are equally likely across both boys and girls.

Finally, the relation between children's disengagement and affect was examined. Given the close relation between emotion regulation and empathy, it was expected that children who were well-regulated would also express affective empathy. This prediction was partially supported; children who disengaged less from the challenging vignettes were more likely to express sadness. However, this association was only significant at Time 1. There was no relation between disengagement and sadness at Time 2, nor was there a significant association between disengagement and expressions of worry-concern at either time-point. This finding partially supports the conceptual association between children's emotion regulation and empathy, at least for the Time 1 data: those children who were better regulated were more likely to be empathic.

In fact, the findings of the current chapter suggest that overall while there were concurrent relations between children's responses at Time 1 there was no such association across responses at Time 2. This may be because the challenging vignettes no longer have the same degree of salience for the older child. In particular, the empathy eliciting vignette, upon which the affect data is derived, depicts a young child distressed on his first day of school. At the initial time-point this event may have been meaningful and relevant to the sample given their own recent transition to school. By Time 2, one year later, this event may no longer be so directly relevant to the majority of children. Further research is needed to examine the stability of children's behavioural and affective across both the same and different challenging events, making sure to employ situational contexts that are developmentally appropriate.

In conclusion, the findings of the current chapter extend those presented in Chapters 4 and 5 by providing a further analysis of children's behavioural responses to challenging events over time and demonstrates the longitudinal stability in these behavioural responses. It was shown in Chapters 4 and 6 that children's behavioural responses to emotionally challenging events are related to their social

competencies. The following chapter examines the concurrent and longitudinal relation between children's behavioural responses to emotional events and their social competence at both Time 1 and Time 2. Although children's expressions of worry-concern and sadness showed a moderate level of stability from Time 1 to Time 2, they were derived from a single vignette. Given that the majority of children were inexpressive in response to this vignette at both Time 1 and Time 2, the longitudinal relation between affect and social adaptation is examined in Chapter 9 using affect group (i.e., inexpressive, worry-concern, sad). The following chapter focuses exclusively on the longitudinal relation between disengagement and social competence.

## Chapter Eight

### The Longitudinal Relation Between Emotion Regulation and Social Adaptation

#### 8.1. Introduction and aims

In Chapter 7 it was shown that individual differences in children's disengagement from challenging events was a consistent behavioural responses across a series of contexts, as well as a stable characteristic of the child across time. Expressions of worry-concern and sadness, although moderately stable from Time 1 to Time 2, were not modelled using CFA like disengagement but instead were derived from a single empathy eliciting vignette. Furthermore, the majority of children were inexpressive in response to this vignette at both Time 1 and Time 2. As such, the longitudinal relation between affect and social adaptation is examined in Chapter 9 using affect group (i.e., inexpressive, worry-concern, sad) in place of a duration score. The separate longitudinal examination of disengagement is appropriate given the largely independent nature of disengagement and affect demonstrated in Chapter 7. Moreover, the findings of Chapter 4 show that disengagement is also independent from other behavioural domains. In fact, there is a large extant literature that focuses exclusively on the relation between school-aged children's attentional control (i.e., disengagement) and their social adaptation (e.g., Cortez & Bugental, 1994; Eisenberg, Fabes, Guthrie, et al., 1996; Eisenberg, Fabes, et al., 2000; Gurthrie, et al., 1997; Raver, et al., 1999). In the current chapter, therefore, only disengagement is examined with respect to social adaptation, both concurrently and longitudinally.

The current chapter aims to extend the findings presented in Chapter 7 by examining concurrent and longitudinal relations between children's disengagement to challenging vignettes at both Time 1 and Time 2 and their social adaptation, as rated by both teachers and peers. While the extant research reviewed in Chapters 1 and 2 has demonstrated that well-regulated children tend to be socially competent and children with poor emotion regulation tend to have social difficulties and problem behaviours (e.g., Cole, et al., 1996; Eisenberg, et al., 1993; Eisenberg, Fabes, Guthrie, et al., 1996; Eisenberg, Fabes, Murphy, et al., 1995; Eisenberg, Fabes, &

Murphy, 1995; Eisenberg, Guthrie, et al., 2000; Fabes, et al., 1999; McDowell, et al., 2000; Walcott & Landau, 2004), few studies have investigated longitudinal relation between observed disengagement to challenging vignettes and social adaptation. Thus, in the current study, the relation between children's disengagement and social adaptation across time will be explored.

In Chapter 4, and to a lesser extent in Chapter 3, it was shown that children's disengagement was significantly related to their concurrent social adaptation. In Chapter 6, it was found that disengagement to challenging events made an independent contribution to concurrent social adaptation over and above the relation between social adaptation and children's understanding of mind and emotion. Specifically, children observed to disengage less from the emotional vignettes were more socially competent and had lower levels of problem behaviours. The concurrent relations between children's disengagement and social adaptation has also been demonstrated in the literature. For example, Eisenberg and colleagues (1996) and Cortez and Bugenthal (1994) found that children's use of disengagement during an emotionally evocative video was related to their concurrent problem behaviours and social competencies. In the current study, the nature of the relation between children's responses to challenging vignettes and social adaptation will be evaluated using different measures of social competence, including teacher rated social skills, social maturity, problem behaviours and peer rated social preference. Including various measures of teacher and peer rated social adaptation will allow a comparison of the relation between disengagement and different aspects of children's social adaptation.

In addition to an analyses of the concurrent association between children's observed responses to challenging vignettes and their social adaptation, the current analyses also explore the predictive relation between children's disengagement at Time 1 and their social adaptation at Time 2. When compared to the literature on concurrent relations between behavioural responses and social adaptation, there is substantially less research examining the longitudinal relation between these constructs. An exception is the work by Gilliom et al. (2002) examining disengagement during a frustration task in toddlerhood and social adaptation at six

years of age. They found that earlier reliance on attention-shifting strategies (i.e., disengagement) predicted lower levels of externalising problems and greater social skills. However, earlier levels of social conduct were not controlled for in these analyses. Significant association between earlier disengagement and later social adaptation has also been found using parent and teacher ratings of children's disengagement and attentional control. For example, Eisenberg and colleagues (1995) found that greater teacher-rated attentional control during kindergarten corresponded to greater social skills and prosocial behaviours as rated by teachers at seven years of age, although there was no significant association between attentional control and problem behaviours as rated by parents. While there is a small literature demonstrating a modest concurrent relation between parent/teacher ratings of attentional control and behavioural measures of children's disengagement (e.g., Gurthrie, et al., 1997), caution should be taken when attempting to generalise the findings from studies using parent/teacher rated attentional control to those using observed measures of disengagement. As outlined in Chapter 2, questionnaire measures of attentional control focus on shifting and focusing attention during both emotional and non-emotional events. In contrast, behavioural measures of disengagement are typically concerned with the child's immediate behavioural response to an emotional event. The distinction between disengagement during emotional and non-emotion events is particularly pertinent given the findings presented in Chapters 3 and 4, where disengagement during a non-emotional event, although related to children's use of disengagement during emotional events, was less robustly related to social outcomes.

Many of the studies outlined above have examined one or two aspects of social adaptation in relation to children's behavioural responses to emotional events. The current chapter, like Chapter 6, examines multiple measures of social adaptation; teacher rated social skills, social maturity and problem behaviours, and peer rated social preference. These aspects of social functioning were chosen to represent different domains of social adaptation that have been emphasised as important for children at school entry. Thus, this study is well placed to provide a focused analysis of relations between children's behavioural responding to

emotional events and specific aspects of their social adaptation, both contemporaneously and longitudinally.

Another feature of the current study is that children's disengagement and measures of social competence are assessed at both Time 1 and Time 2. As such, the longitudinal stability in both constructs can be controlled when examining the concurrent and longitudinal relation between children's responses to a challenging vignettes and their social adaptation. This allows an analysis of the unique influence of earlier behavioural or affective responding on later social adaptation.

### **Summary**

This chapter aims to examine the concurrent and longitudinal relation between disengagement and children's social adaptation as measured by both teachers and peers. The findings of Chapters 4 and 6 have already shown that children's use of disengagement during the emotionally evocative vignettes is negatively related to their concurrent social skills, social maturity and social preference, and positively related to problem behaviours. It is expected that these relations will also be demonstrated at Time 2. Although the findings of Gilliom et al. (2002) suggest that earlier disengagement is associated with children's later social adaptation, it is unclear whether this association will be maintained when both the longitudinal stability in disengagement and social adaptation is controlled.

## **8.2 Method**

### **8.2.1 Participants**

Participants were the same as those outlined in Chapters 4 and 7. However, the total number of children with teacher and peer-reported social adaptation was 106 (52 girls), as social adaptation measures were obtained for the three children absent from school on the days that the Emotion Elicitation Paradigm was administered.

### **8.2.2 Procedures**

Children participated in the emotion elicitation paradigm at Time 1 and Time 2 as outlined in Chapters 4 and 7. Social adaptation at Time 1 was assessed via teacher and peer report (outlined in Chapter 4 and 6) and these assessments were

administered again at Time 2, approximately one year later ( $M_{\text{age}} = 80$  months,  $SD = 4.8$  months). Children were administered the sociometric interview in a quiet room at school, and social preference was derived from children's like-most and like-least nominations from the sociometric interview (Coie, et al., 1982). Children's classroom teachers completed the social skills, social maturity and problem behaviour questionnaires. Different teachers filled out these questionnaires at Time 1 and Time 2. Total scores were calculated for social maturity, social skills and problem behaviours.

### 8.3 Results

Descriptive statistics on the four measures of social adaptation are presented first. Then, using structural equation modelling, the relation between disengagement is examined with respect to; (i) social maturity, (ii) social skills, (iii) problem behaviours, and (iv) social preference.

#### 8.3.1 Descriptive statistics

The descriptive statistics for social maturity, social skills, problem behaviour and social preference at Time 1 and Time 2 are shown in Table 8.1 (descriptive statistics for disengagement are presented in Chapter 7, Table 7.1). Social maturity, social skills and social preference at both time-points were normally distributed. However, inspection of the distribution of problem behaviours at both Time 1 and Time 2 showed a positive skew. A skewed distribution is expected in a sample of typical children with relatively few problem behaviours. In order to determine the number of children in the sample that had a greater than average number of problem behaviours, the raw problem behaviour total score was standardised according to the guidelines set out by Gresham and Elliott (1990). Twenty-four children at Time 1 and 23 children at Time 2 were classified as having a greater than average number of problem behaviours (more than 1  $SD$  above the standardised mean), while the remaining children in the sample had an average or fewer than average score for problem behaviours. Only eight children classified as having average or less than average problem behaviours at Time 1 were subsequently classified as having greater than average problem behaviours at Time 2. The

relatively low proportion of children exhibiting problem behaviours at either time point, and the relatively small proportion of children increasing in their problem behaviour classification from Time 1 to Time 2 may pose a problem for the interpretation of the analytic models exploring the relation between behavioural responding and problem behaviour, as such these models are examined cautiously.

Table 8.1  
Number, mean, standard deviations, range for Social Adaptation measures at Time 1 and Time 2

|                                | <i>N</i> | <i>Mean</i> | <i>SD</i> | <i>Range</i> |
|--------------------------------|----------|-------------|-----------|--------------|
| Time 1                         |          |             |           |              |
| Social maturity                | 111      | 29.32       | 9.01      | 8 – 49       |
| Social skills                  | 111      | 42.03       | 12.13     | 14 – 60      |
| Problem behaviours             | 111      | 10.74       | 7.34      | 0 – 35       |
| Social preference <sup>a</sup> | 114      | .00         | 1.67      | -4.42 – 3.34 |
| Time 2                         |          |             |           |              |
| Social maturity                | 106      | 29.13       | 8.01      | 7 – 49       |
| Social skills                  | 106      | 41.81       | 12.96     | 12 – 60      |
| Problem behaviours             | 106      | 9.05        | 7.73      | 0 – 28       |
| Social preference <sup>a</sup> | 106      | .00         | 1.66      | -4.55 – 4.33 |

<sup>a</sup> reflects a standardised score

To examine bivariate concurrent and longitudinal relations between measures of social adaptation and children's behavioural responding, a total disengagement score comprising an aggregate duration of disengagement across the four vignettes (as outlined in Chapter 6) were used at each time-point.

There were robust significant concurrent correlations at Time 1 between children's use of disengagement and social adaptation, such that those children with greater disengagement had poorer social skills,  $r = -.33, p < 0.01$ , and social maturity,  $r = -.35, p < 0.01$ , lower social preference scores,  $r = -.44, p < 0.01$ , and higher levels of problem behaviours,  $r = .21, p < 0.05$ . Table 8.2 shows the relation between disengagement at both Time 1 and Time 2, and social adaptation at Time 2. While there were few concurrent relations between disengagement and social adaptation at Time 2, there were robust longitudinal relations between disengagement at Time

1 and later social adaptation. Children with greater disengagement at Time 1 were more likely to have lower social maturity, social skills and social preference and greater problem behaviours at Time 2.

Table 8.2

Bivariate correlations for children's disengagement at Time 1 and Time 2, and measures of social adaptation at Time 2

|                  | Time 2          |               |                    |                   |
|------------------|-----------------|---------------|--------------------|-------------------|
|                  | Social maturity | Social skills | Problem behaviours | Social preference |
| T1 Disengagement | -.30**          | -.31**        | .37**              | -.28**            |
| T2 Disengagement | -.25*           | -.16          | .08                | -.11              |

\* $p < 0.05$ ., \*\*  $p < 0.01$ .

The latent structure of the social skills and problem behaviour scales of the SSRS have already been subject to factor analyses (Gresham & Elliott, 1990), as such, total scores were used in the subsequent analyses. However, as data from the social maturity questionnaire has not been widely used, a confirmatory factor analyses was first used to verify that the latent factor structure of social maturity could be constructed prior to testing a model including disengagement (see Appendix D). As social preference only comprised a single score, longitudinal stability was examined via bivariate correlation and suggested that there was robust longitudinal stability in children's social preference,  $r = .72$ ,  $p < 0.01$ .

### 8.3.2 Social maturity and behavioural responding

The social maturity latent variable score (see Appendix D) and the disengagement latent factor (see Chapter 7, Section 7.4.2) across Time 1 and Time 2 were included in the model. Latent variable scores were used for the social maturity measure rather than the social maturity CFA in the subsequent models in order to avoid inflating the degrees of freedom. As latent variable scores are adjusted for measurement error, they were used in place of the total score on the social maturity scale.

As shown in Figure 8.1, a model was specified in which the disengagement latent factors at Time 1 and Time 2 were modelled with social maturity latent scores

at both time-points as covariates. Specifically, this model was constructed to examine the concurrent relation between social maturity and disengagement at each time-point, as well as the predictive relation between disengagement at Time 1 and social maturity at Time 2.

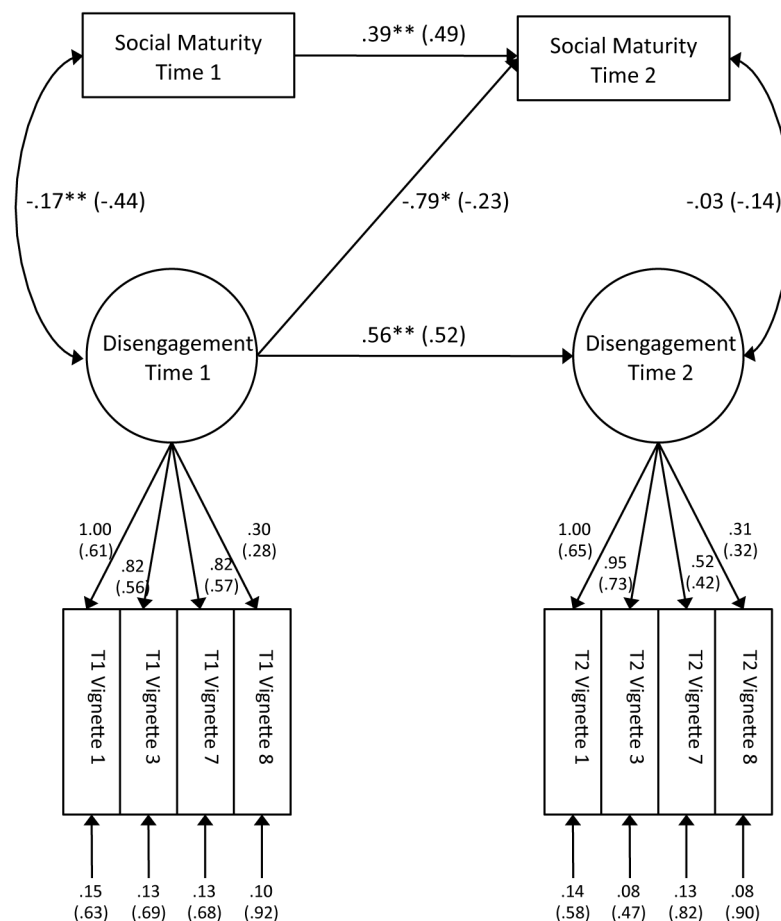


Figure 8.1. Unstandardised and completely standardised parameter estimates modelling disengagement as a latent factor and social maturity at Time 1 and Time 2. Completely standardised parameter estimates are presented in parentheses, \* $p < 0.05$ , \*\* $p < 0.01$ .

The model was over-identified with 32  $df$  and  $\chi^2 = 47.53$ ,  $p = 0.04$ . The remaining overall goodness-of-fit indices suggest largely an adequate model fit: SRMR = 0.07, RMSEA = 0.07, CFI = 0.91 and TLI = 0.87. There was significant longitudinal stability in both disengagement and social maturity. In addition, there was a significant cross-lagged relation between disengagement at Time 1 and social maturity at Time 2, such that those children at Time 1 with a level of disengagement 1  $SD$  above the mean were predicted to have a social maturity level .22  $SDs$  lower

than the mean at Time 2, controlling for both Time 1 social maturity and Time 2 disengagement. Finally, there was a significant concurrent correlation between disengagement and social maturity at Time 1, such that children showing greater disengagement had lower social maturity. There was no significant concurrent relation between disengagement and social maturity at Time 2.

To test if the relation between disengagement and social maturity found at Time 1 was significantly different to the non-significant relation between disengagement and social maturity at Time 2, these parameter estimates were constrained to equality. The constrained model,  $\chi^2 = 52.98$ ,  $df = 33$ ,  $p < 0.05$ , led to a significant reduction in model fit,  $\chi^2_{diff} = 5.47$ ,  $\Delta df = 1$ ,  $p < 0.05$ , suggesting that there is a significant difference in the relation between disengagement and social maturity at Time 1 compared to Time 2.

### **8.3.3 Social skills and behavioural responding**

Social skills comprised a total score for the three social skills subscales of the SSRS. As shown in Figure 8.2, a model was specified in which the disengagement latent factors at Time 1 and Time 2 were modelled with social skills scores at both time-points as covariates. Specifically, this model examined the concurrent relation between social skills and disengagement at each time-point, as well the predictive relation between disengagement at Time 1 and social skills at Time 2. The model was over-identified with 32  $df$  and  $\chi^2 = 46.00$ ,  $p > 0.05$ . The overall goodness-of-fit indices suggested largely a good model fit: SRMR = 0.07, RMSEA = 0.06, CFI = 0.90 and TLI = 0.86. There was significant longitudinal stability in both disengagement and social skills. However, unlike the findings for social maturity, there was no significant cross-lagged relation between disengagement at Time 1 and social skills at Time 2. There was a significant concurrent relation between disengagement and social skills at Time 1, with children showing greater disengagement scoring lower on social skills. There was no such significant concurrent relation between disengagement and social skills at Time 2.

To test if the relation between disengagement and social skills found at Time 1 was different to the non-significant relation between disengagement and social skills at Time 2 these parameter estimates were constrained to equality. The

constrained model,  $\chi^2 = 49.88$ ,  $df = 33$ ,  $p = 0.03$ , led to a significant reduction in model fit,  $\chi^2_{diff} = 3.88$ ,  $\Delta df = 1$ ,  $p < 0.05$ , suggesting that there is a significant difference in the relation between disengagement and social skills at Time 1 compared to Time 2.

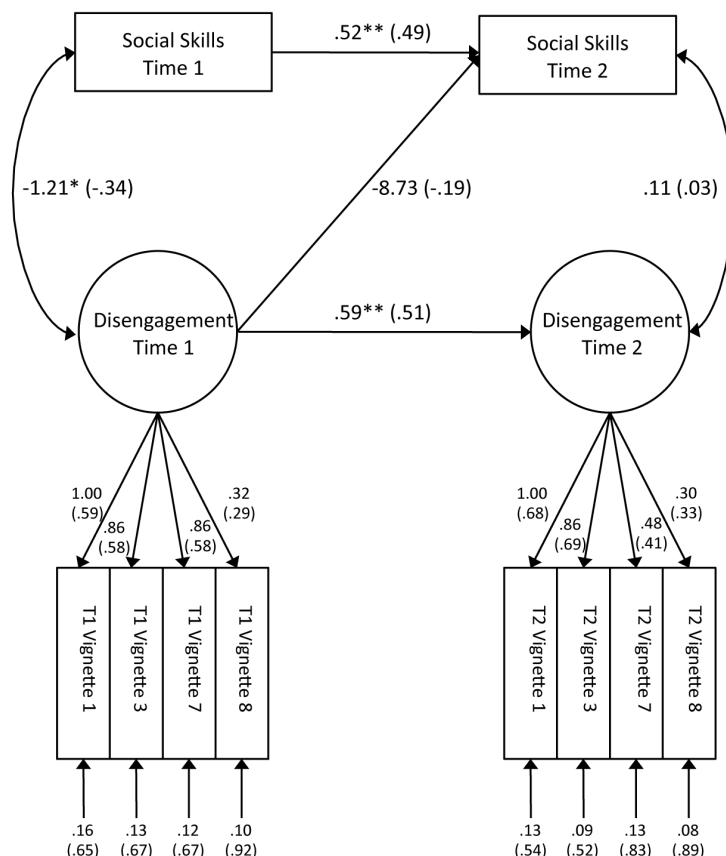


Figure 8.2. Unstandardised and completely standardised parameter estimates modelling disengagement as a latent factor and social skills at Time 1 and Time 2. Completely standardised parameter estimates are presented in parentheses, \* $p < 0.05$ , \*\*  $p < 0.01$ .

### 8.3.4 Problem behaviour and behavioural responding

Problem behaviours comprised a total score for the three problem behaviour subscales of the SSRS. However, given the nature of the problem behaviour variable as outlined in Section 8.3.1, a more cautious approach was taken in modelling the relation between children’s disengagement and problem behaviours.

Prior to examining a full model including both the longitudinal stability of disengagement and problem behaviours, an initial model was constructed examining the relation between disengagement at both time-points and children’s problem

behaviours at Time 2 only. Time 1 problem behaviours was not included in this initial model as not many children changed in their degree of problem behaviours over time and, as a result, controlling for initial problem behaviours would result in a loss of variability in the problem behaviour variable at Time 2. The initial model was over-identified with 25 *df* and  $\chi^2 = 32.52$ ,  $p > 0.05$ . The remaining overall goodness-of-fit indices suggested largely a good to adequate model fit: SRMR = 0.07, RMSEA = 0.05, CFI = 0.93 and TLI = 0.90. There was no concurrent relation between Time 2 problem behaviours and disengagement. There was, however, a significant cross-lagged relation between disengagement at Time 1 and problem behaviours at Time 2, such that those children at Time 1 with a level of disengagement 1 SD above the mean were predicted to have a level of problem behaviours .39 SDs higher than the mean at Time 2, controlling for the longitudinal stability in disengagement.

Given this finding, a final model was constructed including the longitudinal stability in problem behaviours. That is, a model was specified in which the disengagement latent factors at Time 1 and Time 2 were modelled with problem behaviour scores at both time-points as covariates (see Figure 8.3). Specifically, this model examined the concurrent relation between problem behaviours and disengagement at each time-point, as well the predictive relation between disengagement at Time 1 and problem behaviours at Time 2.

The model was over-identified with 32 *df* and  $\chi^2 = 47.18$ ,  $p = 0.04$ . The remaining overall goodness-of-fit indices suggested largely an adequate model fit: SRMR = 0.07, RMSEA = 0.07, CFI = 0.91 and TLI = 0.88. The significant cross-lagged relation between disengagement at Time 1 and problem behaviours at Time 2 found in the initial model remained, such that those children at Time 1 with a level of disengagement 1 SD above the mean were predicted to have a level of problem behaviours .31 SDs higher than the mean at Time 2, controlling for the significant longitudinal stability found in both disengagement and problem behaviours. When controlling for the longitudinal stability in both disengagement and problem behaviours there was no concurrent relation between disengagement and problem behaviours at either Time 1 or Time 2.

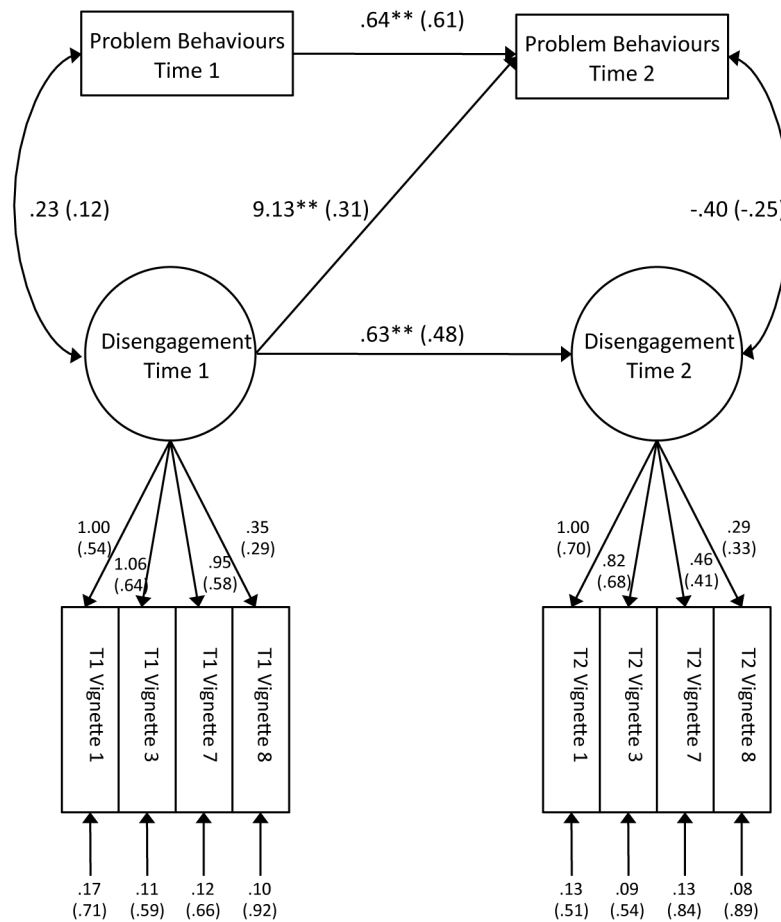


Figure 8.3. Unstandardised and completely standardised parameter estimates modelling disengagement as a latent factor and problem behaviours at Time 1 and Time 2. Completely standardised parameter estimates are presented in parentheses, \* $p < 0.05$ , \*\*  $p < 0.01$

### 8.3.5 Social preference and behavioural responding

Social preference was calculated based on children’s like-most and like-least nominations by their peers, and is outlined by Coie et al. (1982, see also Chapter 6). As shown in Figure 8.4, a model was specified in which the disengagement latent factors at Time 1 and Time 2 were modelled with social preference scores at both time-points as covariates. Specifically, this model examined the concurrent relation between social preference and disengagement at each time-point, as well the predictive relation between disengagement at Time 1 and social preference at Time 2. The model was over-identified with 32  $df$  and  $\chi^2 = 45.42$ ,  $p > 0.05$ . The overall goodness-of-fit indices suggested largely a good to adequate model fit: SRMR = 0.07, RMSEA = 0.06, CFI = 0.93 and TLI = 0.90. There was significant longitudinal stability in both disengagement and social preference and a significant concurrent relation

between disengagement and social preference at Time 1, with children showing greater disengagement scoring lower on social preference. However, there was no significant concurrent relation between disengagement and social skills at Time 2, nor was there a significant cross-lagged relation between disengagement at Time 1 and social preference at Time 2.

To test if the relation between disengagement and social preference found at Time 1 was significantly different to the non-significant relation between disengagement and social preference at Time 2 these parameter estimates were constrained to equality. The constrained model,  $\chi^2 = 56.98$ ,  $df = 33$ ,  $p = 0.01$ , led to a significant reduction in model fit,  $\chi^2_{diff} = 11.56$ ,  $\Delta df = 1$ ,  $p < 0.05$ , suggesting that there is a significant difference in the relation between disengagement and social preference at Time 1 compared to Time 2.

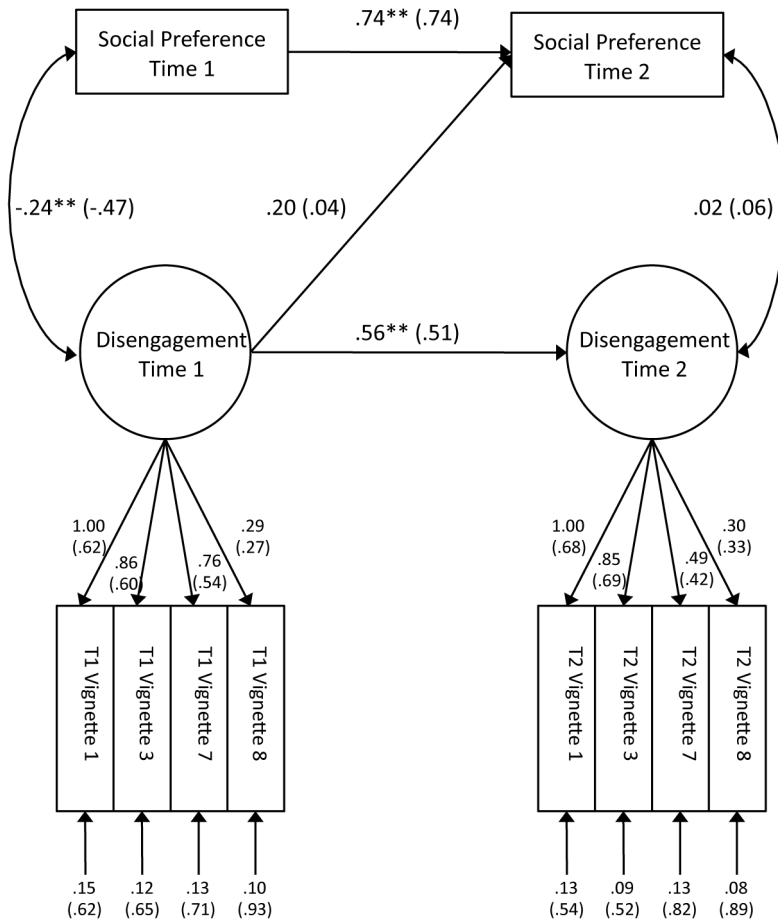


Figure 8.4. Unstandardised and completely standardised parameter estimates modelling disengagement as a latent factor and social preference at Time 1 and Time 2. Completely standardised parameter estimates are presented in parentheses, \* $p < 0.05$ , \*\*  $p < 0.01$ .

### 8.4 Discussion

This chapter examined the concurrent and longitudinal relations between children’s disengagement and social adaptation during the first two years of formal schooling. A unique feature of the current set of analyses was the use of multiple measures of social adaptation in order to examine specific relations between disengagement and different aspects of social competence. Furthermore, the current analyses allowed for the predictive relation between children’s earlier disengagement and later social adaptation to be ascertained controlling for the longitudinal stability in both constructs.

First, the current findings clearly demonstrate the robust longitudinal stability in children’s social maturity, social skills, problem behaviours and peer rated social preference. In addition to the longitudinal stability in different measures of social

adaptation there were also associations, both concurrent and longitudinal, between specific measures of social adaptation and children's disengagement. However, one common feature across all measures of social adaptation was the lack of significant concurrent relations between disengagement and social adaptation at Time 2. A similar absence of relations between behavioural measures at Time 2 was also outlined in Chapter 7.

The lack of relations between disengagement and social adaptation may be because the emotion eliciting vignettes come to mean different things to older children. As outlined in Chapter 7, although the emotional vignettes may have been particularly salient for younger children, by the second year of school, older children may be more familiar with the themes depicted by the vignettes. This is relevant because, as shown in Chapter 3 and 4 (see also Cortez & Bugental, 1994), although children were still observed to disengage from less emotionally challenging vignettes this disengagement was *unrelated* to social adaptation. Thus, the vignettes at Time 2, although eliciting an equivalent amount of disengagement as at Time 1, may have no longer be sufficiently challenging for children. As such, the degree to which children disengaged from these vignettes at Time 2 was unrelated to social adaptation. This finding stresses the importance of the situational context for interpreting the meaning of children's observed behavioural responses and suggests that perhaps more salient emotional vignettes should be used with older children in order to elicit meaningful regulatory responses.

Despite a lack of relations between disengagement and social adaptation at Time 2, there were several notable predictive relations between children's responses to the challenging vignettes at Time 1 and their social adaptation at Time 2. Disengagement had both a concurrent and cross-lagged association with measures of social adaptation. As expected from the findings presented in Chapters 4 and 6, disengagement was concurrently related to children's teacher rated social maturity and social skills, and peer rated social preference at Time 1. However, in addition to a concurrent relation, there was also a longitudinal association between disengagement and measures of social adaptation. Specifically, the degree to which children disengaged from the emotional vignettes at Time 1 was related to their

level of social maturity and problem behaviours as rated by teachers one year later. Greater disengagement at Time 1 predicted lower levels of social maturity and greater problem behaviours at Time 2, over and above the stability in children's disengagement and social adaptation. As the problem behaviour measure comprised items assessing externalising, internalising and hyperactivity behaviours it is difficult to interpret the meaning of the predictive relation between disengagement and problem behaviours. Broadly, however, it appears that children more likely to disengage from a series of emotionally evocative events were also more likely to behave in disruptive ways in the classroom and engage in maladaptive relations with peers.

Somewhat surprisingly, however, while there was a predictive relation between children's disengagement and teacher-rated social maturity there was no cross-lagged relation with teacher-rated social skills at Time 2. Although social skills and social maturity measures were robustly correlated (see Chapter 6), the distinctive pattern of associations between disengagement and social maturity compared to social skills may be due to a notable differences between these two teacher rated measures of social adaptation. First, the social skills measures comprises an assessment of children's assertion, cooperation and prosocial behaviours in the broad classroom context, whereas the social maturity scale is an age-referenced, comparative assessment of children's specific social behaviours with peers. The current findings suggest that at school-entry (Time 1) children's regulatory behaviours are related to their broad social skills in the classroom as well as their specific social maturity with their peers. However, these regulatory behaviours appear to have a predictive relation only to children's later maturity with peers not to their general social skills in a classroom context. Thus it appears that, by children's second year of formal schooling, classroom conduct is no longer contingent on earlier regulatory skills whereas these earlier skills still impact on the maintenance of positive and mature peer relationships.

Turning to children's peer rated social preference, this measure of social adaptation was only related to disengagement concurrently at Time 1 (as shown in Chapter 6). There was no longitudinal impact of disengagement at Time 1 on later

social preference, nor was there a concurrent relation between disengagement and social preference at Time 2. Social preference is a very different measure of a child's social adaptation compared to teacher rated social skills or social maturity. While the teacher rated measures assess children's social behaviours with a series of different items, a child's social preference score is the combined ratings from multiple children in the child's classroom on one specific social item, their like or dislike of the target child. Social preference did have remarkable stability across time-points and children's social preference at Time 1 was the strongest predictor of children's social preference one year later. The substantial stability in children's social preference across time found in the current analyses is supported in the literature (Bukowski & Newcomb, 1984; Cillessen & Mayeux, 2004; Denham, et al., 1990). This current finding suggest the children's stable peer reputations are established early in peer interactions, and are not responsive to potential changes in emotional competences. This finding is similar to that reported by Eisenberg and colleagues (1995), who failed to find a systematic relation between behavioural responding and peer rated measures of social adaptation. Although, Eisenberg et al. (1995) suggests that children's appreciation of their peers' emotional and social competencies may increase with age, such that perhaps older children may include a broader range of skills when evaluating their peer's social acceptability (Eisenberg & Fabes, 1995).

Overall, the current analyses suggest that children's abilities to engage and disengage attention from challenging events is related to social outcomes, especially at Kindergarten. There is one important limitation to the current analyses. Despite the breadth of social adaptation measures included in this study, there are several aspects of children's social behaviour that are not assessed, such as angry and aggressive behaviours or observational measures of children's social interactions with peers, and these direct measures of children's social adaptation may emerge as closely related to children's observed behavioural responses to emotional events, both concurrently and longitudinally.

The final empirical chapter in this thesis expands upon the findings presented in the Chapter 6, 7 and 8 by examining the longitudinal relation between children's emotional competencies, including behavioural and affective responses to emotion

eliciting events and their understanding of mind and emotion, and measures of social adaptation.

## Chapter Nine

### The Longitudinal Relation Between Emotion Regulation, Emotion Understanding and Social Adaptation

#### 9.1 Introduction and aims

The current chapter aims to extend the findings presented in Chapters 6 and 8 by examining the longitudinal relation between children's emotional competence at Kindergarten (comprising of emotion regulation, empathy and emotion understanding, Saarni, 1999), and social adaptation one year later. This chapter, therefore, explores the relation between behavioural and affective responses at Time 1, and children's social adaptation at Time 2, while simultaneously examining children's understanding of mind and emotion. In Chapter 6, it was shown that, in addition to children's behavioural responses to emotionally challenging events, their understanding of mind and emotion also made an independent contribution to social adaptation. In Chapter 8 it was shown that, although there were no concurrent relations between children's disengagement and their social adaptation at Time 2, children's disengagement at Time 1 made a significant contribution to social adaptation one year later. Thus, the results of Chapter 6 and 8 suggest that children's earlier behavioural responses have an impact on later social adaptation. The current chapter aims to examine the longitudinal influence of children's experience of emotion, comprising both disengagement and affect, on social adaptation, while simultaneously examining children's understanding of mind and emotion.

As outlined in Chapters 1 and 6, children's emotional competence encompasses a wide range of emotionally relevant skills, all of which have been emphasised as important for children's adaptive social functioning (e.g., Denham, 1998; Denham, et al., 2003; Halberstadt, et al., 2001; Saarni, 1999). The extant empirical literature, however, typically focuses on either children's experience of emotion, including emotion regulation and affective expressions or focus is placed on children's understanding of mind and emotion (de Rosnay, et al., 2008; Harris, 1994). Chapter 6 explored the impact of both children's experience of emotion and

their understanding of emotion as potential predictors of concurrent social adaptation. In particular, special attention was given to the differential impact of various aspects of children's understanding of mind and emotion –theory-of-mind understanding (ToM), emotion understanding (EU) and empathic role-taking– on social adaptation. In Chapter 6, ToM and EU were examined independently but were also combined to create a global index of children's *psychological perspective taking* (PPT). The same approach is adopted in the current chapter; this is especially important given uncertainty in the literature regarding the longitudinal impact of ToM and EU on children's social adaptation (de Rosnay, et al., 2008). Finally, in light of the combined influence of PPT and disengagement on problem behaviours outlined in Chapter 6, the interactive impact of emotion regulation and understanding of mind and emotion on children's later social adaptation will be also investigated.

The findings presented in Chapter 6 demonstrated that children's behavioural and affective responses, in addition to their understanding of mind and emotion, were independently associated with social adaptation in Kindergarten. Generally, those children who disengaged less, expressed sadness rather than worry-concern, and were better able to take the perspective of others, were more likely to be socially competent (as rated by both teachers and peers). Furthermore, these relations were independent of children's expressive and receptive verbal abilities. Only children's disengagement and affective responses were directly related to teacher-rated problem behaviours, but PPT moderated the influence of disengagement on problem behaviours, such that poor PPT magnified the negative association between poor emotion regulation and problem behaviours. When examining ToM and EU separately, it was found that both ToM and EU were independently related to children's social competence as rated by teachers. However, only ToM understanding was related to children's peer rated social preference.

The extant literature provides some evidence that children's earlier emotional competence has an impact on later social functioning. For example, a study by Denham and colleagues (2003) examined the impact of various domains of

emotional competence on children's concurrent social competence at preschool, as well as one year later, when children were in Kindergarten. They found that emotion understanding and emotion regulation made independent contributions to the prediction of children's social competence as rated by teachers and peers, both concurrently and longitudinally. Another study by Schultz et al. (2001) found a longitudinal relation between preschool children's understanding of mind and emotion, indexed by emotion expression knowledge, and social conduct two years later. Importantly, this longitudinal relation was independent from the relation between children's emotion regulation and their social conduct. The findings of Denham et al. (2003) and Schultz et al. (2001) imply that different aspects of children's emotional competence, notably, their emotion regulation and emotion understanding, make an independent longitudinal contribution to social adaptation. Thus, given the findings of Denham et al. and Schultz et al., and the findings presented in Chapter 6, it is expected that both behavioural responses to emotionally challenging events and children's understanding of mind and emotion will make independent contributions to children's social adaptation one year later.

The research outlined above, however, does not speak to the longitudinal impact of children's empathy on later social adaptation. Thus, the longitudinal impact of children's empathy on social adaptation is examined in the current study. In addition to typical measures of children's emotion regulation (i.e., disengagement), the current study also explores children's affective responses to an empathy inducing event as a predictor of social adaptation; that is, children's expressions of worry-concern and sadness are examined in relation to behavioural outcomes. Furthermore, in addition to traditional measures of children's understanding of mind and emotion (ToM and EU), the current study also includes children's empathic role-taking as an index of the proclivity to take on the emotional perspective of someone in distress, as discussed in Chapter 6. The empirical literature suggests that these measures of empathy are related to social adaptation both concurrently and longitudinally (e.g., Eisenberg, 2000b; Eisenberg & Fabes, 1995; Hastings, et al., 2000; Roberts & Strayer, 1996; Strayer, 1989; Underwood & Moore, 1982). Furthermore, in Chapter 6, the independent influence of both

affective empathy and empathic role-taking on children's social adaptation was demonstrated, over and above other measures of emotional competence. Children expressing sadness as opposed to worry-concern, and those with greater empathic role-taking proclivities, were more likely to be rated by their teachers as socially competent. Children's expressions of sadness were also negatively related to teacher ratings of problem behaviours. Children's empathic role-taking was unrelated to either teacher-rated problem behaviours or their peer-rated social preference. The current study examines whether children's affective empathy and empathic role-taking make an independent longitudinal contribution to children's social competence, controlling for other aspects of emotional competence; namely disengagement, theory of mind and emotion understanding.

As outlined in previous chapters, multiple methods of assessing children's social adaptation are employed. By including different aspects of children's social competencies and problem behaviours, as rated by both teachers and peers, the current analyses will provide an insight into the specific relations between children's emotional competence and different aspects of their social adaptation. Furthermore, due to the robust longitudinal stability in children's social adaptation documented in Chapter 8, children's social adaptation at Time 1 will be controlled in all analyses. By controlling for the longitudinal stability in social adaptation, the current analyses will enable the longitudinal impact of earlier emotional competence on later social adaptation to be inferred over and above the stability of social adaptation measures.

### ***Summary***

The analyses presented in the current chapter specifically investigate the influence of emotion regulation, empathy and emotion understanding at Time 1 on children's social adaptation at Time 2. Concurrent relations between children's emotional competence and social adaptation at Time 2 are not examined. As a result, the current chapter focuses exclusively on the impact of children's earlier responses to challenging events to their later social adaptation, while simultaneously examining children's understanding of mind and emotion at Time 1. In this way, it is possible, with some degree of rigour, to determine plausible causal influences of emotional competence (emotion regulation, affective empathy, PPT and empathic

role-taking) on children's social competence. There are two important features of the current analyses, first, the inclusion of multiple domains of emotional competence allows for the examination of their independent and combined influences on later social adaptation. Second, the longitudinal stability in children's social adaptation is controlled, allowing the unique contribution of children's earlier emotional competence on later social adaptation to be ascertained.

### **9.2 Method**

#### **9.2.1 Participants**

Participants were the same as those outlined in Chapters 4 and 7. As some children were away from school when certain tasks were administered the degrees of freedom differ slightly across different analyses.

#### **9.2.2 Measures**

Observational measures of children's disengagement and affective responses to challenging vignettes are outlined in Chapter 4. Measures of verbal ability, theory of mind (ToM), emotion understanding (EU) and empathic role-taking are outlined in Chapters 6. Social adaptation measures at Time 1 are outlined in Chapters 4 and 6. Time 2 social adaptation measures are outlined in Chapter 8. It should be emphasised that different teachers rated children's social adaptation at Time 1 and Time 2.

#### **9.2.3 Procedures**

Procedures at Time 1 are identical to those presented in Chapters 4 and 6. Procedures for the collection of children's social adaptation measures at Time 2 are outlined in Chapter 8.

### **9.3 Results**

First, bivariate relations among measures of emotional competence at Time 1 and social adaptation at Time 2 are examined. Second, the contribution of emotional competence variables at Time 1 to the prediction of children's social adaptation at Time 2 is examined via hierarchical regression models. Descriptive statistics for Time 1 variables are outlined in Chapter 6 (Table 6.1). Descriptive statistics for children's social adaptation at Time 2 are outlined in Chapter 8 (Table 8.1).

### 9.3.1 Bivariate Relations

Table 9.1 summarises the pattern of bivariate relations between background variables (sex, age and verbal ability), emotional competence at Time 1 (disengagement, ToM, EU and empathic role-taking and), and children's social adaptation at Time 2 (teacher rated social maturity, social skills and problem behaviours, and peer rated social preference). Sex was related to all teacher rated social adaptation measures, whereas age was unrelated to any social adaptation measures. This finding should be contrasted with those presented in Chapter 6 where sex was unrelated to any social adaptation measure at Time 1. Verbal ability was related to teacher rated social maturity. Given these relations, in subsequent analyses verbal ability and sex will be included as control variables.

Table 9.1  
Bivariate relations between T1 emotional competence variables and measures of T2 social competence

|        |                      | Time 2          |               |                    |                   |
|--------|----------------------|-----------------|---------------|--------------------|-------------------|
|        |                      | Teacher-rated   |               |                    | Peer-rated        |
|        |                      | Social maturity | Social skills | Problem behaviours | Social preference |
| Time 1 | Sex                  | .36**           | .23*          | -.20*              | .06               |
|        | Age                  | .18             | -.04          | .08                | .07               |
|        | Verbal ability       | .20*            | .05           | .06                | .17               |
|        | PPT                  | .32**           | .14           | -.05               | .35**             |
|        | ToM                  | .26**           | .15           | -.05               | .33**             |
|        | EU (tec11)           | .30**           | .11           | -.05               | .27**             |
|        | Empathic role-taking | .09             | .17           | -.03               | .13               |
|        | Disengagement        | -.30**          | -.31**        | .37**              | -.28**            |

\* $p < 0.05$ , \*\* $p < 0.01$ .

While Time 2 teacher-rated social skills and social maturity were robustly correlated,  $r = .69$ , they showed a different pattern of relations with children's Time 1 emotional competence measures. Disengagement was significantly negatively related to both social skills and social maturity at Time 2, whereas ToM and EU were only positively correlated with social maturity at Time 2. Disengagement was

positively correlated with problem behaviours at Time 2. Finally, disengagement was negatively correlated with peer rated social preference, and ToM and EU were positively related to social preference.

There were considerably fewer relations between children's affective responses and social adaptation measures. In Table 9.2 it can be seen that children expressing sadness had fewer teacher rated problem behaviours compared to children expressing worry-concern, although this relation was marginally significant. Affective responses were unrelated to social maturity, social skills and social preference. Finally, empathic role-taking was unrelated to any measures of social adaptation.

Table 9.2

Means (*SD*) of study variables by affective empathy group, ANOVA *F* value and significant contrasts using children expressing sadness as the reference category (*n* = 105)

|        |                                | Time 1 Affect Group              |                                   |                         | F-value | Contrasts |
|--------|--------------------------------|----------------------------------|-----------------------------------|-------------------------|---------|-----------|
|        |                                | Inexpressive<br>( <i>n</i> = 41) | Worry-concern<br>( <i>n</i> = 32) | Sad<br>( <i>n</i> = 32) |         |           |
| Time 2 | Social maturity                | 29.00<br>(7.86)                  | 28.50<br>(8.44)                   | 30.00<br>(8.07)         | .27     | –         |
|        | Social skills                  | 42.89<br>(12.16)                 | 39.47<br>(13.35)                  | 43.16<br>(13.65)        | .83     | –         |
|        | Problem behaviours             | 9.23<br>(7.51)                   | 10.94<br>(8.18)                   | 7.19<br>(7.26)          | 1.93    | S < W†    |
|        | Social preference <sup>a</sup> | -.07<br>(1.44)                   | -.04<br>(1.90)                    | .15<br>(1.73)           | .17     | –         |

†  $p < 0.1$ . Note: I = Inexpressive, W = Worry-concern, S = Sad, <sup>a</sup> Social preference reflects a standardised score.

In the following analyses, the simultaneous contribution of various domains of emotional competence to different aspects of children's social adaptation is examined.

### 9.3.2 Emotional competence and social adaptation

To examine the unique contribution of emotional competence variables to the prediction of social adaptation at Time 2, a series of hierarchical multiple regressions were constructed. In each model, the specific contribution of children's

emotional competence at Time 1 on social adaptation at Time 2 was examined after the stability in social adaptation was controlled. The two measures of teacher rated social competence (social skills and social maturity) showed a different pattern of relations to children's Time 1 emotional competence variables, as such, unlike Chapter 6, they are examined separately.

In order to examine the differential impact of ToM and EU, each model will be rerun with either ToM or EU in place of the combined PPT variable. In addition, the interaction between children's disengagement and their PPT will be included on the final step of each model. Finally, empathic role-taking was not included in the regression models as it was unrelated to any social adaptation measure longitudinally.

To examine the influence of children's emotional competence at Time 1 to different aspects of social adaptation at Time 2, four separate regression models were constructed, one each for; (i) social maturity, (ii) social skills, (iii) problem behaviours, and (iv) peer-rated social preference. The stability of these scales was discussed in Chapter 8 and a CFA for social maturity is presented in Appendix D.

### **(i) Social maturity**

In the first model predicting teacher rated social maturity at Time 2, verbal ability, sex and social maturity at Time 1 were entered at the first step. PPT, disengagement and affect group were entered at the second step. Affect group was dummy-coded such that children expressing sadness were the reference category. The model at the first step was significant,  $F(3, 97) = 14.46, p < 0.01$ . Sex and Time 1 social maturity made a significant contribution to the prediction of Time 2 social maturity; controlling for Time 1 social maturity, girls were predicted to have greater social maturity at Time 2 compared to boys.

The overall (2-step) model was also significant,  $F(7, 93) = 7.81, p < 0.01$ , but the addition of the emotional competence variables made only a marginally significant improvement to  $R^2$ ,  $\Delta F(4, 93) = 2.26, p < 0.1$ . Disengagement and affect group had a marginally significant impact on Time 2 social maturity, whereas Time 1 social maturity and sex remained robust predictors of later social maturity. To examine the combined influence of children's disengagement and PPT, an

interaction term was computed using standardised scores (PPT x disengagement) and included on a third step of the overall model. The interaction term was not significant.

To assess whether ToM and EU had a similar impact on teacher rated social maturity, the overall (2-step) model was re-run with either ToM or EU included in place of the composite PPT variables. For ToM, the overall model was relatively unchanged, and ToM,  $\beta = .03$ ,  $t(93) = .03$ , *ns*, did not have a significant impact on the prediction of social maturity at Time 2. When EU was included, however, the overall model was significant,  $F(7, 93) = 8.28$ ,  $p < 0.01$ , and the second step now significantly improved the overall model,  $\Delta F(4, 93) = 2.83$ ,  $p < 0.05$ . Furthermore, EU, disengagement and affect group made significant independent contributions to the prediction of Time 2 social maturity, over and above the significant contribution made by Time 1 social maturity (see Table 9.3). More socially mature children at Time 2 were those who scored more highly on EU and showed less disengagement. Surprisingly, given the findings presented in Chapters 4 and 6, controlling for the other variables in the model children who were inexpressive compared to sad were likely to be more socially mature children at Time 2.

Table 9.3  
Hierarchical multiple regression analyses predicting Time 2 social maturity ( $N = 101$ )

| Variable              | Model 1            |         |              |         |              |         |
|-----------------------|--------------------|---------|--------------|---------|--------------|---------|
|                       | T2 Social maturity |         |              |         |              |         |
|                       | Step 1             |         | Step 2 (PPT) |         | Step 2 (EU)  |         |
|                       | $\Delta R^2$       | $\beta$ | $\Delta R^2$ | $\beta$ | $\Delta R^2$ | $\beta$ |
|                       | .31**              |         | .06          |         | .08*         |         |
| Sex                   |                    | .24**   |              | .26**   |              | .28**   |
| Verbal ability        |                    | .06     |              | -.03    |              | -.04    |
| T1 Social maturity    |                    | .43**   |              | .38     |              | .37**   |
| PPT                   |                    |         |              | .15     |              | –       |
| EU                    |                    | –       |              | –       |              | .20*    |
| Disengagement         |                    | –       |              | -.18    |              | -.19*   |
| Affect: Inexpressive  |                    | –       |              | .19     |              | .20*    |
| Affect: Worry-concern |                    | –       |              | .06     |              | .07     |
| Total $R^2$           |                    |         | .37**        |         | .38**        |         |

\*  $p < 0.05$ ., \*\*  $p < 0.01$ . Note: PPT = psychological perspective taking, EU = emotion understanding

### (ii) Social skills

In the second model, predicting teacher rated social skills at Time 2, the same overall approach was taken (see Table 9.4). Sex, verbal ability and Time 1 social skills were entered on the first step. This first step was significant,  $F(3, 97) = 13.89$ ,  $p < 0.01$ , and Time 1 social skills made an significant contribution to the prediction of Time 2 social skills. The emotional competence variables were entered on the second step. The addition of the emotional competence variables did not improve the overall model,  $\Delta F(4, 93) = 1.30$ , *ns*, Time 1 social skills remained the only significant predictor of Time 2 social skills. To examine the combined influence of children's disengagement and PPT, an interaction term was computed using standardised scores (PPT x disengagement) and included on a third step of the overall model. The interaction term was not significant.

Table 9.4  
Hierarchical multiple regression analyses predicting Time 2 social skills ( $N = 101$ )

| Variable              | Model 2          |         |              |         |
|-----------------------|------------------|---------|--------------|---------|
|                       | T2 Social skills |         |              |         |
|                       | Step 1           |         | Step 2       |         |
|                       | $\Delta R^2$     | $\beta$ | $\Delta R^2$ | $\beta$ |
|                       | .30**            |         | .04          |         |
| Sex                   |                  | .13     |              | .14     |
| Verbal ability        |                  | -.10    |              | -.11    |
| T1 Social skills      |                  | .53**   |              | .48**   |
| PPT                   |                  | –       |              | -.01    |
| Disengagement         |                  | –       |              | -.16    |
| Affect: Inexpressive  |                  | –       |              | .14     |
| Affect: Worry-concern |                  | –       |              | -.01    |
| Total $R^2$           |                  |         | .34**        |         |

\*  $p < 0.05$ ., \*\*  $p < 0.01$ . Note: PPT = Psychological perspective taking

To assess whether ToM and EU has a similar influence on teacher-rated social skills at Time 2, the overall (2-step) model was re-run with either ToM or EU included in place of the composite PPT variables. Both models remained essentially unchanged, neither ToM,  $\beta = -.06$ ,  $t(93) = -.53$  *ns*, nor EU,  $\beta = -.01$ ,  $t(93) = -.06$ , *ns*, had a significant impact on the prediction of social skills one year later.

### **(iii) Problem behaviours**

In the third model, predicting teacher-rated problem behaviours (see Table 9.5), sex, verbal ability, and Time 1 problem behaviours were entered on the first step,  $F(3, 97) = 24.41$ ,  $p < 0.01$ . Only Time 1 problem behaviours was a significant predictor of Time 2 problem behaviours on the first step. On the second step, children's emotional competence variables were entered. The overall (2-step) model was significant,  $F(7, 93) = 13.30$ ,  $p < 0.01$ , and the addition of the emotional competence variables significantly improved the model,  $\Delta F(4, 93) = 3.26$ ,  $p < 0.05$ . In the overall model, both disengagement and Time 1 problem behaviours made a significant contribution to the prediction of Time 2 problem behaviours. In order to examine the combined influence of children's disengagement and PPT, an interaction term was computed using standardised scores (PPT x disengagement)

and included on a third step of the overall model. The interaction term was not significant.

Table 9.5  
Hierarchical multiple regression analyses predicting Time 2 problem behaviours ( $N = 101$ )

| Variable              | Model 3               |         |              |         |
|-----------------------|-----------------------|---------|--------------|---------|
|                       | T2 Problem Behaviours |         |              |         |
|                       | Step 1                |         | Step 2       |         |
|                       | $\Delta R^2$          | $\beta$ | $\Delta R^2$ | $\beta$ |
|                       | .43**                 |         | .07*         |         |
| Sex                   |                       | -.12    |              | -.11    |
| Verbal ability        |                       | .08     |              | .12     |
| T1 Problem Behaviours |                       | .63**   |              | .58**   |
| PPT                   |                       | —       |              | .05     |
| Disengagement         |                       | —       |              | .26**   |
| Affect: Inexpressive  |                       | —       |              | -.03    |
| Affect: Worry-concern |                       | —       |              | .06     |
| Total $R^2$           |                       |         | .50**        |         |

\*  $p < 0.05$ ., \*\*  $p < 0.01$ . Note: PPT = Psychological perspective taking

To assess whether ToM and EU had a similar influence on teacher rated problem behaviours, the overall (2-step) model was re-run with either ToM or EU included in place of the composite PPT variables. Both models remained essentially unchanged, neither ToM,  $\beta = .10$ ,  $t(93) = 1.16$ , *ns*, nor EU,  $\beta = -.03$ ,  $t(93) = -.31$ , *ns*, had a significant impact on the prediction of teacher-rated problem behaviours at Time 2.

#### **(iv) Social preference**

Finally, in the fourth model, the contribution of children's emotional competence to their peer rated social preference was examined. On the first step, children's sex, verbal ability and Time 1 social preference were entered. This step was significant,  $F(3, 99) = 37.49$ ,  $p < 0.01$ , children's Time 1 social preference made a significant contribution to the prediction of Time 2 social preference. PPT, disengagement and affect group were included on the second step. In inclusion of the emotional competence variable did not significantly improve the overall model,

$\Delta F(4, 95) = .67, p < 0.05$ . No domain of emotional competence made an impact on peer rated social preference one year later, over and above the longitudinal stability in children's social preference (see Table 9.6).

Table 9.6  
Hierarchical multiple regression analyses predicting Time 2 social preference (N = 103)

| Variable              | Model 4              |         |              |         |              |         |
|-----------------------|----------------------|---------|--------------|---------|--------------|---------|
|                       | T2 Social preference |         |              |         |              |         |
|                       | Step 1               |         | Step 2       |         | Step 3       |         |
|                       | $\Delta R^2$         | $\beta$ | $\Delta R^2$ | $\beta$ | $\Delta R^2$ | $\beta$ |
|                       | .53**                |         | .01          |         | .03*         |         |
| Sex                   |                      | -.04    |              | -.04    |              | -.07    |
| Verbal ability        |                      | .07     |              | .00     |              | .01     |
| T1 Social preference  |                      | .72**   |              | .69**   |              | .69**   |
| PPT                   |                      | –       |              | .13     |              | .33**   |
| Disengagement         |                      | –       |              | .00     |              | -.03    |
| Affect: Inexpressive  |                      | –       |              | -.03    |              | -.02    |
| Affect: Worry-concern |                      | –       |              | .02     |              | .04     |
| Disengagement X PPT   |                      | –       |              | –       |              | -.28*   |
| Total $R^2$           |                      |         | .55**        |         | .58**        |         |

\*  $p < 0.05$ ., \*\*  $p < 0.01$ . Note: PPT = Psychological perspective taking

To assess the combined influence of children's disengagement and PPT, an interaction term was computed using standardised scores (PPT x disengagement) and included on a third step of the overall model. The addition of the interaction term significantly improved the overall model,  $\Delta R^2 = .03, \Delta F(1, 94) = 6.89, p < 0.05$ , and the interaction term was significant. Furthermore, with the addition of the interaction term, PPT was also a significant predictor. Figure 9.1 depicts the interaction relationship. Children who disengaged more than average, regardless of their perspective taking skills, had the lowest social preference ratings, while children who disengaged less were likely to have better social preference ratings if they also had better PPT skills.

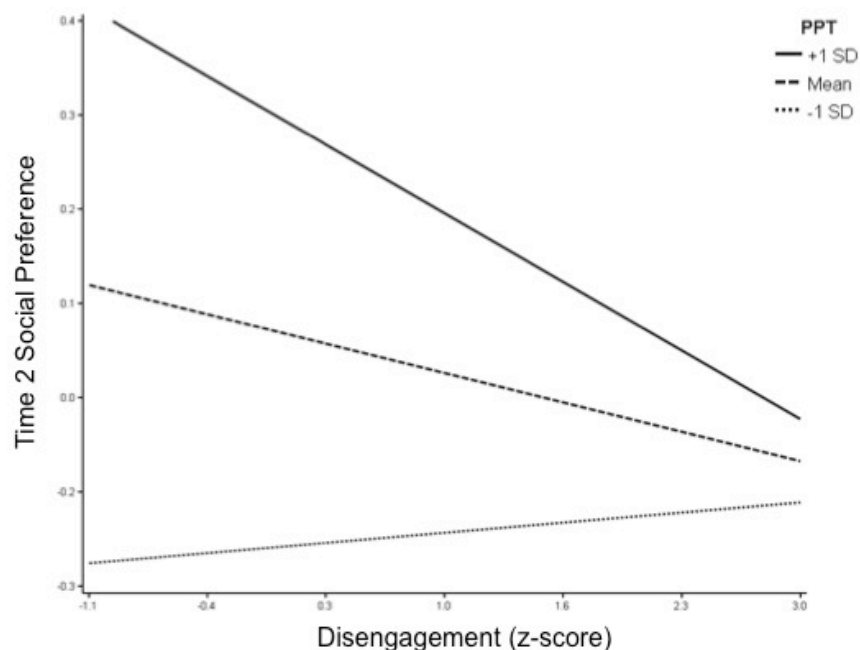


Figure 9.1. Interaction between perspective taking ability and disengagement at Time 1 on social preference at Time 2

Finally, to assess whether ToM and EU had a similar impact on peer-rated social preference, the (two-step) model was re-run with either ToM or EU in place of other combined PPT variable. Both models remained essentially unchanged, neither ToM,  $\beta = .08$ ,  $t(96) = .93$ , *ns*, nor EU,  $\beta = .11$ ,  $t(95) = 1.36$ , *ns*, had an impact on the prediction of peer-rated social preference at Time 2.

#### 9.4 Discussion

The current chapter investigated the longitudinal relation between children's emotional competencies at kindergarten and their teacher and peer rated social adaptation one year later. Children's emotion regulation, affective responding, and understanding of mind and emotion were examined as simultaneous predictors of social adaptation over and above the longitudinal stability in social functioning. This study extends the findings presented in Chapter 6, which showed that different domains of emotional competence were independently associated with children's concurrent social adaptation. The prediction that different domains of emotional competence would longitudinally predict social adaptation was partially supported. When considered simultaneously, disengagement, EU and affective responses at

Time 1 were related to children's social maturity as rated by teachers at Time 2, over and above the longitudinal stability in social maturity. However, there were less consistent patterns of associations between children's emotional competence and other domains of social adaptation.

Importantly, the degree to which children disengaged from challenging emotional vignettes was involved in the longitudinal prediction of *all* social adaptation measures. The current chapter, therefore, further extends the findings presented in Chapter 8 by demonstrating that less disengagement was longitudinally related to greater social maturity and fewer problem behaviours, even when controlling for children's understanding of mind and emotion and expressions of affect. This finding highlights the importance of children's emotionally well-regulated behaviours for later socially adaptive behaviour.

Children's affective responding was also longitudinally associated with social maturity, but not in the manner that was predicted. The regression model predicting social maturity at Time 2 indicated that children's who were inexpressive rather than expressing sadness were likely to be rated more highly by their teachers as socially mature one year later. Although initially vexing given both the other findings presented in this thesis and the mean level of social maturity for the affect categories presented in Table 9.2, it may be understood with reference to the other variables that were controlled for in the model. In particular, the longitudinal impact of affective responses was examined holding constant children's social maturity at Time 1, which was found to be significantly different across affect groups (see Chapters 4 and 6). In the regression model, therefore, controlling for the impact of Time 1 social maturity resulted in adjusted means for the affect categories that were not reflective of the true differences in social maturity at Time 2 between inexpressive and sad children. Indeed, this was confirmed when removing Time 1 social maturity from the model; the direction of this finding was reversed such that children expressing sadness were predicted to have greater social maturity at Time 2 compared to inexpressive children, although this result was non-significant. Given this result, it appears that there is little influence of children's affective responses to an empathy eliciting situation at Time 1 and their social adaptation at Time 2.

In addition to an examination of the longitudinal relation between children's disengagement and affective responses to challenging vignettes, the current study sought to explore the impact of children's understanding of mind and emotion on later social adaptation. First, unlike the findings presented in Chapter 6, children's empathic role-taking was unrelated to any measure of social adaptation. That is, there was no relation between children's proclivity to take the perspective of another in distress and their social functioning. While empathic role-taking has been previously examined in the literature (e.g., Eisenberg, Fabes, Murphy, et al., 1996; Miller, et al., 1996; Roberts & Strayer, 1996), it is most commonly assessed concurrently with measures social adaptation. The current findings provide evidence that empathic role-taking may not be a good indicator of children's later social functioning at these ages.

Second, and somewhat unexpectedly given the findings of Chapter 6, children's psychological perspective taking (PPT), comprising both ToM and EU, was not longitudinally related to any measure of social adaptation. However, when the differential impact of ToM and EU on social adaptation was explored it was found that EU, but not ToM, was longitudinally related to children's teacher rated social maturity. In Chapter 6, ToM and EU showed a similar relation to teacher rated social competence (comprising both social skills and social maturity). However, it was ToM understanding that was more robustly related to children's peer rated social preference. However, children's EU emerges as a better longitudinal predictor of social competence compared to ToM understanding. Past research has also suggested that ToM and EU are differentially related to social competence (e.g., Weimer & Guajardo, 2005). The current findings, in combination with the findings presented in Chapter 6, suggest that ToM, a core psychological insight, is important for children's social adaptation (in particular, their peer rated social preference) in kindergarten. But, as children's socio-cognitive abilities mature, EU emerges as important for adaptive social functioning. This is not to say that children's ToM does not play a role in social adaptation at age 6; *only* that individual difference in earlier ToM understanding are not predictive of differences in later social functioning. In part, these findings may be explained by the different approach to EU and ToM

measurement. The ToM measures focused specifically on false belief understanding and tapped meaningful variation in kindergarten. EU measures tapped a broad range of psychological insights, some of which are more relevant to older children (e.g., hiding emotions, belief-based emotion understanding).

Although both disengagement and PPT were found to be unrelated to children's peer rated social preference when considered independently, the interaction between children's disengagement and PPT was a significant longitudinal predictor of social preference. Children who were less likely to disengage from the emotionally challenging vignettes were more likely to have better social preference ratings if they also had better PPT skills, whereas children who frequently disengaged from the vignettes were likely to be less socially liked by their peers regardless of their PPT skills. A similar interactive relation was found in Chapter 6 predicting children's concurrent problem behaviours. Together, these findings suggest that in order to understand children's social adaptation, concurrently and longitudinally, it is important to examine both their experience of emotion and their understanding of emotion, as well as an interactive relation between these two constructs. In particular, the findings of the current chapter underscore this conclusion. Without an examination of the interactive influence of disengagement and PPT on children's social preference, it would appear that children's emotional competence does not play a role in their predicting later social preference.

In contrast to the findings presented in Chapter 6, gender emerged as a significant predictor of children's social maturity. Overall, girls were rated as more socially mature compared to boys, and this gender difference remained when accounting for children's earlier emotional competence. Although gender differences in social behaviours is common (see Archer, 1992; Rose-Krasnor, 1997), gender differences across questionnaire measures of social competence is less common (Rose-Krasnor, 1997; Rubin, Bukowski, & Parker, 2006). In the current analyses, a gender difference only emerged for the social maturity measure, there was no such gender difference for social skills, problem behaviours or social preference. The gender difference, therefore, appears specific to the manner in

which social maturity was measured and may be a function of the age-referenced and comparative nature of the likert-scale, and warrants further investigation.

Finally, together with the findings presented in Chapter 8, the current analyses demonstrate the impressive stability in children's social adaptation during the first years of schooling. In particular, social preference was highly stable from Kindergarten to Year 1. This finding emphasises the influence of children's history of previous social interaction on their current social adaptation, and supports the predictions made by de Rosnay et al. (2008), concerning the importance of children's 'social track-record' for their later social adaptation, especially when rated by peers (see also Mostow, et al., 2002). Finally, despite significant stability in social skills and social maturity, in addition to a robust association between these two measures, social skills and social maturity were differentially related to children's emotional competence when this relation was examined longitudinally. Overall, these findings suggest that a child's teacher rated social maturity, compared to the social skills in a classroom context, may be a more sensitive measure of social adaptation at the transition to school, particularly when examining the outcome of individual differences in children's emotional processes.

In the final chapter of this thesis, an overall summary of the findings will be presented and these will be examined in light of the conceptual and methodological issues raised in Chapters 1 and 2.

## Chapter Ten

### General Discussion

#### 10.1 Introduction

The current thesis has specified a framework for understanding how children manage their responses to emotionally challenging events and, furthermore, explored how these responses are related to social adaptation both concurrently and longitudinally. Throughout this thesis, children's behavioural and affective responses have been examined together as a complete indicator of the child's emotional experience, comprising both an emotional response and the management of this emotional response. That is, children's emotion regulation has been inferred from what they actually *do* in challenging situations. This has proved to be a fruitful methodology for examining the relation between children's emotion regulation and their social adaptation.

Three main sets of findings emerged from the current thesis. First, across two studies, it was found that children's behavioural and affective responses were able to be reliably assessed during challenging events, and these responses were largely specific and appropriate to the situational context (Section 10.2). Second, children's behavioural responses to challenging events were meaningfully related to measures of social adaptation, both concurrently and longitudinally (Section 10.3). Finally, children's behavioural responses to challenging events were independent from their understanding of emotion, with both domains simultaneously related to children's social adaptation, both concurrently and one year later (Section 10.4). In this chapter, each of these major findings will be outlined, including a discussion of the implications of these results. Within each section, the merits and limitations of the current research are discussed, and possible directions for future research are outlined.

## **10.2 The structure and function of children's behavioural responses to challenging events**

### ***Conceptual and methodological approach***

Emotion regulation is a broad construct that has been assessed in a diverse range of ways across a broad developmental time-frame. Emotion regulation thus take on many difference approaches, including a focus on attachment relationships (e.g., Sroufe, 1995), self-reflective processes (e.g., Meerum Terwogt & Olthof, 1989; Stegge, et al., 2004), and parent and teacher report (e.g., Rothbart, et al., 2001; Rydell, et al., 2003; Shields & Cicchetti, 1997). A commonly employed method of assessing children's emotion regulation is the direct observation of behavioural responses during challenging and non-challenging situations. Such research has focused mainly on the behavioural and affective responses of infants and toddlers that are directly elicited during challenging emotional situations (Buss & Goldsmith, 1998; Gilliom, et al., 2002; Grolnick, et al., 1996; Stifter & Braungart, 1995). When behavioural responses to challenging situations are elicited in preschool and school-aged children, they are typically elicited vicariously, often via video vignettes (e.g., Cole, et al., 1996; Cummings, et al., 2009; Eisenberg & Fabes, 1995; El-Sheikh, et al., 1994). This research suggests that, from infancy, children reliably display certain behaviours when faced with challenging event, and some of these responses are thought to assist in the regulation of arousal.

As outlined in Chapter 1, there are a number of conceptual issues surrounding the construct of emotion regulation. In the current thesis, children's experience and regulation of emotion were examined in their entirety by observing what children actually do in emotionally challenging situations and without trying to force a distinction between the elicited emotion and the regulatory process. In this manner, the problems associated with teasing apart the experienced emotion from the regulation of emotion, as outlined in Chapter 1, are avoided. Of course, children's socialisation environment and temperament play an important role in shaping their behavioural responses to challenging emotional events. The approach taken in the current thesis, however, centres on observed behavioural responses to challenging situations, which is, most likely, the distillation of both socialisation

processes and temperament. That is to say, the objective of the current thesis was not to explain *how children come to differ* in their emotional responding but rather explore *how children differ* in their emotional response and how this can be understood in and of itself, and in relation to other indices of behavioural functioning.

In the current thesis, children's regulatory responses were observed during emotionally challenging situations. Children's responses were elicited vicariously, via video vignettes, to allow for an examination of their responses to a diverse range of emotionally challenging situations. Two independent studies were conducted, each using a similar methodological approach to observe children's behavioural responses around the time of transition to formal schooling. A distinguishing feature of the current methodology centres on the type of contexts that were chosen to elicit behavioural responses. Largely, these vignettes comprised situations that children were likely to have directly experienced themselves or witnessed in peers/siblings. Furthermore, the majority of the vignettes comprised an emotional display that is centred firmly within an ongoing narrative. Children were not presented with very exceptional and upsetting events, and they were not presented (except in vignettes 1 and 2) with isolated emotional displays. The current findings suggest that there is an important distinction to be made between simply observing the emotional display of another compared to a contextually-based emotional display.

In order to infer something meaningful about a child's behavioural responses to a challenging emotional vignette, such responses must be carefully interpreted, with close consideration given to the situational context eliciting these responses (Cole, et al., 2004; Thompson, 1994). Across two separate studies, and multiple eliciting contexts, the current thesis closely examined the structure and function of different behavioural responses to challenging events. It was necessary to first interpret the meaning of different behavioural and affective responses, prior to examining the relation between specific behavioural responses and social outcomes. In addition to observations of children's behavioural responses, children's emotion regulation was assessed using heart rate variability, an independent physiological

marker indicative of regulatory processes, in order to provide a further validation of the interpretation of these behavioural responses.

The methodological approach of the current thesis expands the literature by examining multiple emotionally challenging contexts, and testing predictions concerning the degree to which behavioural responses were elicited across different emotional events. Furthermore, the eliciting contexts were explicitly chosen to represent contexts that likely to be relevant for social adaptation and, importantly, comprising events that were within the comprehension of the young child. In addition, where possible, the video vignettes presented genuine emotional displays so that they represented authentic emotional experiences. In Study 1, an analysis of children's behavioural responses to the specific events unfolding in an emotional situation was undertaken. Understanding the manner in which older children manage their emotional arousal within the context of an unfolding narrative assists in determining the meaning of certain behavioural responses in this developmental window. Study 2 expanded upon the findings of Study 1 by introducing multiple eliciting contexts. In Study 2, children were shown a range of different emotionally challenging contexts, allowing for a comparison of behaviours across different challenging emotional themes (e.g., parental separation, social exclusion).

The inclusion of multiple different emotionally challenging vignettes also allowed the stability of behavioural responses across different contexts to be explored. There have been mixed findings in the literature regarding the consistency of children's behavioural responses across different emotionally challenging events (Eisenberg, McCreath, et al., 1988; Grolnick, et al., 1996; Miller, et al., 1996). Determining the stability of behavioural responses is particularly important for both theoretical and empirical reasons. Empirically, it is common to aggregate children's behavioural responses across multiple vignettes, and use this aggregate as an indicator of children's regulatory skills. If children's responses are not stable then the meaning of this aggregate is difficult to interpret. Theoretically, it is important to determine the stability of children's behavioural responses across different challenging events to distinguish between those responses that are stable dispositions of the child and those behaviours that are also highly contextually-

bound. This distinction appears to be especially important when examining the relevance of specific behaviours for children's social adaptation.

Finally, the current thesis, also examined the longitudinal stability of behavioural responses. Given the theoretical importance of the behavioural management of emotional responses for social adaptation, it is crucial to determine if these responses are stable characteristics of children's behavioural repertoire across time. If behavioural responses are not stable over time, then the relevance of specific responses for socio-emotional outcomes becomes less plausible. Somewhat surprisingly, however, there has been very little research on the longitudinal stability of behavioural responses. An examination of the longitudinal stability of children's behavioural responses to emotionally challenging events, therefore, makes an important addition to the literature.

***A focus on behavioural responses and eliciting contexts***

Across two independent samples of children, the current thesis found that many of children's behavioural responses were systematically associated with different emotionally challenging situations. Furthermore, specific behaviours displayed predictable patterns of elicitation across challenging events with different emotional themes. As expected, certain behaviours (i.e., disengagement, communicative bids, affective expressions) were more likely to be elicited during emotionally challenging events, while other behavioural responses (i.e., self-soothing, agitative activity) were less dependent on the eliciting context and instead reflected stable dispositions of the child. Despite the profoundly contextually bound nature of many behavioural responses, there was impressive stability in individual differences in children's behavioural responses when assessed both across events in the same vignette (Study 1), and across different vignettes (Study 2). It is worth reflecting on the significance of this finding. In the emotion regulation literature, there is often a focus on stable behavioural traits (e.g., temperament) or specific patterns of responding (e.g., attentional control in a given context). The findings presented in this thesis offer a vivid illustration of both the importance of situational context and the stability of individual differences. Drawing upon the evidence presented in both Studies 1 and 2, the meaning and relevance of disengagement,

self-soothing behaviours, agitative activity (including gross agitative activity, minor agitative activity and mouthing), communicative bids, and affect are discussed in turn below, including, where appropriate, longitudinal stability.

Children's attentional control as an index of emotion regulation is often examined in the literature, with both attention focusing and attention shifting indicative of well-regulated responding in different contexts (Eisenberg, Fabes, et al., 2000; Eisenberg, Fabes, Murphy, et al., 1996; Eisenberg, et al., 2004). In the current thesis, when the vignette depicted a protagonist in clear and sustained emotional distress (but not fear), there was a corresponding increase in disengagement. The systematic relation between disengagement and the eliciting context speak to importance of this strategy for managing arousal in school-aged children, and supports the literature examining disengagement in infants and toddlers (e.g., Diener & Mangelsdorf, 1999; Grolnick, et al., 1996; Stifter & Braungart, 1995). As predicted, however, disengagement also showed a specific relation to fear inducing events, such that an overall decrease in disengagement was observed during a fearful vignette, a finding which is suggestive of attentional capture, and fits comfortably within the literature examining the functional nature of fear as marshalling attentional resources (e.g., Mogg & Bradley, 1999).

Despite the contextual specificity of children's disengagement, it was also found to be a highly stable individual difference in responding. Thus, despite the systematic relation between disengagement and the eliciting context, some children were more likely to employ disengagement as a behavioural strategy compared to others across all vignettes. Such consistency was found at Time 1, when children were five years old, and Time 2, one year later. Finally, disengagement was also found to be a stable behavioural response across the two time-points. The importance of attentional control for emotion regulation has been shown across the life-span, the current findings expand the extant literature by suggesting that children's disengagement, while highly related to context, is also a stable disposition of the child across a whole range of different challenging events and, furthermore, is a stable behavioural response over time.

Self-soothing behaviours, such as thumb-sucking, have been most closely examined in infants and toddlers (e.g., Grolnick, et al., 1996; Rothbart, et al., 1992), and it was expected that these responses would be indicative of stable dispositional response styles by school-age, rather than represent a general strategy to manage arousal under challenging circumstances. This prediction was largely supported. In Study 1, children's self-soothing behaviours were observed consistently across neutral and emotionally challenging epochs in the infant-mother separation vignette, suggesting that self-soothing behaviours are a stable individual difference in children's responding. When examined in Study 2, there were too few instances of self-soothing to allow a meaningful examination of this response. Overall, these findings suggest that the utility of self-soothing behaviours as a means to manage arousal decreases markedly with age, supporting the findings of Gilliom et al. (2002). An examination of the individual differences in the use of self-soothing behaviours as a function of children's specific emotional experiences may be a fruitful area of research. Given the emotional content of the infant-mother separation vignette (and the first day vignette employed in Study 2), there may be meaningful differences in the use of self-soothing behaviours by attachment styles, for example. In particular, if self-soothing is individual of a lack of maturity one might speculate that insecure-resistant children will show elevated self-soothing behaviours (Sroufe, 1995).

Three modes of children's agitative activity were examined, gross agitative activity, comprising large movements of the body, minor agitative activity, including fine movements of the hands and fingers, and mouthing behaviours, comprising manipulation of the mouth with the hands and tongue, and facial grimaces. These modes of agitation have not, to date, been examined concurrently in the extant literature and, somewhat surprisingly, there was a profound independence across these different modes of agitative activity. However, simply because these modes of responding were uncorrelated is not to say that they don't functionally achieve the same outcome. The current thesis suggests that there are two distinct kinds of agitative activity. The first comprises gross agitative activity. Changes in gross agitative activity appeared responsive to changes in the emotional content of the eliciting vignette. In Study 2 it was found that decreases in gross agitative activity co-

occurred with events that involved the anticipation of emotional distress. This finding suggests that changes in this behaviour are associated with marshalling of attention, and supports research that suggests that children's ability to inhibit movement is associated with emotion regulation (e.g., Eisenberg, et al., 2001; Eisenberg, Michalik, et al., 2007). Furthermore, gross agitative activity was unrelated to children's impulsivity.

The second kind of agitative activity comprised minor agitative activity and mouthing, with these responses appearing functionally similar. Both minor agitative activity and mouthing were elicited at comparable rates across both challenging and less challenging vignettes. While minor agitative activity showed a moderate decrease during the anticipation of emotional distress, this reduction was considerably less marked compared to gross agitative activity. Providing further support of the functional similarity between minor agitative activity and mouthing was their similar pattern of relations with impulsivity (and inappropriate comments, described below). The association between minor agitative activity/mouthing and teacher rated impulsivity suggests that these responses, unlike gross agitative activity, are indicative of individual differences in children's behavioural responses, observed across a wide-range of different contexts.

Children's communicative bids were also examined in the current thesis. In Study 1, the child's communicative overtures were examined regardless of their verbal content. This approach was refined in Study 2, where the content of each comment was examined. Connected comments, comprising those comments that were relevant to the unfolding vignette, and inappropriate comments, comprising comments that were unrelated vignette, were stable across different vignettes, and robustly correlated. This correlation suggests that inappropriate comments occurred in the context of children who made many comments, however not all children who spoke frequently made inappropriate comments. Together, these findings suggest that communicative bids are characteristic of individual differences in children's behaviour across multiple contexts, with some children more likely to make a communicative bid regardless of the vignette content. However, these findings must be tempered with the fact that there were relatively few comments made across the

vignettes, and as outlined in Chapter 4 (Section 4.4). Both connected and inappropriate comments were positively related to children's impulsivity, which suggests that these responses, in the context of the emotion elicitation paradigm, reflect an inability to inhibit behaviour. It should be noted that the methodology applied in the current study was not designed to elicit and examine children's verbal bids for communication, but the current findings suggest that this is an interesting area for future research.

Finally, children's affective responses were examined across both specific events and different vignettes. In the extant literature, both expressions of worry-concern and sadness in different contexts have been conceptualised as indicative of affective empathy (Eisenberg, 2000b; Eisenberg, Fabes, et al., 1988; Hastings, et al., 2000; Strayer, 1993). In the current thesis, expressions of worry-concern and sadness showed a unique pattern of responding across different challenging vignettes. Expressions of joy, anger and fear were, as expected, very infrequent and were not analysed in the current thesis. Expressions of sadness were contextually constrained; this expression was only observed in those contexts thought to be empathy eliciting. Worry-concern, by contrast, appeared more frequently across a range of different emotionally challenging vignettes. When examining the longitudinal stability of affective responses, they were found to be stable over a whole year when examined in the same context, suggesting that children are consistent in their manner of responding. Furthermore, at both Time 1 and Time 2, these expressions showed exceptional independence, with children likely to respond with either worry-concern or sadness. The findings presented in Chapter 5 provide further evidence of the distinct nature of these two affective expressions. Worry-concern was related to lower levels of heart rate variability (HRV), indicative of poor emotion regulation, whereas expressions of sadness during a specific empathy eliciting vignette were associated with greater levels of HRV, indicative of emotionally well-regulated responding.

Overall, the findings of this thesis suggest that expressions of sadness in the context of empathy eliciting situations depicting a protagonist's emotional distress (i.e., the mother-infant separation vignette, the first day vignette) are likely to be

indicative of empathic responding, whereas expressions of worry-concern were more likely to be a manifestation of children's personal distress. Given the contradictory findings in the literature regarding worry-concern and sadness as expressions of empathy, it is clear, however, that affective empathy is highly contextually bound. As noted in Chapter 4 (Section 4.4) situational contexts involving physical injury are likely to elicit 'empathic' worry-concern (e.g., Hastings, et al., 2000; Miller, et al., 1996) whereas situations involving emotional distress are likely to elicit empathic sadness (e.g., Eisenberg, Fabes, et al., 1988; Strayer, 1993). This is, of course, a testable hypothesis; thus, it would be expected that children who evince sadness in responses to the emotional plight of another would be more likely to express worry-concern in the context of personal injury. Exploring the relation between the specific empathy eliciting contexts and children's expressive responses is a fertile area for future research investigating affective empathy.

However, the relation between children's HRV and their affective responses does raise some issues about how children should be categorised according to the affective response. In Chapter 5 it was found that any manifestation of sadness was related to more adaptive HRV, whereas, only worry-concern expressed in the absence of sadness was related to children's poorer physiological regulation. As noted in Chapter 5, this finding supports Eisenberg and Fabes' (1992) conceptualisation of the relation between emotion regulation and empathy. Children who are well-regulated have the capacity to express empathy, as such any indication of empathic sadness is suggestive of the child's ability to regulate their emotional response. Conversely, children who are poorly regulated do not have this same capacity for empathy and, as such, express exclusively worry-concern. This subtle finding poses problems for the categorisation of children based on their dominant affective response, which potentially rides roughshod over the relation between empathy, personal distress and emotion regulation. However, there was no direct relation between HRV and social adaptation which suggests that the behavioural analysis of responding, including the idea of dominant affect, may be a valid measure for understanding children's social adaptation.

### ***Overall independence of behavioural domains***

Across both Study 1 and Study 2, there was stunning independence of behavioural domains, with different behavioural responses to the emotionally challenging vignette almost entirely unrelated. The independence of different behavioural domains suggests the experienced emotion does not appear to elicit more regulatory behaviours, such as disengagement. In particular, the findings of Study 1, which examined behavioural responses across events of a single vignette, do not imply that children's later behavioural responses are dependent on earlier responses patterns.

The independence of behavioural domains highlights an important distinction between different methodologies for examining children's responses across different events. There are four major approaches to the study of children's behavioural responses and each of these have different implications for what is measured and how relations between behaviours are expected to entail. The first is research investigating children's temperament, with a focus on the stability of children's behavioural responses across a range of diverse situational contexts (e.g., Kochanska, et al., 2000). Within the temperament literature, it is not expected that different behaviours will be associated. Instead, responses are expected to be stable across contexts and, therefore, characteristic of the child's general proclivity to respond in consistent ways. The second approach is an examination of children's contextually-bound behavioural responses. This method is common in the literature (e.g., Grolnick, et al., 1996) and has been applied in the current thesis (Study 2). It has been found, using this approach, that children's behavioural responses are highly independent when examined across vignettes. The third approach, which is less common, is to examine children's behavioural responses within events. Within this approach, both time and context are examined to chart children's changing behavioural responses to the challenging content (e.g., Buss & Goldsmith, 1998). The examination of children's behavioural responses to specific events has also been employed in the current thesis (Study 1); again, children's behavioural responses across events were independent. These three methodologies have distinguished the literature on children's behavioural responses to challenging events, and there is

little evidence that there is a meaningful relation across different behavioural domains.

However, it is plausible, indeed probable, that within an individual child, there will be a close relation between an experienced emotion and rapid behavioural strategies that act to manage the associated arousal when children's behavioural responses are examined moment-by-moment. In this sense, a moment-by-moment examination of children's behavioural responses would allow the extent to which the onset of arousal precipitates regulatory responses. However, at this level of analysis it is likely that individual differences will also play a more central role. That is, temperamental factors and individual developmental histories will shape the manner in which each child experiences and responds to his/her arousal. As each child is expected to demonstrate a different causal relation between arousal and regulation, this approach necessarily requires a within subjects and within contexts analysis. To some extent, the Strange Situation relies on these assumptions (Sroufe, 1995). This is the next frontier for research examining children's behavioural responses to emotionally challenging events.

Against a backdrop of independence, there was one important exception; children's disengagement and affective responses were consistently related both within the same event and, more broadly, across different challenging events. This exception is important because it provides evidence for the relation between emotion regulation and children's empathic responses. The extant literature has provided broad support for the relation between emotion regulation and empathy. Children who are emotionally well-regulated are likely to experience empathy (e.g., Eisenberg & Eggum, 2009; Eisenberg, Fabes, Murphy, et al., 1996; Gurthrie, et al., 1997). While the extant literature has demonstrated an association between empathy and emotion regulation, it has relied on global measures of children emotion regulation (e.g., using parent or teacher report) and observed measures of empathy, or vice versa. There is little evidence of an association between the two constructs using observed measures for both. Examining both observational measures of emotion regulation strategies and affective empathy in the same context would provide further evidence of their relation, by demonstrating the co-

occurrence of both processes together. Providing evidence of the relation between emotion regulation and empathy without relying on parent or teacher report measures is important given the potential overlap between these constructs when assessed using questionnaires. The findings of Chapters 4 and 7 demonstrate a modest relation between children's disengagement and their expressions of affective empathy at Time 1 only, which was further confirmed by an association between adaptive physiological regulation and empathic sadness in Chapter 5. Together, these chapters imply that children who were more well-regulated, indexed by both disengagement and HRV, were more likely to express sadness as opposed to worry-concern. There was no such association between emotion regulation and empathy at Time 2.

The findings of this thesis suggest only a modest relation between emotion regulation and empathy, especially in light of the lack of association between these two constructs at Time 2. Eisenberg and Fabes (1992) clearly assert that although emotion regulation and empathy share a close conceptual relation, emotion regulation is a necessary but not sufficient condition for empathy. Thus, other factors, such as the child's socialisation environment (Eisenberg, et al., 1998) also play an important role in children's empathy. However, there were also methodological factors that may explain the modest relation found in the current thesis.

First, the relation between empathy and disengagement was highly contextually dependent, with affective empathy derived from one vignette only. Although, it should be noted that this vignette was a priori expected to be the context in which the relation between emotion regulation and empathy would be the strongest. Second, the modest relation between emotion regulation and empathy may have been due to the manner in which children's affect was categorised. In Chapter 4, children were classified on the basis of their dominant affect, as a result, there were children who expressed predominantly worry-concern but also some sadness, although this group was not large. Nevertheless, including children who did express some sadness in the worry-concern category may have weakened the relation between emotion regulation and empathy. However, in

Chapter 7, this relation was re-examined using the duration of each affective response in place of a category and the finding remained modest. Furthermore, using duration of expressed affect at Time 2 revealed no such relation between disengagement and affective empathy. Given the contextual specificity of this relation at Time 1, the lack of association between the two constructs at Time 2 suggests that the eliciting context at the second time-point was no longer appropriate. That is, by children's second year of school, the empathy eliciting vignette, which centres on a distressed boy's separation from his parents on his first day of school, is no longer such a salient narrative for children. Thus, the sadness elicited by this vignette at Time 2 may no longer be a meaningful indicator of emotion regulation.

Overall, this thesis demonstrated that children's behavioural responses were highly contextually dependent, both at the level of specific events within a vignette narrative (Study 1), and across vignettes with different emotional themes (Study 2). However, despite the systematic relation between children's behavioural responses and the eliciting context, there was robust stability in responses across different vignettes. The stability of behavioural responses implies that individual differences in children's responses are highly consistent across a broad range of eliciting contexts. Furthermore, when examined across time, children's responses were stable. In the following section, the relevance of children's behavioural responses to challenging events and their social adaptation is discussed.

### **10.3 The association between children's behavioural responses and social adaptation**

The second aim of the current thesis was to examine the relation between children's behavioural responses and their social adaptation. In Study 1, children's social conduct was measured by mothers, whereas, in Study 2, children's social adaptation was rated by both teachers and peers, to provide a broader understanding of the child's social competencies and problem behaviours. The extant literature has closely examined the relation between children's emotion regulation and their social adaptation. This research suggests that those children

who are well-regulated are likely to be socially competent and accepted by their peers, whereas children who are poorly regulated are likely to exhibit problem behaviours and experience difficulties in their peer relationships (Calkins, et al., 1999; Cole, et al., 1996; Eisenberg, Fabes, Murphy, et al., 1995; Eisenberg, et al., 1997; Eisenberg, Spinard, et al., 2010; Eisenberg, Valiente, et al., 2010; Rubin, et al., 1995). Research specifically examining children's observed behavioural responses to challenging events has also found clear associations between specific behavioural responses and social adaptation (e.g., Calkins, et al., 1999; Eisenberg, et al., 2001; Gilliom, et al., 2002). In particular, the manner in which children manage their attention has proved an important index of regulated responding (Cortez & Bugental, 1994; Eisenberg, Fabes, Guthrie, et al., 1996; Gurthrie, et al., 1997). However, within these broad relations between regulated responding and social adaptation, an emphasis must remain on the importance of context for understanding emotion regulation (Thompson, 1994). As outlined in Chapter 1, specific behavioural responses cannot be considered inherently good or bad, but rather they must be considered in light of how appropriate the response is to the eliciting context, and the child's goals within this context.

In keeping with the contextually bound nature of emotion regulation, it was expected that a close examination of the eliciting context would be necessary to interpret the relation between adaptive emotion regulation and social competence. The methodology employed in the current thesis allowed a particular focus on the importance of eliciting context for understanding the relation between emotion regulation and social adaptation by including multiple vignettes with differing emotional themes. The findings of this thesis demonstrate that certain behavioural responses, specifically disengagement and expressions of affect, were consistently related to children's concurrent social adaptation. Furthermore, in the case of disengagement, it was also longitudinally related to social outcomes.

Importantly, the pattern of relations between behavioural responses and social adaptation was considerably more robust when behavioural responses were examined in more challenging events (i.e., the separation epoch) or vignettes (i.e., vignettes 1, 3, 7 and 8). This finding supports the work of Cortez and Bugental

(1994), who found no association between children's disengagement during a neutral or positive events and their social adaptation. It appears that behavioural responses in a non-challenging event have a different meaning to those elicited under more stressful circumstances. When behaviours are elicited during challenging events they appear to be more reflective of the child's social competencies.

From Study 1 and 2, disengagement and affective expressions emerged as consistently related to children's social adaptation. However, in addition to disengagement and affect, inappropriate comments were also robustly related to social adaptation. In Study 1, there was no relation between communicative bids, and maternally rated social adaptation. In Study 2, when the content of these communicative bids was coded, a consistent relation between inappropriate comments and children's teacher rated social adaptation emerged. Indeed, this was a very strong relation and emerged most robustly in response to challenging vignettes (vignettes 1, 3, 7 and 8) There was no such relation between children's relevant, connected comments and their social adaptation. Children who made inappropriate comments were likely to be rated as less socially mature and as having higher levels of problem behaviours. The use of inappropriate comments may have signified an attempt by the child to avoid the content of the challenging events. This interpretation is further supported by the fact that the relation between inappropriate comments and social adaptation was limited to those vignettes that were emotionally challenging. When children made inappropriate comments during more pedestrian vignettes (vignettes 2, 4, 5 and 6), they unrelated to their social competencies. Impressive those these finding may be, relatively few children made comments during the Emotion Elicitation Paradigm, and even fewer made inappropriate comments. While the relation between inappropriate comments and social adaptation is intriguing, in particular in light of its contextual specificity, further research is required using a paradigm that is more conducive to the child's verbal communicative bids.

As noted above, there was a robust relation between children's disengagement and their social adaptation. The extant literature has focused on the importance of both attention shifting (i.e., disengagement) and attention focusing

for children's adaptive emotion regulation and social competence (Calkins, et al., 1999; Cortez & Bugental, 1994; Eisenberg, Fabes, Guthrie, et al., 1996; Gurthrie, et al., 1997). As noted in Chapter 2, in order to determine the adaptive value of disengagement, it is critical to examine the context within which the response was elicited. It was hypothesised that greater disengagement in response to a event that was challenging but, nonetheless, typical and within the experience of the young children, would be indicative of over arousal and poor emotion regulation. The themes depicted in the vignettes (e.g., parental separation, infant distress, peer conflict) employed in the current thesis were certainly within the experience of a typical child and, as such, excessive use of disengagement was predicted to be maladaptive. This prediction was supported both concurrently and longitudinally. Children who relied more heavily on the strategy of disengagement during emotionally challenging events were less socially competent, experienced higher levels of problem behaviour, and were less socially accepted as rated by peers. Furthermore, disengagement at Time 1 was related to social maturity and problem behaviours at Time 2 demonstrating the enduring influence of disengagement on social adaptation. In fact, of all behavioural responses, disengagement was most robustly and consistently associated with both socially competent responding and problem behaviours, both concurrently and longitudinally.

Further support for the importance of context in interpreting children's disengagement came from a comparison of the relation between disengagement and social adaptation across different vignettes. When disengagement was assessed during emotionally challenging vignettes it was robustly related to social adaptation. Disengagement was less robustly related to social adaptation in less emotionally salient vignettes (vignettes 2, 4, 5 and 6) and, finally, disengagement was unrelated to social adaptation when assessed during a non-emotional, neutral vignette (vignette 6). The data to substantiate the conclusions is presented in Sections 3.3.6 and 4.3.6 (see also Figure 4.7). The importance of context for the relation between disengagement and social adaptation may explain why there was no concurrent relation between disengagement and social outcomes at Time 2. It appears that by children's second year of schooling the specific vignettes that were emotionally

challenging are not longer salient for older children, and now appear to mirror the pattern of relations between disengagement in less challenging vignettes and social adaptation. Further research is needed with different, more developmentally appropriate, vignettes to examine the concurrent relation between social adaptation and children's disengagement in older children.

Another interesting avenue for future research would be the presentation of a series of vignettes with differing emotional content, and including some vignettes that are quite distressing (e.g., the narrative of a young girl burnt in a house fire as used by Eisenberg, et al, 1996; Gurthrie, et al. 1997), and other vignettes that comprise more typical experiences for the young children. Given the conclusions of the current thesis, it would be expected that children who disengage more from the distressing and less from the typical vignettes will be emotionally well-regulated and, in turn, more socially competent.

The relation between children's affective expressions and social adaptation again stresses the importance of the eliciting context. Expressions of sadness were impressively specific and, unsurprisingly, were only observed in a relatively high proportion of children in situations that were empathy eliciting. Furthermore, affect expressed in these empathy inducing situations was related to social adaptation. Children expressing sadness compared to worry-concern were more likely to be rated by their teachers as socially mature and less likely to exhibit problem behaviours. The association between sadness and social adaptation further supports the interpretation of sadness as indicative of empathy. The extant literature has also found modest relations between expressions of affect, broadly construed, and children's social adaptation (Eisenberg & Fabes, 1995; Fabes, et al., 1990; Miller, et al., 1996; Roberts & Strayer, 1996; Vaish, et al., 2009). However, unlike disengagement, there was no longitudinal relation between affect at Time 1 and social adaptation at Time 2. This finding suggests that perhaps changes in social competencies, within a typical sample, are not well indexed by children's empathic responses. Thus, from an empathy point of view, the manner in which the social outcome measures were conceptualised may have limited the applicability of empathy. However, it must also be noted that, compared to disengagement, which

was predictive longitudinally of social outcomes, there was considerably less affect sampled which necessarily limited the utility of this measure. Furthermore, whereas disengagement was sampled across four challenging vignettes, affective empathy was measured in only one vignette. Although children's affective responses were stable across time, the fact that they were measured in only one context may have limited their applicability to broad social outcome measures.

The modest relations between affective empathy and social adaptation suggest that empathy may not be as important a social driver as first believed, at least in a typical sample. Within the context of typically developing children, the lack of empathy may be a more important determinant of social competence (or a lack thereof). The findings presented in this thesis provide some support for this assertion. First, with the exception of a modest relation between sadness and social maturity presented in Chapter 8, the data presented in this thesis documenting the association between sadness and social adaptation centre on a comparison between sadness and worry-concern. Thus, these findings may instead be interpreted as an association between decreased social functioning and a lack of empathy. That is, children expressing worry-concern were found to have lower levels of social competence in comparison to children expressing sadness. Other research has also demonstrated an association between behavioural problems and expressions of worry-concern (Gill & Calkins, 2003).

Second, and more tellingly, there was limited evidence to suggest that expressions of sadness were any more adaptive than being inexpressive. This finding implies that inexpressive responses to an empathy eliciting vignettes are not a failure of empathy with inexpressive children similarly rated on measures of social adaptation compared to children expressing sadness. In addition, inexpressive children were no different from children's expressing sadness when examining their physiological profile, suggestive of comparable levels of regulation. Furthermore, children who were inexpressive still described themselves as feeling empathic in the empathic role-taking task (in Chapter 6). Together, these findings provide a compelling case for a shift in emphasis from the presence of empathy as a social driver, to the absence of empathic responses as inhibiting adaptive social

functioning. In the clinical literature, impairments in empathic responding have been closely associated with antisocial behaviours (Blair, 2007; Blair, Budhani, Colledge, & Scott, 2005; de Wied, Goudena, & Matthys, 2005; Guile & Cohen, 2010).

Overall, the findings linking specific behavioural responses and children's social adaptation turn on the context within which these behavioural responses were elicited. This finding has implications for the meaning of children's regulatory strategies when assessed in non-emotional settings. For example, older children are often placed under milder levels of emotional stress in order to directly assess regulatory strategies, such as the disappointing gift paradigm or persistence during a frustrating task (Cole, Zahn-Waxler, et al., 1994; Eisenberg, et al., 1997; Saarni, 1984; Spinrad, et al., 2006). The findings of the current thesis suggest that behavioural responses to these tasks may not be as relevant for children's social interactions and peer acceptance; instead, these behaviours may be more telling for children's appropriate goal-directed behaviours in a formal school setting. As discussed in Chapter 1, the choice of challenging content is highly important for the interpretation and meaning of the subsequent behavioural responses (e.g., in the attachment literature Bretherton, 1999; Bretherton & Munholland, 1999).

Finally, a broad limitation with the current research investigating children's behavioural responses and their social adaptation was the absence of a direct, observational measure of children's social competencies, such as prosocial behaviour or peer interactions. Given the observed nature of children's behavioural responses, and the specificity of these responses during challenging events and social adaptation, it would be interesting to examine the relation between children's observed regulatory strategies and their actual behavioural responses to real-life social challenges.

### **10.4 Emotion regulation and emotion understanding**

As outlined in Chapter 1, the emotion regulation literature has for the most part ignored the potential influence of emotion understanding on children's adaptive emotion regulation. There is a conceptual basis for the relation between emotion regulation and emotion understanding. Saarni (1999), Halberstadt et al. (2001) and

others (Meerum Terwogt & Olthof, 1989; Stegge, et al., 2004; Thompson, 1994) have all proposed that when children encounter an emotionally challenging situation they draw upon their abilities to manage their own emotional response, as well as their understanding of emotions. This conceptual relation between emotion regulation and emotion understanding must be understood within the context of development. Whereas the limited empirical research that has examined the association between emotion regulation and emotion understanding has done so within an individual differences framework in a limited developmental window (e.g., Cole, Dennis, et al., 2009; Denham, et al., 2003; Schultz, et al., 2001). This thesis examined the relation between emotion regulation and emotion understanding and, furthermore, explored their simultaneous influence on children's social behaviours both concurrently and longitudinally.

The current findings found a robust independence between children's experience of emotion, including their disengagement and affective responses to challenging events, and their emotion understanding. This finding supports the small extant literature on the independence of emotion regulation and emotion understanding within an individual differences framework (Denham, et al., 2003; Schultz, et al., 2001). Furthermore, both emotion understanding and emotion regulation were simultaneously related to children's social adaptation, both concurrently in Kindergarten and, to a lesser degree, one year later. Importantly, only children's emotion regulation was directly associated with problem behaviours, implying that poor emotion regulation rather than deficits in emotion understanding are predictive of children's problem behaviours, at least within a typical sample. Prior research has also demonstrated that antisocial behaviours are closely associated with poor emotion regulation rather than a poor emotion understanding (e.g., Hughes, White, et al., 2000).

The independence of emotion regulation and emotion understanding, however, does not imply that there is not a global relation between the two constructs across development. In fact, this is almost certainly true that both emotion understanding and regulation shape the manner in which children respond to challenging events, but this need not be manifest within an individual differences

perspective, particularly amongst typical children. Furthermore, the findings presented in the current thesis do not speak to the relation between emotion regulation and emotion understanding within clinical samples. In the context of children outside the normal spectrum, better emotion understanding in the context of poor emotion regulation may prove to be very helpful for social conduct and peer relations. The current findings support this assertion. Both concurrently and longitudinally, emotion regulation and emotion understanding had an interactive relationship when predicting social outcomes. The relation between children's emotion regulation and their problem behaviours at Time 1, and their peer acceptance at Time 2, was moderated by their ability to take the perspective of others. The current findings would benefit from future research on the simultaneous influence of emotion regulation and emotion understanding on social competence in clinical samples of children, particular those with behavioural problems.

Finally, when examining the influence of emotion regulation and emotion understanding on peer acceptance, there was remarkable stability in children's peer rated social preference from Kindergarten to Year 1. In fact, the single best longitudinal predictor of children's peer preference was their peer preference one year earlier. This finding, together with the independence of emotion regulation and emotion understanding has broad implications for interventions to improve children's social competencies and peer relationships. First, it appears that if improvements to social competence are to be made, it is especially important to work on children's abilities to manage their emotional response, especially in light of the finding that deficits in emotion regulation, not emotion understanding, contribute to children's problem behaviours, both concurrently and longitudinally. To be most effective, however, given the importance of both domains of emotional competence for social adaptation, intervention programs should aim to target both a child's understanding of emotion and their regulation of emotional arousal. Second, it appears that when it comes to children's peer preference it is very hard to change peer perceptions, regardless of emotional competence. Thus, if improvements are to be made to a child's emotion regulation and emotion understanding, then they must co-occur with a change in the child's context as well.

### 10.3 Conclusions

Three key conclusions may be drawn from the current thesis. First, the degree to which children manage their attention to emotionally challenging events has reaching implications for their social adaptation, both concurrently and longitudinally (Calkins, et al., 1999; Eisenberg, et al., 2004; Kopp, 1989). Those children who disengaged least when faced with challenging content were likely to be rated as socially competent and, furthermore, were more socially accepted by their peers. Second, there has been some confusion in the literature regarding the nature of affective empathy and its relation to social adaptation (Cole, et al., 1996; Eisenberg & Fabes, 1995; Miller, et al., 1996; Strayer, 1993). In the current study, there was a high degree of independence between children's expressions of worry-concern and sadness when faced with an empathy inducing event, and these affective responses were uniquely associated with behavioural and physiological measures of emotion regulation, in addition to social adaptation in Kindergarten. Finally, there was a high degree of independence between the manner in which children experience emotion and their understanding of emotion; moreover, these components of emotional competence were independently related to children's social competence both concurrently and longitudinally.

As stated in Chapter 1, there is a complicated story to be told about how children manage their responses to challenging events. The data presented in this thesis suggests that an integral component to understanding the meaning of children's behavioural responses within an emotion regulation framework, and the relevance of different behaviours to social adaptation, lies firmly in a close examination of the eliciting context.

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## Appendix A – Ethics Approvals and Associated Forms

### A.1 Human research ethics approval

|  |  |
|--|--|
| <br><b>The University of Sydney</b><br>NSW 2006 Australia | <b>Human Research Ethics Committee</b><br><a href="http://www.usyd.edu.au/ethics/human">www.usyd.edu.au/ethics/human</a><br><b>Senior Ethics Officer:</b><br>Gail Briody<br>Telephone: (02) 9351 4811<br>Facsimile: (02) 9351 6706<br>Email: <a href="mailto:gbriody@usyd.edu.au">gbriody@usyd.edu.au</a><br>Rooms L4.14 & L4.13 Main Quadrangle A14 |
|  | <b>Human Secretariat</b><br>Telephone: (02) 9036 9309<br>(02) 9036 9308<br>Facsimile: (02) 9036 9310   |

17 May 2007

Dr M de Rosnay  
School of Psychology  
Brennan MacCallum Building – A18  
The University of Sydney

Dear Dr de Rosnay

Thank you for your correspondence received on **30 April 2007** addressing comments made to you by the Human Research Ethics Committee (HREC). After considering the additional information, the Executive Committee at its meeting on **16 May 2007** approved your protocol entitled **“Fitting In and Making Friends: The Socio-Cognitive Underpinnings of Young Children’s Adaptation to a New School Environment”**.

Details of the approval are as follows:

|                              |                                     |
|------------------------------|-------------------------------------|
| <b>Ref No.:</b>              | <b>05-2007/9936</b>                 |
| <b>Approval Period:</b>      | <b>May 2007 to May 2008</b>         |
| <b>Authorised Personnel:</b> | <b>Dr M de Rosnay<br/>Ms E Fink</b> |

The HREC is a fully constituted Ethics Committee in accordance with the *National Statement on Ethical Conduct in Research Involving Humans-June 1999* under Section 2.6.

The approval of this project is **conditional** upon your continuing compliance with the *National Statement on Ethical Conduct in Research Involving Humans*. We draw to your attention the requirement that a report on this research must be submitted every 12 months from the date of the approval or on completion of the project, whichever occurs first. Failure to submit reports will result in withdrawal of consent for the project to proceed.

**Special Condition of Approval**

Please provide a copy of the approval letter from the Department of Education and Training, when available.

**Chief Investigator / Supervisor’s responsibilities to ensure that:**

- (1) All serious and unexpected adverse events are to be reported to the HREC as soon as possible.
- (2) All unforeseen events that might affect continued ethical acceptability of the project are to be reported to the HREC as soon as possible.

- (3) The HREC must be notified of any changes to the protocol. All changes must be approved by the HREC before continuation of the research project. These include:-
  - If there are any changes to investigators (e.g. Leaving the University)
  - Any changes to the Participant Information Statement and/or Consent Form.
- (4) All research participants are to be provided with a Participant Information Statement and Consent Form, unless otherwise agreed by the Committee. The Participant Information Statement and Consent Form are to be on University of Sydney letterhead and include the full title of the research project and telephone contacts for the researchers, unless otherwise agreed by the Committee and the following statement must appear on the bottom of the Participant Information Statement. *Any person with concerns or complaints about the conduct of a research study can contact the Senior Ethics Officer, University of Sydney, on (02) 9351 4811 (Telephone); (02) 9351 6706 (Facsimile) or [gbriody@usyd.edu.au](mailto:gbriody@usyd.edu.au) (Email).*
- (5) The HREC approval is valid for four (4) years from the Approval Period stated in this letter. Investigators are requested to submit a progress report annually.
- (6) A report and a copy of any published material should be provided at the completion of the Project.

Yours sincerely



**Associate Professor J D Watson**  
**Chairman**  
**Human Research Ethics Committee**

cc Ms Elian Fink, School of Psychology, Brennan MacCallum Building – A18, The University of Sydney

Encl.  
Parental/Guardian Information Statement

## A.2 Approval to conduct research in schools of the archdiocese of Sydney



# Catholic Education Office, Sydney

38 RENWICK STREET, LEICHHARDT NSW • PO BOX 217, LEICHHARDT 2040 • PH (02) 9589 6111 • FAX (02) 9550 0052

13<sup>th</sup> April 2007

Dr Marc de Rosnay  
School of Psychology, University of Sydney  
SYDNEY NSW 2006

Dear Marc,

Thank you for your application to conduct research in Catholic systemic schools in the Archdiocese of Sydney. Approval is given by CEO Sydney to conduct this study.

Permission is given for you to approach the Principal of the school nominated, listed below, requesting participants for your study: **"FITTING IN AND MAKING FRIENDS: THE SOCIO-COGNITIVE UNDERPINNINGS OF CHILDREN'S ADAPTATION TO A NEW SCHOOL ENVIRONMENT"**

|   |                             |
|---|-----------------------------|
| <i>St Paul of the Cross Primary, Dulwich Hill</i> | <i>Ms Cathy Young</i>       |
| <i>Our Lady of Lourdes Primary, Earlwood</i>      | <i>Ms Maria Ross</i>        |
| <i>St Pius Primary, Enmore</i>                    | <i>Mrs Cathie Blinman</i>   |
| <i>St Mary's Primary, Erskenville</i>             | <i>Ms Beverly Coffey</i>    |
| <i>St Joan of Arc Primary, Haberfield</i>         | <i>Miss Margaret Woods</i>  |
| <i>St Fiaches Primary, Leichhardt</i>             | <i>Miss Julie Conway</i>    |
| <i>St Columbas Primary, Leichhardt North</i>      | <i>Miss Dianne Monaghan</i> |
| <i>St Brigids Primary, Marrickville</i>           | <i>Mrs Lynette Sandford</i> |
| <i>St Michael's Primary, Stannmore</i>            | <i>Miss Diane Nilon</i>     |
| <i>St Patrick's Primary, Summer Hill</i>          | <i>Mrs Colleen Adams</i>    |

As you no doubt appreciate, it is the prerogative of any Principal whom you might approach to decline your invitation to be involved in this study or to withdraw from involvement at any time. Also, as you have outlined, written parental permission is required for any child to participate in the study.

The privacy of the school and that of any school personnel or students involved in your study must, of course, be preserved at all times and comply with requirements under the Commonwealth Privacy Amendment (Private Sector) Act 2000.

When you have established your participating schools, please complete the attached form and return it to this office. It is a condition of approval that when your research has been completed you will forward a summary report of the findings and/or recommendations to this office as soon as practicable after results are to hand.

As this research involves contact with students, you will be required to complete a "working with children" check. A copy of this document has been attached. As a condition of approval, please send a copy of the University Ethics Approval in addition to the completed screening consent form and return in the enclosed reply paid envelope so that a background check can be undertaken.

Please do not hesitate to contact me at this office if there is any further information you require. I wish you well in this undertaking and look forward to learning about your findings.

Yours sincerely,

**Christopher Barrett**  
Education Officer, Human Resources  
on behalf of  
Br Kelvin Canavan fms  
EXECUTIVE DIRECTOR OF SCHOOLS

### A.3 Parental Information Letter



**The University of Sydney**

**Faculty of Science  
School of Psychology  
NSW 2006 Australia**

**Marc de Rosnay *DPhil*  
Australian Postdoctoral Fellow  
Lecturer**

Brennan MacCallum Building A18  
Telephone +61 2 9351 4528  
Facsimile +61 2 9351 5223  
marcd@usyd.edu.au

#### Parental/Guardian Information Statement

#### **Fitting in and making friends: The socio-cognitive underpinnings of young children's adaptation to a new school environment**

**(1) What is the study about?**

This research aims to better understand how children adapt to a new school environment by assessing the ways in which they are capable of understanding others, make new friends and interact with their peers. Outside the family, young children's most important social environment is their classroom and if they are able to fit in at school and make friends then they are less likely to be socially excluded in the future, have behavioural disturbances and experience school failure. This is a study of typical development that will give us a better model for understanding other children with social and behavioural problems or disabilities in the future.

**(2) Who is carrying out the study?**

This study is being conducted by Dr. Marc de Rosnay, an Australian Postdoctoral Fellow and Lecturer in the School of Psychology at the University of Sydney.

**(3) What does the study involve?**

To study children's friendships effectively, it is necessary to follow the development of the same children over time, and to have a window on their functioning within the classroom. As such, this research aims to follow a group of children during their first three years at school. Brief assessments of your child will be made in four domains: (i) language development, (ii) friendship interactions, (iii) empathetic responding to the emotions of others, and (iv) socio-cognitive understanding, at two or three separate time-points. These tasks have been used with children many times before and they usually enjoy doing them very much. In addition, children will engage in some collaborative play tasks so that we can observe how they negotiate an ordinary play situation with their peers. Assessments will take place during Kindergarten, Year 1 and Year 2 at times nominated by your child's teacher. Video and audio recordings of your child will be made as part of this study. These recordings will only be accessible to the investigator of this study. These recordings will be used only for the purpose of research and your child's identity will be protected (see point 6 below).

This study also involves a small element of parent participation. Parents are requested to complete two short questionnaires regarding their child's behaviour.

*If you would like further information about the procedures outlined here, please do not hesitate to contact Dr Marc de Rosnay (see point 8 below).*

*Fitting in and making friends*

**(4) How much time will the study take?**

The assessments of your child will take about 40 to 50 minutes at a given time-point, inclusive of the collaborative play task. We anticipate that both parental questionnaires will take approximately 15 minutes to complete.

**(5) Can I withdraw from the study?**

Participation is voluntary and your child will take part only if you give consent. Your decision whether or not to permit your child to participate will not prejudice you or your child's future relations with the University of Sydney. If you decide to permit your child to participate, you are free to withdraw your consent and to discontinue your child's participation at any time without jeopardising you or your child's relationship with the University of Sydney or the school. In addition, because of your child's age, the teacher and/or researcher will terminate any aspect of the study if they have any concern about your child's welfare, although this is not at all expected to occur.

**(6) Will anyone else know the results?**

All aspects of the study, including results, will be strictly confidential and only the researchers will have access to information about participants. A report(s) of the study may be submitted for publication and the findings presented at national and international conferences related to this area of research, but individual participants or schools will not be identifiable in such a report(s)

**(7) Will the study benefit me or my child?**

We do not anticipate that there will be any adverse consequences for your child by taking part in our study. There is some evidence, in fact, that children benefit from doing the tasks described above but we cannot give any assurances that your child will receive any benefits from the study.

If you wish, we will happily provide you and your child with a DVD recording of your child's participation in this study. We cannot, however, provide you with recording of any other child.

**(8) What if I require further information?**

If you have any questions about the study or require further information you are welcome to contact Dr. Marc de Rosnay on (02) 9351 4528 (telephone) or [marcd@psych.usyd.edu.au](mailto:marcd@psych.usyd.edu.au) (email). This information sheet is for you to keep.

**Any person with concerns or complaints about the conduct of a research study can contact the Senior Ethics Officer, Ethics Administration, University of Sydney on (02) 9351 4811 (telephone), (02) 9351 6706 (facsimile) or [gbrody@usyd.edu.au](mailto:gbrody@usyd.edu.au) (email).**

Yours sincerely,



Marc de Rosnay, PhD  
School of Psychology,  
The University of Sydney  
Sydney, 2006

**A.4 Child Consent Form**



**The University of Sydney**

**Faculty of Science  
School of Psychology  
NSW 2006 Australia**

**Marc de Rosnay *DPhil*  
Australian Postdoctoral Fellow  
Lecturer**

Brennan MacCallum Building A18  
Telephone +61 2 9351 4528  
Facsimile +61 2 9351 5223  
marcd@usyd.edu.au

Parental/Guardian Consent Form

**Fitting in and making friends: The socio-cognitive underpinnings of young children's adaptation to a new school environment**

I (*print name*) ..... agree to permit my child (*print name*)..... who is aged .....years, to participate in the study described in the Parental Information Statement attached to this form.

1. I acknowledge that I have read the Parental Information Statement, which explains the aims of the experiment and the nature and possible risks of the research, and the study has been explained to me to my satisfaction.
2. I have been given the opportunity of asking questions relating to any possible physical and mental harm my child might suffer as a result of participation and I have received satisfactory answers to any questions that I have asked.
3. I have discussed participation in the project with my child and my child assents to their participation in the project
4. I understand that my child's participation in this research is voluntary and I can withdraw my child from the experiment at any time without prejudice to my own or the child's relationship with the University of Sydney or the child's school.
5. I agree that research data gathered from the results of the study may be published, provided that neither I nor my child can be identified.
6. I understand that if I have any questions relating to my child's participation in this research, I may contact Dr. Marc de Rosnay on telephone (02) 9351 4528, or email marcd@psych.usyd.edu.au, who will be happy to answer them.
7. I acknowledge receipt of a copy of this Consent Form and the Information Statement.

\_\_\_\_\_  
Signature of Parent/Guardian

\_\_\_\_\_  
Date

\_\_\_\_\_  
Please PRINT name

## Appendix B Child Behaviour Coding Scheme

### B.1 Coding Manual

This manual provides guidelines for classifying children's behaviour and affect during emotionally evocative vignettes. The coding scheme was based upon the current literature which explores infant's and young children's behavioural responses to distress (e.g., Diener & Mangelsdorf, 1999; Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002; Grolnick, Bridges, & Connell, 1996).

Children's behavioural strategies and affect were coded continuously during each of the 8 vignettes. Facial expressions served as an indicator of children's outward emotional responding, and were based upon the *AFFEX* system (Izard, Dougherty, & Hembree, 1983), with the addition of the facial code of concern (see Cole, Zahn-Waxler, Fox, Usher, & Welsh, 1996; Hastings, Zahn-Waxler, Usher, Robinson, & Bridges, 2000). The majority of behavioural codes may be assessed independently (more than one behaviour may occur simultaneously). When behaviours are mutually exclusive it is noted in the coding scheme. Only one facial expression may be coded at a given time.

#### Disengagement

Disengagement codes include all instances when the child's attention shifted away from the video vignette. Disengagement comprised of the functionally related behaviours of gaze avoidance, head avoidance and distraction, as is typical of the literature examining behavioural responses to distress (e.g., Rothbart, Ziaie, & O'Boyle, 1992). The following three codes for disengagement are mutually exclusive.

*Gaze Avoidance*: involves shifting attention with the eyes whilst keeping the head stationary (see Figure B.1).

*Head Avoidance*: involves any instance of shifting attention using the whole head (e.g., look away, look down, turn head) (see Figure B.2).

*Distraction*: this code was used when the child initiates a novel coherent activity and the direction of the child's gaze was clearly focussed onto the new activity, for example, playing with unrelated objects.



Figure B.1. Head avoidance



Figure B.2. Gaze avoidance

### Agitative Activity

Agitative activity includes all instances of children's movements that have an agitative quality. As such, this code does not include gross body movement such as shifting position or relaxed/smooth movements of the hand or arm. Movements that were not classified as agitation typically occurred in a fluid and calm manner. Gaze did not have to be fixed for agitation to be coded and, as such, may be mixed with disengagement. A fine-grained definition of agitation was adopted and included separate codes for minor and gross agitation. Gross and minor agitation could be coded simultaneously.

*Gross agitative activity:* was defined by the body but also included any movement of the arms, shoulders and head; for example leg shaking, restless bouncing in chair.

*Minor agitative activity:* includes movements of the hands, such as nervous movements with the hands and/or fingers (e.g., finger tapping), nervous self-touching with the hands (e.g., of the face and hair) and fidgeting. Minor agitation includes movement of hand to face, but if the movement specifically involved manipulation of the mouth it was coded as mouthing behaviour.

*Mouthing:* Mouthing was defined by any manipulation of the mouth, or mouthing movements, and included both mouthing without and with fingers in the mouth (see figure B.3 and B.4). Truncated mouthing expressions and tension were also scored as mouthing. Typically mouthing included irregular manipulation of the mouth with the hands or tongue, licking of lips, tongue and lip movements. In addition, grimaces were included in the mouthing code. A grimace comprised

unusual or contorted mouth movements and were distinct from mouthing in that they were typically unmoving contortions of the mouth as opposed to repetitive manipulations of the mouth.



Figure B.3. Mouthing using tongue and lips



Figure B.4. Mouthing with hands

### Self-soothing Behaviours

Self-soothing behaviours were determined by their repetitive quality and, as such, were persistent behaviours. Self-soothing included *repetitive* manipulation of

the mouth with the hands or tongue, licking of lips, tongue and lip movements, and thumb-sucking, as well as non-mouth related movements such as hair twirling or repetitive stroking. Self-soothing and mouthing behaviours, although similar, were distinct codes. Mouthing behaviour comprised irregular manipulations of the mouth (and were relatively short in duration) while self-soothing behaviours included repetitive and steady mouth manipulations, were typically of longer duration and had a conceivable soothing quality. Self-soothing behaviours were sometimes preceded by a mouthing code, and it was, in certain cases, difficult to distinguish when mouthing behaviours ceased with self-soothing behaviour began. There was a very little self-soothing behaviour in the current sample, thus, self-soothing behaviours will not be discussed further.

#### Verbal Communicative Bids

Children's verbalisations were divided into discrete comments, when a comment was on a distinct topic but contained numerous clauses it was scored as one verbalisation (e.g., there are train tracks. I can see train tracks). The content of children's verbal communicative bids were coded as follows (adapted from Slomkowski & Dunn, 1996):

*Connected comments:* included comments, interpretations or questions about the content of the vignette (e.g., I think she's lost). This code includes comments or questions that refer to the mental state of the characters in the vignette and those comments that take into account feeling states (e.g., that's a sad baby), desires (e.g., he doesn't like school) or interpretations of mental state (e.g., I think it wants its teddy bear). Comments that provide an insight into the child's own response to or judgement of the vignettes (e.g., I really want that to stop; that boy is rude, he whacked the girl) or statements referring to the child's own experience (e.g., I cried a little bit then I stopped on my first day of school) were included in this code.

*Inappropriate comments:* included any comments or questions that were unrelated to the content of the vignettes, such as comments or question about the procedure (e.g., what are we doing at the end of the video) or the materials being

used (e.g., so why do we need these on?) or generally unrelated (e.g., I've got glue in my mouth). Comments that demonstrate the child's lack of understanding of the content of the vignettes (e.g., it's funny) or are irrelevant to the content of the vignettes (e.g., I'm six years old) were also given this code.

### Affect

Facial expressions served as an indicator of children's outward emotional responding, and were based upon the AFFEX coding system (Izard et al., 1983). Anger, fear, joy and sadness expressions were coded according to the detailed criteria set out in the AFFEX system. This was supplemented by the inclusion of the facial expression of worry-concern and postural sadness. All expressions of affect are mutually exclusive.

*Anger:* Lips pressed together, mouth appears tense; eyelids tighten or narrow, inner corners of brow lowered; cheeks may be raised.

*Fear:* Entire brow raised; eyes appear wider and tense; lip corners are drawn back.

*Joy:* Lip corners raised; cheeks raised; crinkling around eyes, eyes may be squinted. Anxious smiles were not coded as joy (Eisenberg et al., 1988).

*Sadness*: Inner corner of brow raised; cheeks are lowered, or raised with squinted eyes; lip corners drawn down, bottom lip may be pushed outwards (see Figure B.5).



Figure B.5. Typical sad expressions, including sad mouth (top left image)

*Worry-Concern*: Brows are lowered; eyes appear wide or may be squinted with raised cheeks; can include both scanning and focused eyes; mouth may be open (Cole et al., 1996; Hastings et al., 2000). This has previously been coded as concerned-attention (Eisenberg & Fabes, 1990; Gurthrie et al., 1997; Miller, Eisenberg, Fabes, & Shell, 1996), interest-worry (Cole et al., 1996) and interest (Izard, 1979). When this expression has been previously coded (e.g., Cole et al., 1996; Eisenberg et al., 1988) it is considered suggestive of children's attempts to inhibit responsively and therefore taken as a modulated or controlled expression. In the current study, the majority of children exhibiting worry-concern did so intensely (see Figure B.6).



Figure B.6. Typical worry-concern expressions

*Postural Sadness:*

*This is a code that is very difficult to capture with stills so video footage can be provided by the author.*

Postural sadness is characterised by a postural droop, such as a slight slump, drop of the head and slump of the shoulders and was often accompanied by passive downcast mouth and blank gaze. Often there is an absence of movement, and thus often appears as low level fear with depressed affect (see Figure B.7). In the case that the child displays both postural sadness and a sad expression only sad expression was coded. Postural sadness has previously been coded in infants as 'bodily sadness' by Goldsmith and Rothbart (1999).



*Figure B.7. Progression of postural sadness*

## **B.2 Reliability**

Reliability for behavioural code was calculated within the Observer program. In order to calculate the number of agreements and disagreements between raters, Observer analyses each pair of observations over a number of runs (Noldus, 2008).

First, the program searches for behavioural codes of the same kind that overlap in time across the two observations. Second, matches between codes within the tolerance window are found. In Observer, a tolerance window defines how accurate the timing of an event must be to be considered an agreement or not. On the basis of a preliminary reliability analysis it was decided that observation points within 2 seconds of each other should be counted as the same point. Thus, the window of accuracy between the two raters coding of the onset and offset of behaviours was 2 seconds. These first two reliability runs determine the number of time-locked behavioural code agreements across the raters.

The final three runs examine disagreements across raters. Any coded behaviours that have not been matched across raters both outside and inside the specified tolerance window are found and recorded as a disagreement. This results in a total number of agreements and disagreements for each behavioural code. Cohen's kappa, an overall measure of agreement that is corrected for agreement by chance, is then calculated based on the observed proportion of agreements (Cohen, 1960). Cohen's kappa for each behavioural code is reported in Chapter 3 (Study 1) and Chapter 4 (Study 2).

Where there were disagreements between coders, discrepancies in the coding were identified and reviewed with discussion. Often this involved observing the child's behaviour at points before and after the disagreement in order to become familiar with the individual child's characteristic manner of responding, this was especially important when resolving disagreements concerning agitative activity. In the few instances where an agreement could not be reached, videos were reviewed by a third experienced coder. Once a resolution was reached, behavioural codes were corrected for each disagreement and this final coding was used in the subsequent analyses. The primary rater then went on to code the remainder of the sample.

## Appendix C – Teacher and Child Measures

### C.1 Social Skills Rating System (Gresham & Elliot, 1990)

#### Social Skills

---

1. Controls temper in conflict situations with peers. (S)
  2. Introduces herself or himself to new people without being told. (A)
  3. Appropriately questions rules that may be unfair. (A)
  4. Compromises in conflict situations by changing own ideas to reach agreement. (S)
  5. Responds appropriately to peer pressure. (S)
  6. Says nice things about himself or herself when appropriate. (A)
  7. Invites others to join in activities. (A)
  8. Uses free time in an acceptable way.(C)
  9. Finishes class assignments within time limits. (C)
  10. Makes friends easily. (A)
  11. Responds appropriately to teasing by peers.(S)
  12. Controls temper in conflict situations with adults. (S)
  13. Receives criticism well. (S)
  14. Initiates conversations with peers. (A)
  15. Uses time appropriately while waiting for help. (C)
  16. Produces correct schoolwork. (C)
  17. Appropriately tells you when he or she thinks you have treated him or her unfairly. (A)
  18. Accepts peers' ideas for group activities. (S)
  19. Gives compliments to peers. (A)
  20. Follows your directions. (C)
  21. Puts work materials or school property away. (C)
  22. Cooperates with peers without prompting. (S)
  23. Volunteers to help peers with classroom tasks. (A)
  24. Joins ongoing activity or group without being told to do so. (A)
  25. Responds appropriately when pushed or hit by other children. (S)
  26. Ignores peer distractions when doing class work. (C)
  27. Keeps desk clean and neat without being reminded. (C)
  28. Attends to your instructions. (C)
  29. Easily makes transition from one classroom activity to another. (C)
  30. Gets along with people who are different. (S)
- 

C = Cooperation subscale; A = Agreeableness subscale; S = Self-control subscale

**Problem behaviours**

---

1. Fights with others. (E)
2. Has low self-esteem. (I)
3. Threatens or bullies others. (E)
4. Appears lonely. (I)
5. Is easily distracted. (H)
6. Interrupts conversations of others. (H)
7. Disturbs ongoing activities. (H)
8. Shows anxiety about being with a group of children. (I)
9. Is easily embarrassed. (I)
10. Doesn't listen to what others say. (H)
11. Argues with others. (E)
12. Talks back to adults when corrected. (E)
13. Gets angry easily. (E)
14. Has temper tantrums. (E)
15. Likes to be alone. (I)
16. Acts sad or depressed. (I)
17. Acts impulsively. (H)
18. Fidgets or moves excessively. (H)

---

E = Externalising subscale, I = Internalising subscale, H = Hyperactivity subscale

**C.2 Social Maturity Scale** (Peterson, Slaughter & Paynter, 2007)

- 1 very much less mature than the average child of this age
- 2 less mature than the average child of this age
- 3 a little less mature than the average child this age
- 4 about average for a child this age
- 5 a little more mature than the average child this age
- 6 more mature than the average child this age
- 7 very much more mature than the average child this age

- 
1. The child's skill and willingness to make social overtures, join groups, or welcome others into own activities
  2. The child's skill at asserting him/herself appropriately to express opinions or convince peers.
  3. The child's leadership skills with peers.
  4. The maturity of the child's everyday modes of playing sociably with peers.
  5. The child's skills for coping with peers who frustrate or interfere with the group's goals and activities
  6. The child's ability to understand the needs and interests of peers who differ from the norm
  7. The overall maturity of the child's social skills
- 

**C.3 Teacher-rated Impulsivity Scale** (White, Moffitt, Caspi, Bartusch, Needles, & Stouthamer-Loeber, 1994)

- 
1. Fails to finish thing he/she starts
  2. Is impulsive or acts without thinking
  3. Demands must be met immediately
  4. Talks out of turn
  5. Wants to have things right away
  6. Is impatient
-

**C.4 Theory of Mind Tasks** (Perner, Leekman & Wimmer, 1987; Wimmer & Perner, 1982)

i. Unexpected Contents

*Here is a box of Pringles. What do you think is inside the box?*

*Let's have a look inside the box Can you tell me what is really inside the box?*

*That's right! There are crayons inside the box. Now, put the lid back on so the box is closed.*

*Here's Lily. Lily has never seen inside this box of Pringles before.*

**Target question:** *What does Lily think is inside the box?*

**Reality question:** *What's really inside the box?*

ii. Unexpected Transfer

*This is Luke. Luke has a ball and a pink box.*

*Luke puts his ball into the pink box to keep it safe and then he goes to play.*

*While Luke is outside playing, Sean decides to surprise him. Sean takes the ball out of the pink box and puts it inside the blue box. Then he goes outside to play.*

*Luke comes back because he wants to play with his ball.*

**Target question 1:** *Where will Luke look for his ball?*

**Target question 2:** *Okay, where does Luke think his ball is before looking for it?*

**Reality question:** *Okay, where is the ball really?*

**C.5 Test of Emotion Comprehension** (Pons, Harris & de Rosnay, 2004)

Component III: Diverse Desires

*This is Tom and this is Peter. Tom and Peter are very thirsty.*

*Tom likes Coca-Cola a lot, and Peter hates Coca-Cola.*

**Control question 1:** does Tom like Coca-Cola [point left]?

**Control question 2:** Does Peter like Coca-Cola [point right]?

*Now, let's open the box. There's Coca-Cola in the box!*

**Target Question 1:** *Now, Tom is thirsty. How does Tom feel when he sees the Coca-Cola?*

**Target Question 2:** *Peter is also thirsty. How does Peter feel when he sees the Coca-Cola?*

Component IV: Ignorance-Based Emotion

*This is Jack. Jack is at home all by himself. Jack doesn't like staying all by himself.*

*Can you look behind the chair? It's Jack's best friend! He is hiding behind the chair because he wants to surprise Jack. Can you put the chair back so that Jack can't see his friend?*

**Reality question:** *Does Jack know that his friend is hiding behind the chair?*

**Target question:** *How is Jack feeling? Is he feeling happy, just alright, angry or scared?*

Component VII: Control of Emotional Expressions

*This is Anna and this is Lucy. Anna is teasing Lucy because Anna has lots of marbles and Lucy doesn't have any!*

*Lucy tries to hide how she feels inside. She doesn't want Anna to know how he feels inside.*

**Target question:** *How is Lucy really feeling inside?*

Component IV: Belief-Based Emotion

1. *This is Molly. Molly's mother has given her a packet of lollies. Molly loves to eat lollies! Molly puts her packet of lollies on the table and goes for a walk.*
2. *While Molly is outside, Jessica decides to play a trick on her.*
3. *Jessica takes all the lollies out of the packet...*
4. *and replaces them with beans!*
5. *Then Jessica puts the packet back on the table just as Molly left it.*

**Control Question 1:** *Does Molly like lollies?*

**Control Question 2:** *What's really in the packet?*

6. *Molly comes back from her walk and she's very hungry. She sees her packet of lollies on the table.*

**Target-emotion question:** *how does Molly feel when she first looks at the packet of lollies on the table but before she eats some food from it?*

**Target FB Question:** *What does Molly think is inside the packet before she opens it?*

**C.6 Empathy Continuum** (Strayer & Roberts, 1992, 2004)

Protocol

After viewing the emotion elicitation vignettes, the following questions were asked for vignette 3, 5, 7 and 8:

**Memory Check:** *Can you tell me what happened during this story?* [Showing image from the vignette]

**1. Self-reported emotion:** *Did you feel anything while watching this story?*

**Intensity of self-reported emotion:** *Did you feel [emotion] a little or a lot?*

**2. Self-reported emotion justification:** *Why did you feel [emotion]?*

**3. Protagonist emotion:** *How do you think [protagonist] felt during the story?*

**Intensity of protagonist emotion:** *Do you think he/she felt [emotion] a little or a lot?*

Coding Scheme

**Self-reported Emotion Justification**

1 = no response/don't know

2 = no attribution, or irrelevant attribution for own emotion (e.g., "I just didn't like it.")

3 = attribution based on events only (e.g., "I was scared of that creepy house.")

4 = attribution refers to a character's specific situation (e.g., "I was scared when he went up that house.")

5 = attribution indicates transposition of self into situation and/or association with own experience (e.g., "Scared – I wouldn't hang around with a guy like that")

6 = attribution indicates responsiveness to character's internal state (feelings, thoughts) or general life situation (e.g., "I was sad because she felt so put down"; "...happy she could accept her handicap so well"; "...sad because a child shouldn't be mistreated.")

7 = attribution indicates semantically *explicit* role taking (e.g., "If I were her, I'd feel just as angry at him.")

**Appendix D – Confirmatory Factor Analysis for Social Maturity**

At both Time 1 and Time 2, there were significant concurrent positive correlations among the social maturity items, Time 1:  $r$ s range = .73 - .91,  $p < 0.01$ , Time 2:  $r$ s range = .79 - .94,  $p < 0.01$ , as well as significant longitudinal correlations among the 7 items,  $r$ s range = .27 - .55  $p < 0.05$ . These significant correlations both within and across time suggest that all seven social maturity items may be used as indicators to model a latent factor for social maturity at each time point.

A model was specified where all seven items loaded onto a single latent variable at each time-point (see Figure D.1). The latent factor for social maturity at Time 1 and Time 2 were permitted to be correlated. The error variances of item 2 and item 3 were correlated at each time. The model was over-identified with 74  $df$  and  $\chi^2 = 151.60$ ,  $p < 0.05$ . The remaining overall goodness-of-fit indices, however, suggest largely an adequate to good model fit: SRMR = 0.04, RMSEA = 0.10, CFI = 0.97 and TLI = 0.86. Unstandardised and completely standardised parameter estimates from this solution are presented in Figure 8.1. All parameter estimates were statistically significant,  $p < 0.01$ . The latent social maturity variables explained a significant amount of variance in all 7 indicators at both time-points; Time 1:  $R^2$  mean = 0.84, range = .76 - .93,  $p < 0.01$ , Time 2:  $R^2$  mean = 0.85, range = 0.75 - .95,  $p < 0.01$ . There was significant variance in both Time 1 and Time 2 social maturity latent factors, and these factors were significantly correlated.

Overall, examining both fit indices and parameter estimates, modelling a latent construct of social maturity across the 7 items at each time-point provides a good fit to the data.

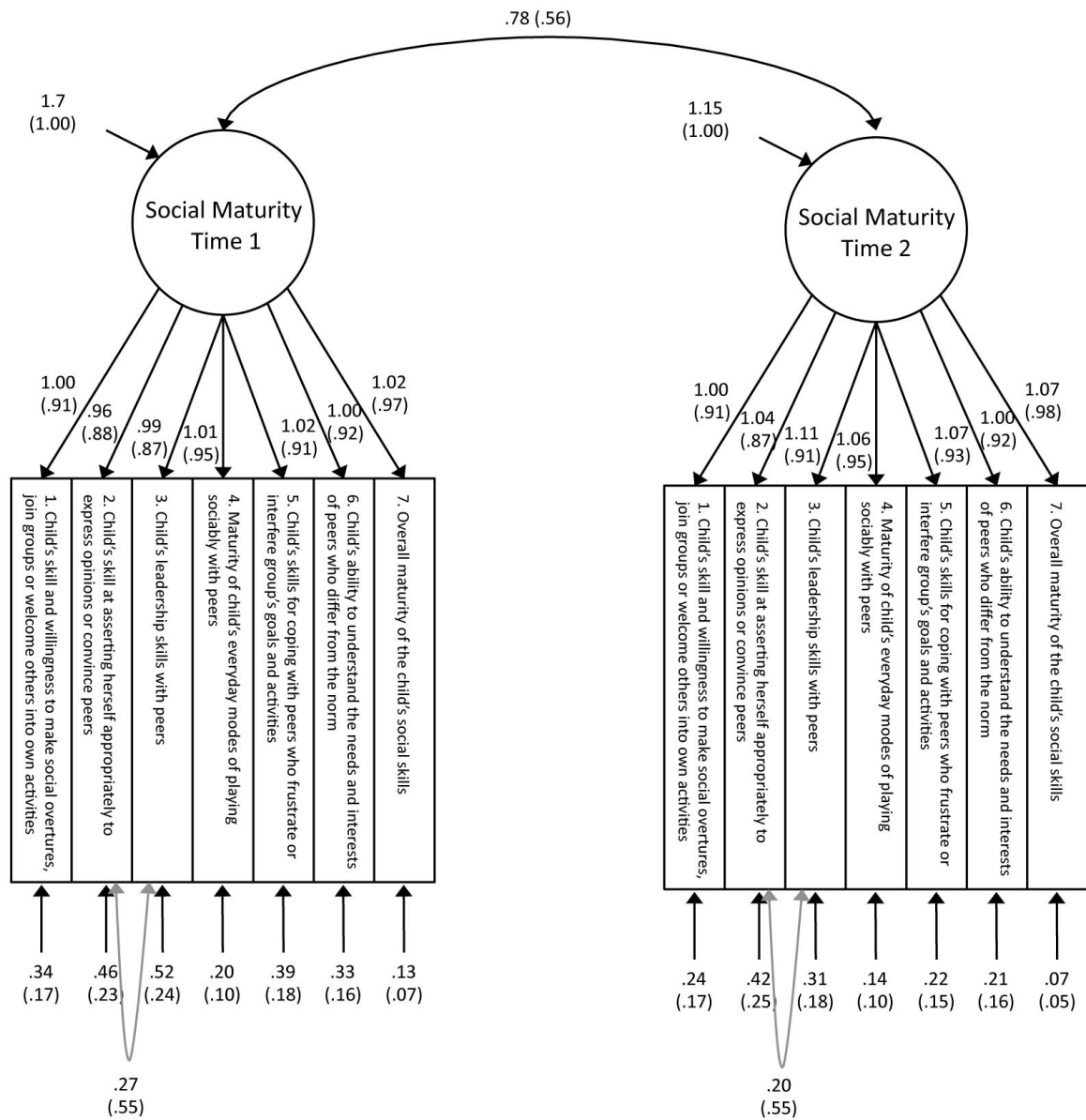


Figure D.1. Unstandardised and completely standardised parameter estimates from the CFA model of the seven items from the Social Maturity scale at Time 1 and Time 2. Completely standardised parameter estimates are presented in parentheses. All freely estimated parameter estimates are statistically significant,  $p < 0.01$ .