THE UNIVERSITY OF SYDNEY

The Relationship between Emotional Intelligence and Emotion Regulation

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Statement of Originality

This is to certify that to the best of my knowledge, the content of this thesis is my own work. This thesis has not been submitted for any degree or other purposes.

I certify that the intellectual content of this thesis is the product of my own work and that all the assistance received in preparing this thesis and sources have been acknowledged.

Ethical Approval

The study from Chapter 3 presented in this thesis was carried out in accordance with the National Statement on Ethical Conduct in Human Research (2007) and received ethical approval from The University of Sydney Human Research Ethics Committee(s) prior to their commencement under protocol 2019/372.

Author Attribution Statement

Chapter 3 of this thesis presents a paper in press as [Xiao, H., Double, K. S., Walker, S. A., Kunst, H., MacCann, C. (in press). Emotional intelligent people use more high-engagement and less low-engagement processes to regulate others' emotions. *Journal of Intelligence*.]. I interpreted the analysis done by Associated Professor Carolyn MacCann and wrote the manuscript under the guidance of her. Feedback on the final manuscript was provided by all co-authors.

He Xiao, 28th September 2022.

As supervisor for the candidature upon which this thesis is based, I can confirm that the authorship attribution statements above are correct.

Carolyn MacCann, 28th September 2022.

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Abstract

The thesis examines the relationship between emotional intelligence (EI) traits (capacities people have) and emotion regulation processes (things people do) in two studies: a meta-analysis (Study 1) and a cross-sectional study (Study 2). This research is important for understanding the mechanisms by which EI produces positive outcomes. Emotion regulation can either be intrinsic (regulating one's own emotions) or extrinsic (regulating others' emotions). Study 1 estimates the associations of intrinsic emotion regulation processes with each of the three EI streams (ability EI, self-rated EI, and mixed EI), comparing the lower-level branches of ability EI (i.e., emotion perception, use, understanding, and management). As there are relatively few studies on extrinsic emotion regulation, Study 2 looks at the associations between ability EI and extrinsic emotion regulation. Chapter 1 introduces background theory on EI and emotion regulation. Chapter 2 presents a meta-analysis (n = 67 studies, k = 618 effects) on EI and intrinsic emotion regulation, and Chapter 3 presents a cross-sectional study (N = 178 undergraduates) on EI and extrinsic emotion regulation. Chapter 4 discusses the overall meaning of results in terms of existing theories of EI an emotion regulation. Results indicated that: 1) emotionally intelligent people tend to regulate their own emotions by either solving the problems (direct situation modification and seeking help) or changing their mindset towards the emotional situations (positive reappraisal); 2) emotionally intelligent people tend to use processes that involve high engagement with others' emotions (reappraisal, receptive listening, and valuing) but not processes that involve low engagement with others' emotions (downward comparison and expressive suppression); and 3) the test formats and theoretical models of EI measures significantly affect the correlations between EI and intrinsic/extrinsic emotion regulation. This thesis contributed to our understandings of associations between EI and intrinsic/extrinsic emotion regulation, as well as the moderating effects of EI stream and EI branch.

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Presentation Format

This thesis presents a combination of not-presently submitted manuscript and an accepted paper. Each chapter is intended to be read both as a stand-alone work and as a continuation of the ideas expressed within this thesis.

CHAPTER 1: Introduction

Individual differences in emotional functioning have been studied as two different traditions: 1) *emotional intelligence* (EI; capacities people have) and 2) *emotion regulation* (things that people do). In this thesis, the two traditions are drawn together to study how the emotional capacities that people have relate to the behaviours that people use to regulate emotions. This thesis aims to examine the associations between EI and the processes people use to regulate their own emotions (intrinsic emotion regulation processes) and others' emotions (extrinsic emotion regulation processes).

The first study of this thesis takes a thorough examination of relationships between emotional intelligence capacities and emotion regulation processes by conducting a meta-analysis (n = 67 papers, k = 618 effects). Because there is very little research on extrinsic emotion regulation, this meta-analysis includes only research on intrinsic emotion regulation. In the second study of the thesis, original empirical research is conducted to link emotional intelligence to extrinsic emotion regulation processes. This cross-sectional study examines how the four major EI abilities relate to eight processes that people use to regulate others' emotions (N = 178 undergraduates).

In the following sections, different conceptualizations of EI and the major theoretical models of emotion regulation are outlined. This thesis considers multiple different streams of EI and the specific components within the ability EI stream (i.e., EI branches) and also considers multiple different processes that people use to regulate their own emotions and those of other people. In addition to the correlations between global EI and intrinsic emotion regulation established in the previous meta-analysis (Peña-Sarrionandia et al., 2015), the present meta-analysis in this thesis examines the effects of the streams (i.e., the three different types of EI—ability EI, self-rated EI abilities, and trait EI) and branches (e.g., underlying parts such as emotion perception, emotion understanding, and emotion

management) of EI on intrinsic emotion regulation. Furthermore, as social relations are components of EI, a cross-sectional study is conducted to study how EI abilities and the specific components of EI (i.e., EI branches) are related to extrinsic emotion regulation. By conducting these two studies, this thesis will extend our understanding about the relationships between EI and emotion regulation: how the streams and branches of EI affect intrinsic emotion regulation, and how EI abilities and EI branches relate to extrinsic emotion regulation.

1.1 Emotional Intelligence (EI)

EI is at the intersect of emotions and intelligence. According to Salovey and Mayer (1990), emotions "typically arise in response to an event, either internal or external, that has a positively or negatively valanced meaning for the individual" (p. 186). Intelligence, as defined by Wechsler (1939), is the overall capacity that an individual has for purposeful action, rational thinking, and effective interactions with the external environment. The conceptualization of EI, as first proposed by Salovey and Mayer (1990), refers to the "appraisal and expression of emotion in oneself and in others, the effective regulation of emotion in self and others, and the use of feelings to motivate, plan, and achieve in one's life" (p. 185). In addition to the Mayer-Salovey definition, different definitions and models of EI have been developed. Measurement models of EI can be categorized into two groups (Mayer, Caruso, et al., 2000): ***ability tests*** and ***rating scales***. Ability tests assess maximum-performance, capturing test takers' emotional knowledge and information processing. Rating scales require test-takers to give ratings of their agreement with statements which reflect their tendency to perform emotion-related behaviours.

Mayer and Salovey (1997) proposed a four-branch definition of EI, that *EI is the ability to perceive, use, understand, and manage emotional information*. This four-branch model is most-commonly measured with an ability test called MSCEIT (Mayer-Salovey-

Caruso Emotional Intelligence Test; Mayer & Salovey, 2002). The four branches are: a) *emotion perception* (the ability to perceive people's emotions through verbal or visual cues); b) *emotion facilitation of thought* (the capacity to generate and use emotions to assist thinking and solving problems); c) *emotion understanding* (the ability to analyse and forecast the development and outcomes of emotions); and d) *emotion management in oneself and others* (reflects the capacity to effectively manage one's own and others' emotions to realize positive outcomes) (Mayer et al., 2004).

In addition to the ability tests of EI, there are also rating scales of EI, which use a variety of different definitions. Some rating scales use the four-branch ability definition of EI (e.g., Self-rated Emotional Intelligence Scale [SREIS; Brackett et al., 2006] and Profile of Emotional Competence [PEC; Brasseur et al., 2013]). Others define EI as a mix of different concepts including character traits and typical ways of behaving in emotional situations. For example, the Bar-On model of emotional-social intelligence (Bar-On, 2006), measured by Emotional Quotient Inventory (EQ-i; Bar-On, 2006), conceptualizes EI as five domains: intrapersonal competence, interpersonal competence, stress management, adaptability, and general mood. Another example is the trait model of EI, measured by the Trait Emotional Intelligence Questionnaire (TEIQue; Petrides & Furnham, 2003), where EI is described as a constellation of emotion-related self-perceived abilities and dispositions (Petrides & Furnham, 2001) with four over-arching dimensions: wellbeing, self-control, emotionality, and sociability. Therefore, the measurement of EI can be categorized based on either the test format (ability tests vs. rating scales) or the theoretical model of EI.

Ashkanasy and Daus (2005) categorized assessments of EI into three different 'streams' based on their theoretical basis and measurement methodology:

1) Stream 1 is referred to as 'ability EI' and is comprised of assessments that are based on the Mayer-Salovey ability definition (the Four-Branch model of EI) and measured

using objective task-based items. For example, a test-taker might be required to decide how much happiness is present in a facial expression of emotion or evaluate the effectiveness of several responses to an emotionally challenging situation. Some tests (such as the MSCEIT) assess all four branches of EI whereas others assess only one of the branches. For example, the Japanese and Caucasian Brief Affect Recognition Test (JACBART; Matsumoto et al., 2000) assesses only the ability to perceive emotions in faces.

2) Stream 2 is referred to as self-rated EI (and sometimes also as 'emotional self-efficacy'). Tests in this stream are self- and peer-report scales based on the Mayer-Salovey definition. This stream includes rating scales based on either the aforementioned four-branch model or the earlier working model of EI (Salovey & Mayer, 1990), where understanding emotions is excluded. The rating scales based on ability model of EI reflect individuals' subjective evaluations of their abilities of perceiving, using, understanding, and managing emotions.

3) Stream 3 rating scales based on other expanded models, which were called 'mixed' models of EI (*mixed EI*). This stream also includes rating scales but based on other models than the four-branch model, including a broader range of emotion-related competencies and personality traits. Therefore, these models were described as 'mixed' because of the broad mix of different concepts included (Mayer, Salovey, et al., 2000). Typical examples are the trait model of EI (Petrides & Furnham, 2001) and Bar-On model of emotional-social intelligence (Bar-On, 2006).

1.2 Emotion Regulation

As summarized by Naragon-Gainey et al. (2017), there are three theoretical models of emotion regulation: 1) temporal process models, which outline four stages in the unfolding process of emotions (temporal process model of emotion regulation; Gross, 1998a); 2) strategy-based models, which focus on the characteristics and correlates of the specific

emotion regulation strategies (e.g., Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2012); and 3) ability-based models, conceptualizing abilities across different emotion regulation processes and situations (e.g., the Difficulties in Emotion Regulation Scale [DERS; Gratz & Roemer, 2004)).

Among the various definitions of emotion regulation, as summarized in Bloch et al. (2010), Gross's (1998a) temporal process model is arguably the most influential one. The temporal process model defined emotion regulation as "processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998a, p.275). When one regulates one's own emotions, it is called *intrinsic* emotion regulation; when one regulates other people's emotions, it is called *extrinsic* emotion regulation (Gross, 2013; Gross & Jazaieri, 2014).

Temporal process model of emotion regulation

The temporal process model of emotion *regulation* is based on a temporal process model of emotion *generation* where emotions occur in a situation-attention-appraisal-response sequence. Emotion regulation may occur at five different stages in this emotion generation sequence (i.e., emotion regulation occurs when one can intervenes to change the course of an emotion as it unfolds over time). The five stages, also referred to as the five families of emotion regulation, including:

Situation selection. This family includes processes involving approaching or avoiding certain people, places, or objects, which will elicit emotions internally or externally. Avoidance, denial, and restraint coping are common processes under this category.

Situation modification. This family includes processes that individuals use to actively implement direct modification to the situation eliciting emotions. Direct situation modification and seeking help are representative processes under this category.

Attention deployment. This family encompasses processes that help direct the attention away from or towards the internal or external factors that elicit emotions. Rumination and Distraction are common processes at this stage.

Cognitive change. This family refers to processes that individuals use to change the way they think towards the situations, in order to change the way that they feel. Acceptance, positive reappraisal, other-blame, and self-blame are representative processes of cognitive change.

Response modulation. This family refers to processes that influence individuals' response tendencies after the emotions have been elicited. Expressive suppression, use of substances, and venting are common processes at this stage.

According to Gross (1998a), the five families of emotion regulation processes can be further categorized into two groups based on whether they occur *before* or *after* the emotions are generated as *antecedent-focused emotion regulation* (situation selection, situation modification, attentional deployment, and cognitive change) or *response-focused emotion regulation* (response modulation). Gross and John (2003) argued that positive reappraisal, a representative process of antecedent-focused emotion regulation, is more effective than expressive suppression, a representative process of response-focused emotion regulation, in decreasing negative emotions. However, Naragon-Gainey et al. (2017) disagreed with a concrete conclusion about the relative effectiveness of antecedent- versus response-focused emotion regulation processes, due to the lack of systematic comparison of other emotion regulation processes from the two categories.

Extrinsic emotion regulation

Extrinsic emotion regulation was defined as "an action performed with the goal of influencing another person's emotion trajectory; it can aim to decrease or increase either negative emotion or positive emotion" (Nozaki & Mikolajczak, 2020, p. 10). As pointed out

by Little et al. (2012) and Reeck et al. (2016), there are similarities between regulating others' emotions and regulating one's own emotions. Therefore, it is reasonable to apply the five families of emotion regulation processes outlined in the temporal process model to extrinsic emotion regulation. In this thesis, the person who regulate others' emotions is referred to as the *regulator*, and the person being regulated as the *target*.

This study considers the eight extrinsic regulation processes identified by MacCann (2022), which were based on Niven et al.'s (2009) classification of interpersonal emotion regulation processes. These eight processes are: *expressive suppression* (encourage the target to avoid expressing their feelings in their face, voice, body language or words), *downward social comparison* (shift the target's frame of reference by comparing their situation to someone who is worse off), *humour* (use humour to make the target feel better—joke or make them laugh), *distraction* (focus the target's attention away from the situation details triggering their emotions), *direct modification* (change the target's situation to alter its emotional impact), *positive reappraisal* (encourage the target to change the way they think about their situation in order to change its emotional impact), *receptive listening* (listen to the target express their emotions in socially shared language), and *valuing* (give the target attention by making them feel valued or special).

The processes differ in the extent to which they involve active engagement with the target person's emotional state (i.e., attending to or deeply processing the target person's thoughts and subjective feelings). Expressive suppression and downward social comparison require only low levels of engagement with the target. The diversion-based processes (distraction and humour) and direct action involve moderate levels of engagement with the target. However, the three remaining processes—positive reappraisal, receptive listening, and valuing—require high levels of engagement with the target person. For reappraisal, the regulator must generate a plausible and effective reinterpretation of events that would help

the target feel better. This involves a high level of understanding and semantic processing. For receptive listening, there is a clear investment of time as well as emotional labour in making the appropriate sympathetic responses. For valuing, the regulator expresses a personal opinion about the importance of the target person, affirming a positive target/regulator relationship involving reliance, trust, and closeness.

1.3 Linking EI to Emotion Regulation: Proposed Research

EI (a set of skills or characteristics that people have) and emotion regulation (a set of things that people do to experience and regulate emotions) are two different but complementary traditions which could be adopted to study emotions (Bucich & MacCann, 2019a). Linking these two traditions may help reveal a mechanism underlying how EI influences one's own and others' emotions (Mestre et al., 2016).

EI and intrinsic emotion regulation: meta-analysis (Chapter 2)

Researchers have argued that EI (characteristics that people have) could exert influence on positive outcomes through the emotion regulation processes that high-EI people use (Peña-Sarrionandia et al., 2015; Zeidner & Hadar, 2014). A previous meta-analysis by Peña-Sarrionandia et al. (2015) found that EI showed a positive association with some emotion regulation processes (e.g., positive reappraisal and direct situation modification) but a negative association with others (e.g., avoidance and rumination). However, there are several limitations of the previous meta-analysis, which 1) only considered the distinctions between ability EI (measured by ability test) and trait EI (measured by rating scales), rather than using the three-stream conceptualization of EI assessments, and 2) only examined the relationships between global EI score and emotion regulation processes, neglecting to examine the differences between the different branches of EI. In this thesis, Chapter 2 will present a meta-analysis which advances the previous one by 1) comparing three streams of EI (ability EI, self-rated EI, mixed EI) in associations with emotion regulation processes; 2)

examining the moderating effects of EI stream in relationship with emotion regulation processes; and 3) examining the moderating effects of EI branch (emotion perception, facilitation, understanding, and management) in relationship with emotion regulation processes.

EI and extrinsic emotion regulation: empirical research (Chapter 3)

In addition to influencing intrapersonal emotion regulation (one's own emotions and related outcomes), EI is also proposed to exert influence on others' emotions in interpersonal contexts (Mayer et al., 2004). The four-branch model of EI also encompasses social contexts, where the four abilities outlined in the model is related to perceiving *others'* emotions, using *others'* emotions to facilitate thoughts, understanding *others'* emotions, and effectively managing *other's* emotions (Ashkanasy & Daus, 2005). Therefore, EI should also relate to processes people use to regulate other people's emotions (extrinsic emotion regulation). As the four branches represent different emotional abilities, it is also hypothesized that EI branches will play different role in relationships with extrinsic emotion regulation. In this thesis, Chapter 3 will present a cross-sectional study which explores the associations between ability EI and extrinsic emotion regulation, comparing the relative contribution of the four branches of ability EI to the use of eight different extrinsic emotion regulation processes. The major reason why only ability EI is included is that there is already emerging research examining the relationship of rating scales of EI with extrinsic emotion regulation (e.g., Austin et al., 2013; MacCann et al., 2022; Wang et al., 2021).

1.4 Overview and Aims of the Present thesis

The thesis aims to examine the relationships between EI and intrinsic/extrinsic emotion regulation by conducting two studies: 1) a meta-analysis (Chapter 2) which explores the relationships between EI and intrinsic emotion regulation by examining the moderating effects of EI stream and EI branch; and 2) a cross-sectional study (Chapter 3) which explores

the relationships between the four major branches of ability EI and extrinsic emotion regulation. The combination of the two studies will advance our understanding of EI and intrinsic emotion regulation, and will also contribute to our knowledge of ability EI and extrinsic emotion regulation, of which there is very limited research.

CHAPTER 2: The Relationship between Emotional Intelligence and Emotion Regulation: A Meta-Analysis

2.1 Abstract

Emotional intelligence (EI) is a set of *capacities* people have whereas emotion regulation processes are *behaviours* people engage in. These may be related, as people's capacities (EI) influence what they do (emotion regulation). The current meta-analysis (n = 67 studies, k = 618 effects) examines the associations of the three major streams and four major ability branches of EI with 20 different emotion regulation processes. EI showed significant positive associations with three putatively adaptive regulation processes (direct situation modification, positive reappraisal, and seeking help) and significant negative associations with three putatively maladaptive regulation processes (avoidance, self-blame, and expressive suppression). EI stream moderated the associations of EI with acceptance, positive reappraisal, distraction, and seeking help (effects were weaker for ability EI than other streams; and effects were weaker for mixed EI than self-rated EI). EI branch moderated the associations of ability EI with direct situation modification and seeking help, where associations were stronger for emotion management than emotion perception. Findings suggest that: (1) emotionally intelligent people tend to regulate their emotions by either solving the problems (direct situation modification and seeking help) or changing their mindset towards the emotional situations (positive reappraisal); and (2) both test format (ability versus rating scale) and the theoretical content (ability vs mixed models) significantly affect the correlations between EI and emotion regulation.

Keywords: emotional intelligence, emotion regulation, meta-analysis

2.2 Introduction

There are two traditions that study emotional experiences: emotional intelligence (EI) and emotion regulation. EI reflects individual differences in the abilities to perceive, use, understand and manage emotions (Mayer et al., 2016). Emotion regulation refers to the processes used to influence which emotions people have, when they have them, how long they last, and how they are experienced and expressed (Gross, 1998b). These two traditions are complementary, because they focus on two elements of emotional experience: capacities people have (the EI tradition, focusing on individual differences) and what people do (the emotion regulation tradition, focusing on processes that occur over time) (Mestre et al., 2016). Having greater skills with emotions (i.e., higher EI) would logically affect the extent to which people use different emotion regulation processes. For example, emotionally intelligent people may tend to employ adaptive emotion regulation processes more often than maladaptive emotion regulation processes.

The major goal of the current study is to evaluate the associations between EI and emotion regulation meta-analytically, by estimating the extent to which EI relates to different emotion regulation processes. We consider two moderators of this effect: a) the stream of EI assessment (ability tasks, self-ratings of ability, or self-ratings of broader emotion-related qualities) and b) the branch of EI (emotion perception, emotion facilitation of thought, emotion understanding, or emotion management). In the paragraphs below, we outline the different theoretical and measurement models of EI and describe how we classify emotion regulation processes from multiple models into a single conceptual framework. We argue that EI is linked with higher use of putatively adaptive regulation processes and lower use of putatively maladaptive processes, with the emotion-management branch the most relevant component underpinning these relationships.

Emotional Intelligence (EI)

The concept of EI was first introduced by Salovey and Mayer (1990) as "appraisal and expression of emotion in oneself and in others, the effective regulation of emotion in self and others, and the use of feelings to motivate, plan, and achieve in one's life" (p. 185). Since then, many different definitions and models of EI have been developed. As suggested by Mayer et al. (2000), measurement models for EI can be categorized into two groups: ***ability tests***, in which the test-takers demonstrate their knowledge of emotions and the capability of applying this knowledge; and ***rating scales***, which require test-takers to rate their agreement with the statements about their tendency to perform emotion-related behaviours. The well-known four-branch definition of EI was proposed by Mayer and Salovey (1997), where *EI is the ability to perceive, use, understand, and manage emotional information*. This four-branch model is most-commonly measured with an ability test called MSCEIT (Mayer-Salovey-Caruso Emotional Intelligence Test; Mayer & Salovey, 2002). In addition to the ability test, there are also rating scales of EI, which use a variety of different definitions. Some rating scales use the four-branch ability definition or EI, but others define EI as a mix of different concepts including character traits and typical ways of behaving in emotional situations.

In order to distinguish among the various research constructs of EI, Ashkanasy and Daus (2005) identified three streams encompassing theoretical models and the associated measures: 1) Stream 1 ability tests based on Mayer and Salovey's (1997) four-branch model (ability EI); 2) Stream 2 self- and peer-report scales also based on the Mayer-Salovey definition (self-rated EI); and 3) Stream 3 rating scales based on other expanded models, which were called 'mixed' models of EI (mixed EI). Though there has been criticism towards the categorization of mixed EI that these EI assessments do not share conceptually coherent definition, the current meta-analysis followed using this categorization because it has been widely applied in EI literature. These three types of EI assessments were considered as

different constructs. Previous meta-analysis presented small association between self-rated EI and ability EI (r = .12) and small to moderate association between mixed EI and ability EI (r = .23) (Joseph & Newman, 2010). The small to moderate associations suggest that the constructs of self-rated EI and mixed EI are weakly related to ability EI. Though self-rated EI was found to show strong correlation with mixed EI in the same meta-analysis (r = .52), they are different in terms of the content that they tend to measure, that self-rated EI measure the self-perceptions of emotional abilities whereas mixed EI measure personality traits or competencies related to emotions (O'Boyle et al., 2011). These three streams are briefly summarized in Table 2.1.

Table 2.1

Three Streams of Emotional Intelligence Measurements.

Stream	Measurement Model	Theoretical Model	Example Assessments	Example Test Item
1. Ability EI	Ability test	Ability to perceive, use, understand and manage emotions	MSCEIT (Mayer et al., 2002); MEIS (Mayer et al., 1997); STEM/STEU (MacCann & Roberts, 2008); JACBART (Matsumoto et al., 2000); DANVA-2 (Nowicki & Carton, 1993)	"A pleasant experience ceases unexpectedly and there is not much that can be done about it. The person involved is most likely to feel? (a) Ashamed; (b) Distressed; (c) Angry; (d) Sad; (e) Frustrated" (MacCann & Roberts, 2008)
2. Self-rated EI	Rating scale	Ability to perceive, use, understand and manage emotions [a]	WLEIS (Wong & Law, 2002); SREIS (Brackett et al., 2006); PEC (Brasseur et al., 2013) AES (Schutte et al., 1998)	"I have a good understanding of my own emotions" (Wong & Law, 2002)
3. Mixed EI	Rating scale	Constellation of personality traits and other competencies	ECI (Boyatzis et al., 2000); EQ-i (Bar-On, 2006); TEIQue (Petrides & Furnham, 2003)	"I believe I'm full of personal strengths" (Petrides & Furnham, 2003)

Note. MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test; MEIS = Multifactor Emotional Intelligence Scale; STEM = Situational Test of Emotion Management; STEU = Situational Test of Emotional Understanding; JACBART = Japanese and Caucasian Brief Affect Recognition Test; DANVA-2 = Diagnostic Analysis of Nonverbal Accuracy-Second Edition; WLEIS = Wong and Law Emotional Intelligence Scale; SREIS = Self-Rated Emotional Intelligence Scale; PEC = Profile of Emotional Competence; AES = Assessing Emotions Scale; ECI = Emotional Competence Inventory; EQ-i = Emotional Quotient Inventory; TEIQue = Trait Emotional Intelligence Questionnaire

[a] Some assessments use an earlier ability-based definition of EI that does not include the ability to understand emotions.

Stream 1 (ability EI) includes ability tests of EI developed based on the four-branch model. The four branches are: 1) emotion perception, 2) emotion facilitation of thought, 3) emotion understanding, and 4) emotion management in oneself and others. Emotion perception refers to the ability to perceive people's emotions through verbal or visual cues. Emotion facilitation of thought involves the capacity to generate and use emotions to assist thinking and solving problems. Emotion understanding relates to the ability to analyse and forecast the development and outcomes of emotions. Emotion management reflects the capacity to effectively manage one's own and others' emotions to realize positive outcomes (Mayer et al., 2004, 2016). Branches become sequentially more complex from the most basic (emotion perception) to the most complex (emotion management) (Mayer et al., 2016; Mayer & Salovey, 1997). The ability tests of EI use maximum-performance assessments to measure one or more of the four branches of the four-branch model. For example, test-takers are asked to identify emotions in the pictures or to choose the appropriate processes to effectively manage emotions.

Stream 2 (self-rated EI) encompasses rating scales based on either the four-branch model (i.e., perception, facilitation, understanding and management) or sometimes the earlier working model of EI (Salovey & Mayer, 1990), which does not include the branch of understanding emotions (i.e., appraisal, expression, use, and management of emotions). For example, the Assessing Emotions Scale (AES) developed by Schutte et al. (1998) used this earlier ability model of EI. Self-rated EI tests measure one's subjective impressions of performances in emotion-related situations (Dang et al., 2020). The test-takers rate how much the statements agree with their behaviours in non-specific situations generally in daily life (e.g., "I am aware of my emotions as I experience them"; response options are given on a 5-point scale from 1 (*strongly disagree*) to 4 (*strongly agree*)).

Stream 3 (mixed EI) includes self-rated scales based on models with broader conceptual definitions of EI, including both emotion-related competencies and a broad range of personality, affect, motivation and traditional social skills. These models were described as 'mixed' because they assess a broad mix of concepts related to EI (Mayer, Salovey, et al., 2000). A typical example is the trait model of EI, a constellation of dispositions and self-perceived abilities related to emotions (Petrides & Furnham, 2001). The Trait Emotional Intelligence Questionnaire (TEIQue; Petrides & Furnham, 2003) measures people's self-perceptions about their capability in four domains: emotionality, sociability, self-control, and well-being (Petrides, 2009). Other major conceptualizations for mixed EI include the model of emotional competence (Goleman, 1998) and the emotional and social competence model (Bar-On, 2006). The instruments used to measure mixed EI are usually rating scales (e.g., "On the whole, I have a gloomy perspective on most things."; response options are given on a 7-point scale from 1 (*completely disagree*) to 7 (*completely agree*)). Compared to the self-rated measures for ability EI in Stream 2, the Stream 3 measures overlap more with traditional measures for personality in terms of the measurement method and content (O'Boyle et al., 2011), which was supported by a recent meta-analysis about personality and trait EI (r = .85) (van der Linden et al., 2017).

Emotion Regulation

The Temporal Process Model of Emotion Regulation

The dominant model of emotion regulation is Gross's (1998b) temporal process model, which defined emotion regulation as "processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998, p. 275). The temporal process model of emotion regulation specifies a situation-attention-appraisal-response sequence in the unfolding process of emotion, distinguishing five families of emotion regulatory processes. The five families include

situation selection (processes involving approaching or avoiding certain people, places, or objects), *situation modification* (processes that actively modify the situation directly), *attention deployment* (processes that change attentional focus strategically), *cognitive change* (processes that change the way we think in order to change the way we feel), and *response modulation* (processes that influence the response tendencies once the emotions have been elicited). The five families could be further categorized as *antecedent-focused emotion regulation* (i.e., situation selection, situation modification, attentional deployment, and cognitive change), which occur early in the emotion generative process; and *response-focused emotion regulation* (i.e., response modulation), which occur after the emotions are elicited. Previous research found that positive reappraisal (a typical antecedent-focused emotion regulation process) is more effective than expressive suppression (a typical response-focused emotion regulation process) in adaptive emotion regulation (e.g., Gross, 1998a) and health regulation (e.g., Appleton et al., 2014). However, as most research only compared these two processes, Naragon-Gainey et al. (2017) argued that there is no concrete conclusion about the relative effectiveness of antecedent- and response-focused emotion regulation.

Our Classification Scheme for Emotion Regulation Processes

In order to aggregate across multiple studies that delineate emotion regulation processes in slightly different ways, it was necessary to develop a taxonomy that integrated the differing definitions and measurements of emotion regulation processes. Previous research used different terminologies for similar concepts of emotion regulation or coping processes. For example, 'positive reinterpretation and growth' from COPE (Carver et al., 1989) and 'reappraisal' from the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) both refer to positive reinterpretation of the situation, and thus the two processes can be collectively classified as 'positive reappraisal'. In order to empirically summarize prior

findings meta-analytically, we first needed to develop a coherent classification scheme that amalgamates processes from different coping and emotion regulation measures into a single framework. This classification involved: 1) creating a list of the major emotion regulation processes from different measures; and 2) drawing conceptual correspondences between the definitions or item content of such processes.

To create a comprehensive list of processes included in multiple models, we considered the processes listed in: a) previous meta-analyses on emotion regulation which provided a clear framework for categorizing emotion regulation processes (Aldao et al., 2010; Naragon-Gainey et al., 2017; Peña-Sarrionandia et al., 2015; Schäfer et al., 2016); and b) emotion regulation questionnaires that use a framework listing emotion regulation or coping processes, including the Ways of Coping Questionnaire (WCQ; Folkman et al., 2000); COPE and brief COPE (Carver, 1997; Carver et al., 1989); Emotion Labour Scale (ELS; Brotheridge & Lee, 2003); Emotion Regulation Questionnaire (ERQ; Gross & John, 2003); Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski & Kraaij, 2007); and the Regulation of Emotion Systems Survey (RESS; De France & Hollenstein, 2017). Measures that were developed in the coping tradition (e.g., WCQ, COPE, and brief COPE) were also included as previous meta-analyses did. Coping is not synonymous with emotion regulation, as it focuses on responding to a specific stressor (e.g., Gross, 1998b). That is, coping can be considered a subset of emotion regulation that focuses only on down-regulating negative emotions in response aversive environmental characteristics (i.e., stressors). Therefore, the distinction between the two traditions of coping and emotion regulation is one of specificity not of kind, such that coping assessments are relevant to be included as part of emotion regulation.

Examination of conceptual correspondence among these processes led us to the following 20 common emotion regulation processes. They are ‘common’ because their

theoretical importance has been recognized by previous meta-analytic research and they have also been widely measured in previous empirical research. Table 2.2 gives the definitions of these 20 emotion regulation processes and the subscales which map onto each of them.

Classification of Emotion Regulation as Adaptive versus Maladaptive

Because EI involves skill with emotions (both detecting emotions and the strategic knowledge of how to deal with emotions), people with high EI should logically be better at regulating emotions. That is, they should be less likely to use generally ineffective processes and more likely to use generally effective ones. Though the effectiveness of emotion regulation processes is context-dependent, processes can be putatively classified as overall generally *adaptive* or *maladaptive* depending on their associations with psychological or physical health, well-being, burnout, and job satisfaction (e.g., Aldao & Nolen-Hoeksema, 2012; Garnefski & Kraaij, 2018; Hülsheger & Schewe, 2011; Joseph & Newman, 2010; Kammeyer-Mueller et al., 2013; Kato, 2015; Orvell et al., 2022; Peña-Sarrionandia et al., 2015; Rodríguez-Menchón et al., 2021; Webb et al., 2012; Yin et al., 2019). Considering this evidence base, the putatively *adaptive* emotion regulation processes are: deep acting, distancing, direct situation modification, acceptance, positive reappraisal, and seeking help. The putatively *maladaptive* emotion regulation processes are: avoidance, catastrophizing, denial, expressive suppression, other-blame, rumination, self-blame, surface acting, use of substances, and venting. Distraction, humour, religious coping, and restraint coping were identified as neither adaptive nor maladaptive because the evidence on their associations with positive and negative emotional outcomes was inconsistent.

Table 2.2

Our Classification Scheme for Common Emotion Regulation Processes.

Regulation Process	Definition	Subscales
Adaptive Processes		
Direct situation modification (*situation modification*)	Taking active steps to try to change the situation or fix the problem.	WCQ 'Confrontive coping', 'Planful problem-solving'; COPE 'Active coping', 'Planning', 'Suppression of competing activities'; CERQ 'Refocus on planning'
Acceptance (*cognitive change*)	Accepting the situation and the emotions elicited by the situation.	COPE 'Acceptance'; CERQ 'Acceptance'
Distancing (*cognitive change*)	The feeling of being independent of the event and the associated emotions.	WCQ 'Distancing'
Positive reappraisal (*cognitive change*)	Reappraising the situation or one's response to it in a more positive way.	WCQ 'Positive reappraisal'; COPE 'Positive reinterpretation and growth'; brief COPE 'Positive reframing'; ERQ 'Reappraisal'; CERQ 'Positive reappraisal', 'Putting into perspective'
Deep acting (*response modulation*)	Making an effort to feel the emotions that one must show and bring the true emotions into alignment with what is required.	ELS 'Deep acting'
Seeking help	Seeking others' advice and help on the problem, or seeking others' emotional comfort.	WCQ 'Seeking social support'; COPE 'Seeking social support for instrumental reasons', 'Seeking social support for emotional reasons'; brief COPE 'Using emotional support', 'Using instrumental support'
Maladaptive Processes		
Avoidance (*situation selection*)	Avoiding the external stimuli (e.g., situations, people, places) and the internal stimuli (e.g., thoughts, emotions, sensations, memories, and urges).	COPE 'Behavioural disengagement'
Denial (*situation selection*)	Refusing to believe that the stressor exists or trying to act as though the stressor is not real.	WCQ 'Escape-Avoidance'; COPE 'Denial'

Catastrophizing (*attention deployment*)	Explicitly emphasizing the terror of what one has experienced.	CERQ 'Catastrophizing'
Rumination (*attention deployment*)	Engaging in repetitive, negative thoughts about the negative emotion-eliciting situations in the past or in the future.	CERQ 'Focus on thought/rumination'
Other-blame (*cognitive change*)	Blaming the environment or another person for what one has experienced	CERQ 'Blaming others'
Self-blame (*cognitive change*)	Blaming oneself for what one has experienced.	WCQ 'Accepting responsibility'; brief COPE 'Self-blame'; CERQ 'Self-blame'
Expressive suppression (*response modulation*)	Suppressing emotional expression in face, voice, or body language.	ERQ 'Suppression'
Surface acting (*response modulation*)	Pushing down one's authentic expression of self in favour of an emotional mask.	ELS 'Surface acting'
Use of substances (*response modulation*)	Exaggerated consumption of alcohol, drugs, or medicines in order to anesthetize thoughts, feelings, and/or physical arousal.	COPE 'Alcohol-drug disengagement'; brief COPE 'Substance use'
Venting (*response modulation*)	The tendency to focus on whatever is distressing or annoying and to vent the associated feelings.	COPE 'Focus on and venting of emotions'; brief COPE 'Venting'
Uncategorized Processes		
Restraint coping (*situation selection*)	Holding oneself back and not acting prematurely, to wait until an appropriate opportunity.	WCQ 'Self-controlling'; COPE 'Restraint coping'
Distraction (*attention deployment*)	Shifting one's attention to something else (either less negative aspects of the situation or something external to the situation).	COPE 'Mental disengagement'; brief COPE 'Self-distraction'; CERQ 'Positive refocusing'
Religious coping	The tendency to turn to religion under stress.	COPE 'Turning to religion'; brief COPE 'Religion'
Humour	Redirecting attention to something funny, or re-interpreting the thing in a funny way.	brief COPE 'Humour'

Note. WCQ = Ways of Coping Questionnaire (Folkman et al., 2000); COPE (Carver et al., 1989); brief COPE (Carver, 1997); ELS = Emotion Labour Scale (Brotheridge & Lee, 2003); ERQ = Emotion Regulation Questionnaire (Gross & John, 2003b); CERQ = Cognitive Emotion Regulation Questionnaire (Garnefski & Kraaij, 2007); RESS = Regulation of Emotion Systems Survey (De France & Hollenstein, 2017). The categorizations of emotion regulation processes into five emotion regulation families are based on how well the definition of each regulation process maps into the specific stages.

Linking Emotional Intelligence (EI) and Emotion Regulation (ER)

The tradition of emotion regulation has focused on the process of experiencing and regulating emotions (differences over time), whereas the tradition of EI has focused on people's emotional capacities (differences between people). Bucich and MacCann (2019) regarded emotion regulation as a set of *things that people do*, and EI as a set of *skills or characteristics that people possess*. Linking these two traditions together would contribute to our understanding of the mechanism underlying the influence of EI on individuals' emotions (Bucich & MacCann, 2019; Mestre et al., 2016).

A previous meta-analysis by Peña-Sarrionandia et al. (2015) examined the empirical evidence for the link between EI and emotion regulation. They found that emotionally intelligent people tend to use more of some emotion regulation processes (such as reappraisal and direct situation modification) and less of others (such as avoidance and rumination). The current meta-analysis represents an advance on Peña-Sarrionandia et al. (2015) in several ways. First, we consider the distinctions between the theoretical and measurement models by comparing all three streams of EI, whereas Peña-Sarrionandia et al. (2015) only distinguished ability EI (measured by ability tests) and trait EI (measured by rating scales). Second, we explicitly statistically test the possible moderating effects of EI stream; in contrast, the previous meta-analysis did not examine whether ability EI and trait EI showed significantly different relationships to emotion regulation processes. Third, we examine whether the branch of ability EI (i.e., perceiving, using, understanding, and managing emotions in the four-branch model) moderates the associations between EI and emotion regulation. Emotion regulation was proposed as a set of processes through which EI would produce positive outcomes (Peña-Sarrionandia et al., 2015; Zeidner et al., 2012), yet not all types of emotion regulation are effective pathways through which EI could exert positive effects. Considering the solid positive relationships established between EI and well-being and other

positive life outcomes (e.g., Martins et al., 2010; Schutte et al., 2007), it is reasonable to hypothesize that the directions of the relationships between EI and emotion regulation would vary in terms of the putative effectiveness of the emotion regulation processes. We hypothesize that *emotional intelligence will be positively related with (putatively) adaptive emotion regulation processes, but negatively related with (putatively) maladaptive emotion regulation processes* (**Hypothesis 1**).

Moderating effects of EI stream

Although the previous meta-analysis by Peña-Sarrionandia et al. (2015) presented the aggregated effect sizes of ability EI (measured by ability tests) and trait EI (measured by rating scales) on emotion regulation processes, they did not statistically measure the differences between ability EI and trait EI in terms of the directions and magnitude of their relations to emotion regulation processes. However, several previous meta-analyses have found that rating scales of EI (both Stream 2 and Stream 3) show stronger associations with most life outcomes, including subjective well-being (Sánchez-Álvarez et al., 2016; Xu et al., 2020), job performance (O'Boyle et al., 2011), and mental health (Martins et al., 2010; Schutte et al., 2007). Perhaps the only exception is academic performance, which relates more strongly to ability tests of EI (Stream 1) than to rating scales (MacCann, Jiang, et al., 2020). Method effects could possibly explain these findings, as variables measured by the same test formats could lead to higher correlations (i.e., self-rated scale outcomes correlate more strongly with self-rated scales of EI than with ability tests of EI). The test formats reflect typical mental processes involved in evaluating one's performance (Brackett et al., 2006): Self-rated measures of EI show the individuals' self-rated propensity to behave in non-specific emotional situations (Furnham & Petrides, 2003; Petrides & Furnham, 2003), and ability tests measure EI by external criterion and test individuals' maximal performance in certain conditions (Fiori et al., 2014). Therefore, the assessment types of EI would

influence its relationship with emotion regulation. As people's tendency to use specific emotion regulation or coping processes was mostly measured by self-rated scales, we hypothesize that *EI measured by rating scales (self-rated EI and mixed EI) will show a stronger relationship with emotion regulation processes than EI measured by ability tests (ability EI)* (**Hypothesis 2a**).

In addition to method effects, there are also construct effects which may influence the associations between EI and life outcomes (MacCann, Jiang, et al., 2020). As self-rated EI and mixed EI measures are based on different theoretical models of EI, they may show different magnitudes of relationship to emotion regulation processes. Self-rated EI scales include content relating to the successful management of emotions, as one of three or four critical content areas. Mixed EI scales include a broader range of content that encompasses personality, affect, and traditional social skills (Ashkanasy & Daus, 2005). Therefore, compared to the mixed models, the ability model of EI shares more similarity with the constructs of emotion regulation (due to the greater focus on the ability to *manage* emotions, which is conceptually almost identical with the ability to *regulate* emotions). It is then hypothesized that *EI measured by self-rated EI measures will show a stronger relationship with emotion regulation processes than EI measured by mixed EI measures* (Hypothesis 2b).

Moderating effects of EI branch

Mayer et al. (2016) argued that the four abilities in the ability model of EI proceeded from the most basic area (perceiving emotions) to more cognitively complex areas (using, understanding, and managing emotions). When dealing with emotions elicited by external events, usually under stress, there is a hierarchy for using emotional abilities: the abilities to perceive and identify emotions are the very basic skills, which would contribute to understanding and analysis of the emotional information, and these two sets of skills are the basis for the ability to manage emotions (Salovey et al., 1999). Joseph and Newman (2010)

also specified a similar cascading pattern in the ability model of EI, and their findings supported the sequential relationships among the three branches (perceiving, understanding, and managing emotions) that the associations between EI and job performance are dependent on the EI branches under consideration (e.g., the branch 'managing emotions' showed the highest association with job performance). Therefore, it is reasonable to hypothesize that when relating EI to emotion regulation, EI branches will moderate the associations. The branch 'managing emotions' has the closest conceptual representation of emotion regulation, and it is the branch that is most aligned with emotion regulation under the hierarchy of the four-branch model. Therefore, it is hypothesized that *managing emotions will show stronger associations with emotion regulation processes than the other three branches (perceiving, using, and understanding emotions)* (**Hypothesis 3**).

2.3 Method

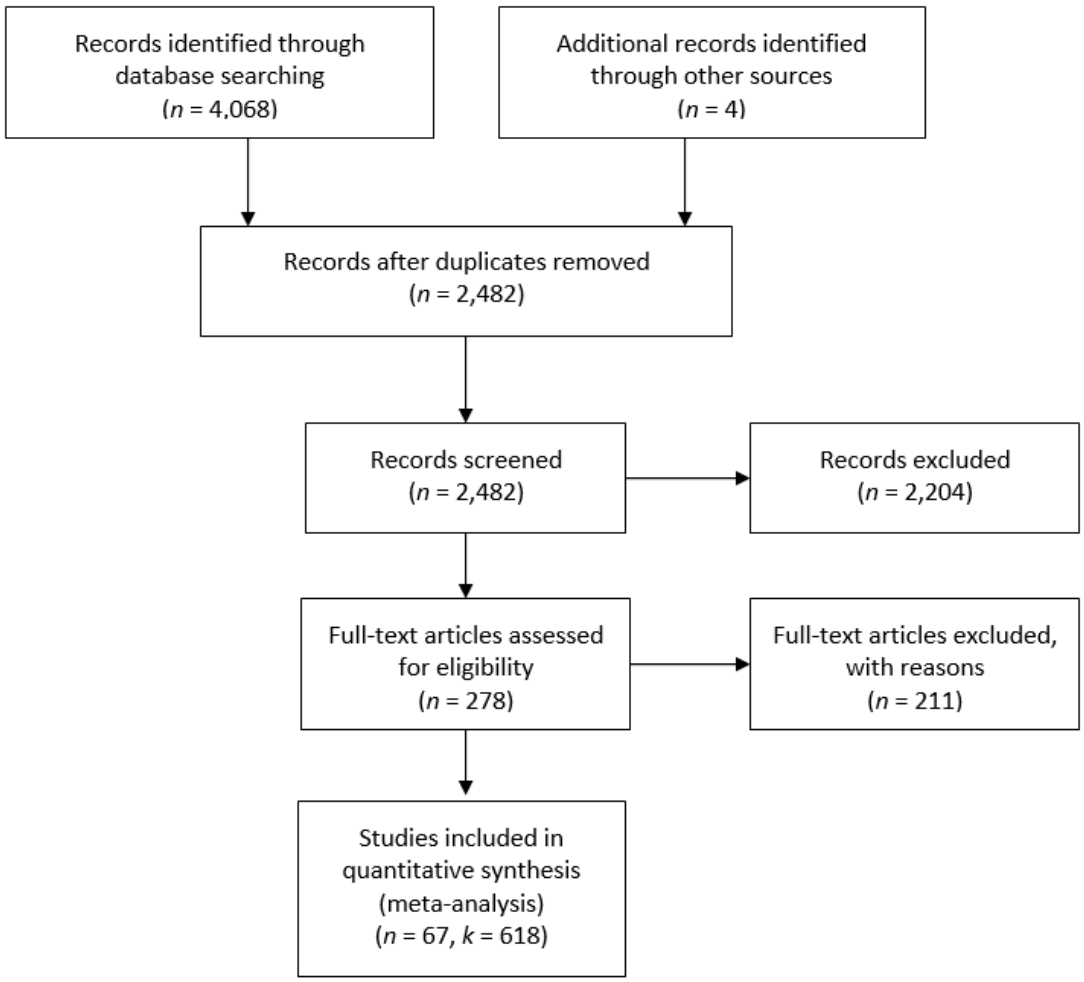
Search Strategy

The following four databases were used to search for relevant studies on emotional intelligence and emotion regulation: PsycINFO, ERIC, Scopus, and Medline. For emotional intelligence, the search string was "(emotional intelligence) OR (emotion perception) OR (emotion understanding) OR (emotion facilitation) OR (emotion recognition) OR (emotion management) OR (Mayer-Salovey-Caruso Emotional Intelligence Test) OR (Geneva Emotion Recognition Test) OR (Multimodal Emotion Recognition Test) OR (Profile of Emotion Competence) OR (Multifactor emotional intelligence scale) OR (trait emotional intelligence questionnaire) OR (Schutte Self Report emotional intelligence test) OR (Wong and Law emotional intelligence scale) OR (BarOn EQ-i) OR (Diagnostic Analysis of Nonverbal Accuracy) OR (Reading the mind in the eyes)". For emotion regulation, the search string was "(emotion regulation) OR (difficulties in emotion regulation scale) OR (cognitive emotion regulation questionnaire) OR (situation selection) OR (situation modification) OR

(attention* deployment) OR (cognitive change) OR (response modulation) OR coping OR (direct situation modification) OR reapprais* OR (social shar*) OR (emotion* shar*) OR suppress*". Combining the two sets of keywords yielded an initial set of 4067 publications in October 2020. Another set of unpublished data was provided by the authorship team, resulting in an additional n = 5 citations containing k = 40 effect sizes (one of the citations was then published in May 2022). After removing the duplicates, the title, abstract, and full-text were reviewed based on the exclusion and inclusion criteria. The overall literature search resulted in n = 67 citations containing 81 samples and k = 618 effect sizes. The search strategy is presented in the PRISMA flowchart in Figure 1.

Figure 1

PRISMA flowchart for the identification, screening, and inclusion of publications in the meta-analysis.



Note. *n* = number of publications, *k* = number of effect sizes

Inclusion and Exclusion Criteria

The publications were included if they met the following inclusion criteria: (a) written in English or Chinese; (b) the measures of EI and emotion regulation were published in either a test manual or journal article; (c) referred to original data not reported in any other article; (d) reported a correlation between EI and at least one emotion regulation process (or reported data from which an unbiased estimate of effect size could be calculated); (e) reported a

sample size; and (f) included emotion regulation processes which could be clearly identified as a single emotion regulation process (rather than an aggregation of many processes). On the other hand, articles were excluded based on the following exclusion criteria: (a) based on the same data as another article included in the meta-analysis; (b) the EI constructs were not based on established ability, trait, or mixed EI theory; and (c) based on clinical and forensic populations. A summary of citations included is presented in the Appendix.

Coding

The first author coded each of the 618 effect sizes. A second coder (the 3rd author) coded 39 citations (58.2% of all citations) to test the reliability of coding. Cohen's Kappa was used to denote the inter-rater reliability for each coding variable. According to Viera and Garrett (2005), Kappa between 0.81 and 0.99 means "almost perfect agreement", 0.61-0.80 means "substantial agreement", 0.41-0.60 means "moderate agreement", 0.21-0.40 means "fair agreement", lower than 0.01 means "less than chance agreement" (p. 362). Disagreements were resolved by the first author going back to the original paper.

Effect size. Uncorrected Pearson's correlation (*r*) was used as the metric of effect size. The Kappa between the two coders was .88.

Sample size. Sample size ranged from 50 to 1,281 with a median of 204 and a mean of 264.5 (25% of observations were based on 125 or fewer participants and 25% of observations were based on 312 or more participants). The Kappa between the two coders was .97.

Gender. Gender was coded as a continuous variable using percentage (%) of female participants in each citation. This value ranged from 0% to 100%, with a median of 64% and a mean of 61.6%. The Kappa between the two coders was .99.

Ethnicity. Ethnicity was coded as a continuous variable using percentage (%) of White participants in each citation. This variable was only coded for samples from the United

States, where ethnicity was commonly reported using the same categories. Most observations (k = 181 of 220) reported this information. Percentage White ranged from 59% to 100% with a median of 80% and a mean of 80.68%. The Kappa between the two coders was .92.

Age. Mean sample age of participants was coded as a continuous variable. If the study did not report mean age but gave an age range, the median age in the range was used. Five of the 81 samples reported neither mean age nor age range; these samples were excluded when calculating the ages of participants included in this meta-analysis. The mean sample age ranged from 13.03 to 75.73 with a median of 22.33. The Kappa between the two coders was .98.

Reliabilities of measures. The reliability of the measures for EI and emotion regulation was coded. If a study did not provide information about the reliability of the measures for EI or emotion regulation, the estimate was obtained from the test manual or original psychometric validation study. The Kappa between the two coders was .95 for reliability of EI measures, and .96 for reliability of emotion regulation measures.

Standard deviation of EI and ER. Standard deviations were recorded for measures for EI and emotion regulation. The Kappa between the two coders was .89 for standard deviation of EI, and .94 for standard deviation of emotion regulation.

EI stream. EI stream was coded into three categories: ability EI (63.5%, k = 392), self-rated EI (17.7%, k = 109), and mixed EI (18.8%, k = 116). The most commonly used test was the MSCEIT (56.7%, k = 349). The Kappa between the two coders was .95.

EI branch. Effects were coded as representing one of the four ability branches (perceiving, using, understanding, and managing emotions) or global EI. Other branches/facets of EI were not coded. The Kappa between the two coders was .85.

ER process. Emotion regulation processes were coded into 20 categories, according to the classification scheme presented in this meta-analysis: acceptance (6.6%, k = 41),

avoidance (5.8%, *k* = 36), catastrophizing (1.6%, *k* = 10), deep acting (0.8%, *k* = 5), denial (2.3%, *k* = 14), direct situation modification (18.2%, *k* = 112), distancing (1.1%, *k* = 7), distraction (9.7%, *k* = 60), expressive suppression (7.0%, *k* = 43), humour (1.8%, *k* = 11), other-blame (1.6%, *k* = 10), positive reappraisal (15.6%, *k* = 96), religious coping (2.8%, *k* = 17), restraint coping (2.4%, *k* = 15), rumination (3.1%, *k* = 19), seeking help (11.0%, *k* = 68), self-blame (2.6%, *k* = 16), surface acting (0.8%, *k* = 5), use of substances (1.3%, *k* = 8), and venting (3.9%, *k* = 24). The most commonly used emotion regulation processes were direct situation modification (18.2%, *k* = 112), positive reappraisal (15.6%, *k* = 96), and seeking help (11.0%, *k* = 68). The Kappa between the two coders was .90.

Publication type. Publication type was coded as a categorical moderator with 3 levels: peer-reviewed journal articles (67.4%, *k* = 417), dissertations (26.1%, *k* = 161), and unpublished data (6.5%, *k* = 40). The Kappa between the two coders was .97.

Statistical Analyses

The random effects model was used as it assumes that the studies are drawn from different populations. The reported effect sizes were first corrected for measurement errors in EI and emotion regulation processes. The formulae and processes were outlined by Hunter et al. (2006), that the corrected effect size (ρ) equals to effect size (r) divided by the square root of the multiplier of reliability (r_{xx} and r_{yy}) of the two independent variables (EI and emotion regulation measures) (i.e., $\rho = r/\sqrt{r_{xx}r_{yy}}$). The outliers for each meta-analysis were detected and removed using the outlier labelling rule in Hoaglin and Iglewicz (1987), using the multiplier of $g = 2.2$. Robust Variance Estimation (RVE) was used to control for dependencies between effect sizes (Hedges et al., 2010) when some effect sizes came from the same samples. RVE were shown to be accurate estimates of effect sizes when the nature of correlations between effect sizes was unknown (Moeyaert et al., 2017). The 'robumeta'

package in R was used to conduct the multilevel random effect meta-analysis (Fisher et al., 2016).

Meta-regressions using RVE were conducted to test the moderating effects of EI stream and EI branch in Hypotheses 2 and 3 separately. For categorical moderators (EI stream and EI branch), we also conducted subgroup analyses to calculate the relative magnitude of the differences. Contrast coding was used in the meta-regressions for categorical moderators. To test the moderating effects of EI stream, Helmert coding was first applied to compare: a) Stream 1 versus Streams 2 and 3; and b) Stream 2 versus Stream 3. Specifically, contrasts for Streams 1, 2, and 3 were coded as (1 -0.5 -0.5) and (0 1 -1) respectively. To test the moderating effects of EI branch, dummy coding was used to compare: a) emotion management vs. perception; b) emotion management vs. facilitation; and c) emotion management vs. understanding. Contrasts for emotion perception, facilitation, understanding, and management were coded as (1 0 0 0), (0 1 0 0), and (0 0 1 0).

In each of the three EI streams, publication bias was tested separately for the 20 emotion regulation processes. We visually inspected asymmetry in 60 funnel plots, and Egger's test was conducted to test asymmetry in the funnel plots. Seventeen groups of correlations between EI and emotion regulation processes had a small number of effect sizes ($k < 3$), in which case Egger's test cannot be conducted. In the remaining 43 groups of correlations between EI and emotion regulation processes, significant asymmetry was tested in 9 groups: ability EI and avoidance ($z = 2.8045$, $p < .01$), direct situation modification ($z = -2.6583$, $p < .01$), distraction ($z = -3.3175$, $p < .001$), religious coping ($z = -2.7572$, $p < .01$), rumination ($z = -.2397$, $p = .03$); self-rated EI and acceptance ($z = 2.2385$, $p = .03$); mixed EI and direct situation modification ($z = -2.6216$, $p < .01$), positive reappraisal ($z = -2.0566$, $p = .04$), and venting ($z = -2.2962$, $p = .02$). Because Egger's test has not been implemented with robust variance estimation, publication bias was calculated using a meta-regression with the

standard error of the uncorrected effect sizes as a predictor. Therefore, there is evidence of publication bias for the above selected studies, where there is selective publication for significant results.

2.4 Results

Hypothesis 1: Overall Correlation Between EI and Emotion Regulation Processes

There was sufficient data to test hypotheses for 12 of the 20 emotion regulation processes. Estimates of the association of EI (overall, and for branches 1, 2, and 3) with these emotion regulation processes are presented in Table 2.3. Eight regulation processes were excluded because: 1) $k < 2$, such that meta-analyses could not be conducted; 2) $df < 4$ for subgroup analyses, such that findings cannot be reliably interpreted, where Satterthwaite approximation is not valid (Fisher & Tipton, 2015); or 3) an error of singular matrix was returned when using RVE in R. Therefore, the results for catastrophizing, denial, distancing, humour, other-blame, restraint coping, surface acting, and use of substances were not included.

Overall EI and Adaptive Processes. As shown in Table 2.3, overall EI showed significant positive relationships with three of the five putatively adaptive emotion regulation processes, with effect sizes that were moderate-to-large (direct situation modification), moderate (positive reappraisal) or small-to-moderate (seeking help). Associations were not significant for acceptance or deep acting.

Overall EI and Maladaptive Processes. Overall EI showed significant negative associations with three of the five putatively maladaptive emotion regulation processes, with effect sizes that were moderate (avoidance), or small-to-moderate (expressive suppression and self-blame). Associations were not significant for rumination or venting.

Overall EI and Uncategorized Processes. Overall EI showed no significant relationship to processes that were not identified as adaptive or maladaptive (distraction and religious coping).

These results support Hypothesis 1, as all significant associations were in the expected direction (positive with putatively adaptive processes and negative with putatively maladaptive processes).

Table 2.3

Meta-Analytical Results of the Overall Link between EI and Emotion Regulation Processes and Subgroup Analyses – Overall EI, and by Streams 1, 2, and 3

						95% CI				
Subgroup	*n*	*k*	*N*	*r*	*ρ*	Lower	Upper	I^2	*p*	*df* [a]
Adaptive Processes										
Direct situation modification										
Overall	42	52	8,422	0.32	0.37	0.31	0.43	88.47%	<.001	39.81
Stream 1	11	16	1,150	0.09	0.09	0.00	0.19	44.93%	0.056	8.89
Stream 2	15	19	3,426	0.41	0.47	0.40	0.55	86.60%	<.001	13.88
Stream 3	16	17	3,846	0.34	0.42	0.35	0.49	85.39%	<.001	14.80
Acceptance										
Overall	16	17	2,784	-0.07	-0.11	-0.30	0.08	97.16%	0.249	14.98
Stream 1	5	5	685	0.03	0.03	-0.28	0.34	82.90%	0.793	3.93
Stream 2	3	4	617	0.24	0.32	-0.07	0.71	82.00%	0.072	1.99
Stream 3	8	8	1,482	-0.25	-0.36	-0.58	-0.14	95.12%	0.006	7.00
Positive reappraisal										
Overall	29	40	6,747	0.21	0.25	0.17	0.32	91.92%	<.001	27.76
Stream 1	9	11	1,947	0.09	0.12	-0.04	0.27	85.22%	0.122	7.76
Stream 2	7	11	1,642	0.36	0.41	0.29	0.52	90.05%	<.001	5.93
Stream 3	15	18	3,887	0.22	0.26	0.16	0.37	90.93%	<.001	13.95
Deep acting										
Overall	5	5	1,211	0.17	0.17	-0.35	0.69	98.03%	0.411	4.00
Stream 1		$k < 2$ [b]								
Stream 2	2	2	622	0.46	0.51	0.01	1.02	45.50%	0.049	1.00
Stream 3	3	3	589	-0.03	-0.06	-1.02	0.89	96.79%	0.806	2.00
Seeking help										
Overall	22	29	6,315	0.18	0.23	0.16	0.29	84.83%	<.001	20.45
Stream 1	6	8	2,260	0.02	0.02	-0.12	0.15	82.42%	0.769	4.57
Stream 2	10	11	3,073	0.25	0.31	0.23	0.39	72.87%	<.001	8.76
Stream 3	9	10	3,347	0.16	0.20	0.12	0.28	66.70%	<.001	7.36
Maladaptive Processes										
Avoidance										
Overall	14	14	2,257	-0.17	-0.22	-0.34	-0.09	95.41%	0.003	12.98
Stream 1	4	4	352	-0.16	-0.21	-0.45	0.04	53.53%	0.072	2.88
Stream 2	3	3	567	-0.01	-0.02	-0.10	0.06	0.00%	0.477	1.94
Stream 3	7	7	1,338	-0.25	-0.32	-0.53	-0.10	96.60%	0.011	6.00
Rumination										
Overall	7	7	1,354	-0.09	-0.11	-0.35	0.13	93.70%	0.311	5.99
Stream 1	2	2	470	-0.09	-0.10	-3.58	3.38	96.45%	0.777	1.00
Stream 2	2	2	164	-0.08	-0.08	-3.31	3.14	91.61%	0.794	1.00
Stream 3	3	3	720	-0.10	-0.13	-0.77	0.50	94.63%	0.460	2.00
Self-blame										
Overall	6	6	1,351	-0.25	-0.33	-0.53	-0.12	91.55%	0.009	4.99
Stream 1	2	2	503	-0.07	-0.09	-1.27	1.08	70.78%	0.496	1.00
Stream 2		$k < 2$ [b]								
Stream 3	4	4	848	-0.32	-0.43	-0.57	-0.30	55.71%	0.002	2.97

Expressive suppression									
Overall	14	19	5,199	-0.14	-0.17	-0.29	-0.05	96.52%	0.011	12.95
Stream 1	5	5	1,376	-0.13	-0.17	-0.39	0.06	85.27%	0.111	3.86
Stream 2	6	9	2,614	-0.14	-0.16	-0.39	0.08	97.93%	0.154	4.99
Stream 3	5	5	1,938	-0.18	-0.21	-0.49	0.07	95.85%	0.102	4.00
Venting									
Overall	10	11	2,494	-0.06	-0.09	-0.26	0.07	94.63%	0.239	8.98
Stream 1	3	3	253	-0.14	-0.20	-0.67	0.26	66.33%	0.200	1.98
Stream 2	2	2	1,479	0.09	0.13	-1.58	1.84	92.07%	0.512	1.00
Stream 3	5	6	762	-0.07	-0.12	-0.43	0.18	93.48%	0.324	4.00
Other processes									
Distraction									
Overall	33	36	7,178	0.06	0.07	-0.02	0.15	93.55%	0.121	31.77
Stream 1	10	10	1,123	-0.10	-0.13	-0.27	0.01	74.20%	0.066	8.78
Stream 2	9	11	2,787	0.22	0.27	0.10	0.43	91.59%	0.005	7.90
Stream 3	14	15	3,268	0.06	0.07	-0.03	0.17	89.32%	0.169	12.91
Religious coping									
Overall	6	9	1,146	0.11	0.14	-0.07	0.35	87.00%	0.149	4.96
Stream 1	2	2	203	-0.02	-0.02	-1.70	1.66	70.95%	0.900	1.00
Stream 2	3	5	815	0.22	0.28	-0.12	0.67	91.65%	0.093	2.00
Stream 3	2	2	551	0.01	0.02	-0.11	0.15	0.00%	0.336	1.00

Note. EI = emotional intelligence.

[a] When the degree of freedom is lower than four ($df < 4$), the results are not reliable.

[b] When the number of effect sizes is smaller than two ($k < 2$), it is not possible to conduct meta-analytic analyses of the correlations between EI and the emotion regulation process.

Hypothesis 2: Moderating Effects of EI Stream

Table 2.3 presents the subgroup analyses for EI stream, showing the meta-analytic association of regulation processes with Stream 1, 2 and 3 EI. Table 2.4 presents the results of meta-regressions testing hypotheses that: a) EI rating scales (Streams 2 and 3) show a stronger relationship to emotion regulation than ability tests (Stream 1) and b) Stream 2 (self-rated EI) shows a stronger relationship to emotion regulation than Stream 3 (mixed EI). We presented meta-regression results of seven emotion regulation processes (direct situation modification, acceptance, positive reappraisal, seeking help, avoidance, expressive suppression, and distraction) following the exclusion criteria listed under Hypothesis 1.

The moderating effects of EI stream on the association between EI and emotion regulation were examined by subgroup analyses and meta-regressions with RVE (see Tables 2.3 and 2.4).

EI Rating Scales versus Ability Tests. For four of the seven emotion regulation processes examined, ability EI showed significantly weaker effects compared to rating scales (Table 2.4). Specifically, significantly weaker associations were found for ability EI versus self-rated and mixed EI for: a) direct situation modification ($\rho = .09$ vs. $\rho = .47$ and .42, $p < .001$), b) positive reappraisal ($\rho = .12$ vs. .41 and .26; $p = .012$), c) seeking help ($\rho = .02$ vs. .31 and .20; $p = .002$), and d) distraction ($\rho = -.13$ vs. .27 and .07; $p = .001$). There were no significant differences by stream for acceptance, avoidance, or expressive suppression. These results largely support Hypothesis 2a, as all significant results were in the expected direction (i.e., ability EI showed weaker relationships to emotion regulation compared to rating scales of EI).

Sefl-rated EI versus Mixed EI. There were significant differences between self-rated EI and mixed EI for four of the seven emotion regulation processes examined (Table 2.4), of which three were in the hypothesized direction (self-rated EI showed a stronger relationship to acceptance, positive reappraisal, and distraction) and one was in the opposite direction to hypotheses (mixed EI showed a stronger relationship to avoidance). Specifically, significantly stronger associations were found for self-rated EI versus mixed EI for: a) acceptance ($\rho = .32$ vs. -.36; $p = .008$; note that as acceptance is putatively adaptive, EI was expected to show a positive association), b) positive reappraisal ($\rho = .41$ vs. .26; $p = .040$), c) avoidance ($\rho = -.02$ vs. -.32; $p = .030$; note that as avoidance is putatively maladaptive, mixed EI showed a stronger association than self-rated EI), and d) distraction ($\rho = .27$ vs. .07; $p = .030$). There were no significant differences for direct situation modification, seeking help, or expressive suppression. Therefore, Hypothesis 2b only received partial support.

Table 2.4

Meta-Regressions Comparing EI Stream as a Moderator of the EI/Emotion Regulation Association (k = 618)

Moderator [a]	*b*	*SE*	95% CI Lower	95% CI Upper	*p*	*df* [b]
Adaptive Processes						
Direct situation modification						
Ability vs. Others	-0.24	0.03	-0.31	-0.17	0.000	13.76
Self-rated vs. Mixed	0.03	0.02	-0.02	0.08	0.263	28.60
Acceptance						
Ability vs. Others	0.03	0.09	-0.17	0.24	0.711	7.05
Self-rated vs. Mixed	0.34	0.06	0.15	0.53	0.008	3.62
Positive reappraisal						
Ability vs. Others	-0.15	0.05	-0.26	-0.04	0.012	13.54
Self-rated vs. Mixed	0.07	0.03	0.00	0.14	0.040	10.62
Seeking help						
Ability vs. Others	-0.17	0.03	-0.25	-0.09	0.002	6.73
Self-rated vs. Mixed	0.05	0.02	0.00	0.10	0.068	14.85
Maladaptive Processes						
Avoidance						
Ability vs. Others	-0.02	0.06	-0.18	0.14	0.781	5.38
Self-rated vs. Mixed	0.15	0.04	0.02	0.28	0.030	3.83
Expressive suppression						
Ability vs. Others	0.02	0.08	-0.15	0.20	0.759	7.13
Self-rated vs. Mixed	0.02	0.08	-0.17	0.21	0.813	7.60
Other Processes						
Distraction						
Ability vs. Others	-0.20	0.05	-0.31	-0.09	0.001	15.52
Self-rated vs. Mixed	0.10	0.04	0.01	0.19	0.030	17.07

Note. EI = emotional intelligence.

[a] Contrasts were (1 -0.5 -0.5) and (0 1 -1) for Ability, Self-rated, and Mixed EI, respectively.

[b] When the degree of freedom is lower than four ($df < 4$), the results are not reliable.

Hypothesis 3: Moderating Effects of EI Branch

Table 2.5 presents the subgroup analyses for EI branch, showing the meta-analytic associations between EI branches and emotion regulation processes. Table 2.6 presents the results of meta-regressions comparing the effects of emotion management to the other three branches (emotion perception, emotion facilitation, and emotion understanding) separately. The meta-analytic associations and meta-regression results of six emotion regulation processes (direct situation modification, acceptance, positive reappraisal, seeking help, avoidance, and distraction) were reported by following the exclusion criteria listed under Hypothesis 1. As expected, emotion management showed a stronger relationship with direct situation modification than did emotion perception (ρ = .22 vs. .08, p = .048) and emotion management showed a stronger relationship with seeking help than did emotion perception (ρ = .13 vs. -.07, p = .027). Therefore, Hypothesis 3 received partial support that emotion management showed stronger associations with direct situation modification and seeking help compared to emotion perception, but there was no significant evidence to support stronger effects of emotion management on other emotion regulation processes compared to the other three branches.

Table 2.5

Subgroup Analyses of the Link between EI and Emotion Regulation Processes – by Branches of the Ability EI Model from Stream 1 ability EI (k = 395)

						95% CI				
Subgroup	*n*	*k*	*N*	*r*	ρ	Lower	Upper	I^2	*p*	*df* [a]
Maladaptive Processes										
Direct situation modification										
Perception	10	15	1,548	0.07	0.08	0.01	0.16	41.50%	0.037	7.35
Facilitation	8	13	1,132	0.11	0.13	-0.08	0.35	92.18%	0.193	6.96
Understanding	9	14	1,297	0.07	0.09	-0.06	0.24	84.02%	0.211	7.86
Management	12	17	1,727	0.18	0.22	0.08	0.37	91.98%	0.006	10.94
Acceptance										
Perception	8	8	1,324	0.03	0.05	-0.11	0.21	77.20%	0.472	6.72
Facilitation	5	5	685	0.03	0.04	-0.22	0.29	74.02%	0.708	3.85
Understanding	5	5	685	0.01	0.02	-0.23	0.27	72.77%	0.849	3.86
Management	6	6	849	0.05	0.07	-0.18	0.31	82.24%	0.508	4.90
Positive reappraisal										
Perception	10	13	2,005	0.02	0.03	-0.09	0.16	81.41%	0.566	8.66
Facilitation	8	10	1,641	0.01	0.00	-0.13	0.13	74.56%	0.989	6.51
Understanding	10	12	2,112	0.01	0.02	-0.13	0.17	90.26%	0.750	8.88
Management	12	15	2,360	0.08	0.10	-0.02	0.23	87.00%	0.104	10.82
Seeking help										
Perception	6	8	2,260	-0.04	-0.07	-0.25	0.11	79.34%	0.373	4.51
Facilitation	7	9	2,483	0.05	0.05	-0.12	0.22	84.66%	0.472	5.63
Understanding	7	9	2,483	0.07	0.11	-0.15	0.37	95.39%	0.349	5.96
Management	10	12	3,675	0.09	0.13	0.02	0.25	92.07%	0.029	8.80
Maladaptive Processes										
Avoidance										
Perception	4	4	412	-0.13	-0.16	-0.44	0.12	67.08%	0.167	2.91
Facilitation	6	6	734	-0.20	-0.27	-0.37	-0.16	21.57%	0.002	4.25
Understanding	5	5	635	-0.08	-0.08	-0.44	0.28	88.64%	0.570	3.98
Management	6	6	734	-0.21	-0.26	-0.45	-0.08	77.40%	0.015	4.87
Other Processes										
Distraction										
Perception	6	6	781	-0.06	-0.11	-0.34	0.12	85.69%	0.279	4.94
Facilitation	4	4	631	0.03	0.02	-0.24	0.29	64.56%	0.781	2.78
Understanding	6	6	888	-0.04	-0.09	-0.30	0.13	79.10%	0.348	4.90
Management	9	9	1,318	0.04	0.04	-0.04	0.13	36.91%	0.262	7.01

Note. EI = emotional intelligence.

[a] When the degree of freedom is lower than four ($df < 4$), the results are not reliable.

Table 2.6

Meta-Regressions Comparing EI Branch as a Moderator of the EI/Emotion Regulation Association (k = 395)

Moderator [b]	*b*	*SE*	95% CI Lower	95% CI Upper	*p*	*df* [a]
Adaptive Processes						
Direct situation modification						
Management vs. Perception	-0.15	0.07	-0.29	0.00	0.048	10.77
Management vs. Facilitation	-0.06	0.09	-0.27	0.14	0.495	9.06
Management vs. Understanding	-0.15	0.07	-0.30	0.01	0.066	9.39
Acceptance						
Management vs. Perception	0.01	0.07	-0.18	0.19	0.946	5.20
Management vs. Facilitation	-0.06	0.06	-0.22	0.09	0.334	4.78
Management vs. Understanding	-0.09	0.08	-0.30	0.12	0.330	4.78
Positive reappraisal						
Management vs. Perception	0.00	0.09	-0.19	0.19	0.974	10.19
Management vs. Facilitation	-0.08	0.05	-0.20	0.03	0.143	9.24
Management vs. Understanding	-0.09	0.05	-0.20	0.01	0.080	9.86
Seeking help						
Management vs. Perception	-0.27	0.10	-0.50	-0.04	0.027	6.62
Management vs. Facilitation	-0.14	0.10	-0.36	0.08	0.186	7.72
Management vs. Understanding	-0.10	0.11	-0.34	0.15	0.395	7.72
Maladaptive Processes						
Avoidance						
Management vs. Perception	0.14	0.11	-0.16	0.43	0.268	4.11
Management vs. Facilitation	0.01	0.05	-0.13	0.15	0.864	4.32
Management vs. Understanding	0.18	0.08	-0.04	0.39	0.090	4.54
Other Processes						
Distraction						
Management vs. Perception	-0.12	0.06	-0.26	0.02	0.084	6.13
Management vs. Facilitation	-0.01	0.07	-0.21	0.19	0.878	3.61
Management vs. Understanding	-0.11	0.06	-0.25	0.04	0.123	5.79

[a] When the degree of freedom is lower than four ($df < 4$), the results are not reliable.

[b] Contrasts were (1 0 0 0), (0 1 0 0), and (0 0 1 0) for perception, facilitation, understanding and management of emotions, respectively.

2.5 Discussion

Although the results were generally mixed, there was some evidence to support all three of our main hypotheses. First, all significant correlations between overall EI and emotion regulation processes supported the idea that EI is positively associated with putatively adaptive regulation processes and negatively associated with putatively maladaptive regulation processes. Second, these results clearly differed across EI streams, with regulation processes showing stronger associations to EI rating scales than to ability tests (though this difference was not significant in all cases). Third, the emotion management branch of EI seemed to be the most important one in associations with emotion regulation. Emotion management was significantly related to three regulation processes (less avoidance, but more direct situation modification and seeking help). The other branches were significantly related to only one process (perception and facilitation) or to none of the processes (understanding). Results are summarized and discussed in more detail in the paragraphs below.

Findings for Hypothesis 1 (EI associations with adaptive and maladaptive regulation processes). In summary, EI showed: a) positive relationships with three putatively adaptive processes (direct situation modification, positive reappraisal, seeking help); b) negative relationships with three putatively maladaptive processes (avoidance, expressive suppression, and self-blame); but c) no significant associations with the remaining six processes examined (where we hypothesized a relationship for four of these six processes). Results of subgroup-analyses differed across EI streams—there was not a single emotion regulation process which showed consistent significant relationships with all streams of EI. Where significant results were found, they were in the hypothesized directions. Therefore, there is partial support for Hypothesis 1.

Findings for Hypothesis 2 (EI stream as a moderator). Moderating effects of EI streams in the relationship between EI and emotion regulation were demonstrated. Compared to ability tests, rating scales of EI showed: (a) stronger associations with direct situation modification, positive reappraisal, seeking help, and distraction; but (b) no significant differences in associations with acceptance, avoidance, or expressive suppression. Within rating scales, compared to mixed EI, self-rated EI showed: (a) stronger associations with acceptance, positive reappraisal, distraction; (b) weaker associations with avoidance; and (c) no significant differences in associations with direct situation modification, seeking help, or expressive suppression. The significant results were in the hypothesized directions except the meta-regression results for avoidance, where avoidance showed a stronger correlation with mixed EI than with self-rated EI. Therefore, Hypothesis 2 was partially supported.

Findings for Hypothesis 3 (EI branch as a moderator). In summary: (a) compared to emotion perception, emotion management showed stronger associations with direct situation modification and seeking help; and (b) no significant differences were found between emotion management and other branches in their associations with other emotion regulation processes. Therefore, Hypothesis 3 was only partially supported. There was no evidence to support the differences between emotion management and emotion perception in terms of their effects on other emotion regulation processes, nor was there evidence to support the differences between emotion management and other EI branches (emotion facilitation and emotion understanding).

Rationale for EI/Regulation Relationships: The Putative Adaptiveness of Emotion Regulation Processes

In the introduction, we suggested that the directions of the associations between EI and emotion regulation would depend on the putative adaptiveness of emotion regulation processes, which is related to psychological or life outcomes. Findings from the previous

meta-analysis by Peña-Sarrionandia et al. (2015) suggest that EI is associated with one's repertoire of emotion regulation processes. For example, emotionally intelligent people tend to use more putatively adaptive emotion regulation processes (e.g., reappraisal and direct situation modification) but less putatively maladaptive emotion regulation processes (e.g., avoidance and rumination). The significant findings from the current meta-analysis were in line with findings by Peña-Sarrionandia et al. (2015) that EI linked to specific patterns of emotion regulation—emotionally intelligent people showed more adaptive emotion regulation behaviour (regulating their emotions by direct situation modification, positive reappraisal, and seeking help) but less maladaptive emotion regulation behaviour (regulating their emotions by avoidance, expressive suppression, and self-blame). As argued in the introduction, the strong positive associations between EI and other psychological or life outcomes (e.g., Martins et al., 2010; Schutte et al., 2007) provided an empirical basis for the findings that EI is positively linked to three regulation processes, which were expected to contribute to positive emotional outcomes, and negatively linked to three maladaptive regulation processes, which were expected to be associated with negative emotional outcomes.

EI and putatively adaptive emotion regulation processes. The moderate-to-large correlation between overall EI and direct situation modification conforms with the previous finding that this process (referred to as 'problem solving' in previous research) demonstrated a high level of adaptive engagement with emotion regulation (Naragon-Gainey et al., 2017). Aldao and Nolen-Hoeksema (2010) argued that direct situation modification (referred to as 'problem solving' in their research) depends more on the *context* of regulation than other processes, because it aims to change the situation in order to change the emotions, instead of changing the emotions directly. That is, direct situation modification requires the ability to perceive, appraise, use, and understand the specific emotion-related elements (the context) of

each situation. The strong association between EI and direct situation modification could therefore indicate the high sensitivity of emotionally intelligent people to the context of regulation—the emotionally-relevant elements of the environment.

The moderate positive association between EI and reappraisal could be attributed to the purposeful efforts made by emotionally intelligent people to achieve positive affect (i.e., a possible difference in emotion regulation goals, where high-EI people are more likely to set goals to up-regulate positive affect and down-regulate negative affect). Positive reappraisal, by which people invest cognitive efforts in order to generate positive re-interpretations of the emotional situation, has been linked with greater experience and expression of positive emotions, but less experience and expression of negative emotions (Gross & John, 2003b). Emotionally intelligent people were argued to have the capability of cultivating positive emotions in response to external negative stimuli (Tugade & Fredrickson, 2002) and of maintaining positive emotions as much as possible in the presence of negative state induction (Schutte et al., 2002). Taken together, our results support the positive links between EI and positive reappraisal, in line with previous findings.

The small-to-moderate positive relationship between EI and seeking help could possibly be explained by the social component involved in both concepts. Seeking help is composed of seeking instrumental help from other people to solve the problem, as well as seeking emotional comfort from others to relieve negative emotions. Across different EI models, emotionally intelligent people are expected to be good at social interaction (Mayer & Salovey, 2002; Petrides, 2009), whereby they are able to seek help from others in order to effectively regulate their own emotions.

There was no evidence to support significant relationships between EI and acceptance, with a nonsignificant association between overall EI and acceptance, but a negative association between mixed EI and acceptance ($\rho = -.36$). Although accepting the

situation and the emotions elicited by the situation were putatively adaptive, previous research suggests that the acceptance process is one of the most variably implemented processes across contexts (Aldao & Nolen-Hoeksema, 2012). The adaptiveness of acceptance is therefore highly contextually dependent, and it may be identified as adaptive only when the situation cannot be modified or reappraised (Peña-Sarrionandia et al., 2015). Therefore, further research on EI and use of acceptance in specific situations are needed to examine their relationship.

Overall, the significant associations suggest a tendency for emotionally intelligent people to engage in the early trajectory of emotion regulation processes as described by Gross (1998a), as direct situation modification is a situation modification process and positive reappraisal is a cognitive change process. Seeking help has elements of both situation modification (seeking instrumental help) and response modulation (seeking emotional help), and therefore cannot be categorized into a single stage of Gross's (1998b) temporal process model of emotion regulation. The strongest correlation between EI and direct situation modification supports the argument that early interventions, before emotion response tendencies have been fully generated, can effectively alter a subsequent emotion trajectory (Gross & John, 2003b). Emotionally intelligent people tend to fix the problems that trigger their emotions, which indicates the possibility that solving the problem is a more effective way to regulate emotions than other regulation processes.

EI and putatively maladaptive emotion regulation processes. There was a small-to-moderate negative association between overall EI and avoidance. Avoidance involves disengagement from emotion regulation, by avoiding possible stimuli from the external or internal environment. This finding also corroborates the stronger association between EI and direct situation modification, which required high-level active engagement with emotion regulation. Therefore, emotionally intelligent people are less likely to avoid their emotions or

the situations that elicit the emotions, but more likely to actively engage in regulating their emotions.

A moderate negative association was found between overall EI and self-blame. Among the three EI streams, the current meta-analysis found significant negative associations between self-blame and mixed EI only. The significant negative mixed EI/self-blame link could be inferred from the fact that happiness and optimism are components of mixed EI (Bar-On, 2006; Petrides, 2009), and optimism is negatively associated with self-blame (Lee & Mason, 2013). Therefore, emotionally intelligent people, with higher optimism and happiness, are less likely to blame themselves for their emotional experiences.

There is small to moderate negative association between overall EI and expressive suppression. This finding confirms the previous claims that expressive suppression is not helpful in reducing negative emotions (e.g., Gross & John, 2003; Peña-Sarrionandia et al., 2015), which are positively associated with psychopathology (Aldao et al., 2010). However, significant associations were found between overall EI and expressive suppression but not between each EI stream and expressive suppression.

Overall, the significant findings suggest that emotionally intelligent people are less likely to avoid the situation, suppress their expression of negative emotions, or blame themselves. EI was negatively related to emotion regulation processes which show disengagement with emotions, including disengagement with the internal and external stimuli (avoidance and self-blame) and expression of emotions (expressive suppression).

Putative classification of adaptive/maladaptive emotion regulation. However, the classification (*adaptive*/*maladaptive*) of emotion regulation processes is only putative in the sense that the effectiveness of an emotion regulation process is dependent on whether the process helps realize the aim of emotion regulation in a specific context (Aldao, 2013; Aldao & Nolen-Hoeksema, 2012; Naragon-Gainey et al., 2017). Although up-regulation of positive

emotions and down-regulation of negative emotions are the most reported kinds of everyday emotion regulation (Gross, 1998a; Larsen, 2000), sometimes people may want to down-regulate their positive emotions (e.g., suppress their happiness about getting 100% in an exam that their friend failed) or up-regulate their negative emotions (e.g., up-regulate their anger when someone is being personally offensive). Research has also shown that psychopathology relates more strongly to the use of putatively maladaptive processes than the use of adaptive processes, indicating that the effectiveness of putatively adaptive processes may be more context-dependent (Aldao & Nolen-Hoeksema, 2010, 2011). Therefore, emotion regulation flexibility was argued as an important ability to implement emotion regulation processes that are "synchronized with contextual demands" (Aldao et al., 2015), which was found to be predicted by some components of ability EI (Double et al., 2022). Further research may consider the contextual elements in the association between EI and the implementation of emotion regulation processes.

EI Stream – How Is EI Measured?

Significant moderating effects of EI stream were found. As hypothesized, ability EI (Stream 1) showed weaker associations with direct situation modification, positive reappraisal, and distraction compared to rating scales of EI (Stream 2 and 3). This significant findings supports previous arguments that variables measured by the same test formats show higher correlations (MacCann, Jiang, et al., 2020), which reflect similar mental processes involved in evaluating the individuals' performances (Brackett et al., 2006). The self-rated measures of emotion regulation describe the individuals' subjective evaluation of their use of emotion regulation processes in non-specific situations in daily life, which is more similar to the rating scales of EI (i.e., self-rated propensity to behave in non-specific emotional situations; Furnham & Petrides, 2003; Petrides & Furnham, 2003) than the ability tests of EI (i.e., maximal knowledge about perceiving, using, understanding, and managing emotions).

Self-rated EI (Stream 2) showed stronger associations with acceptance, positive reappraisal, avoidance, and distraction compared to mixed EI (Stream 3). The differences between self-rated EI and mixed EI in relationships with emotion regulation processes could be attributed to the contents of the measurements. As argued above, self-rated measures of emotion regulation reflect individuals' subjective evaluations of their tendency to use emotion regulation processes. Self-rated EI has more construct similarity to the measures of emotion regulation than mixed EI does, because self-rated EI reflects individuals' subjective evaluations about their emotional abilities, including the ability to manage emotions. In contrast, mixed EI encompasses a broad range of personality, affect, and social skills which are related to emotions (Ashkanasy & Daus, 2005). Self-rated EI represents *emotional self-efficacy* and may therefore be a strong predictor of emotional behaviour according to social-cognitive theory (Bandura, 2001). That is, people's beliefs about whether they can successfully perceive, appraise and manage emotions will determine the types of responses they make. There is substantial evidence from both health psychology and work psychology that self-efficacy (one's beliefs about one's capabilities) influences both intentions and behaviours (e.g., Sadri & Robertson, 1993; Schwarzer & Fuchs, 1996). Social-cognitive models of behaviour change such as the Theory of Planned Behaviour (Ajzen, 1991) would predict that self-rated EI (emotional self-efficacy) would influence both regulation intentions (i.e., the regulation goals that people form) and regulation outcomes (i.e., the regulation processes that people select). Our results, where there are generally stronger associations with emotion regulation for self-rated than mixed EI, suggest that the *self-efficacy beliefs* about emotional capabilities may be a driver of the emotion regulation behaviours people engage in.

EI Branch—Is Emotion Management the Key Ingredient?

Previous meta-analyses suggest that emotion management is the key ingredient in ability EI, as the branch that shows the strongest relationship with outcomes such as positive affect and workplace performance (Joseph & Newman, 2010; MacCann, Erbas, et al., 2020). Our meta-analysis generally supports the idea of emotion management as the most important branch. Emotion management showed stronger correlations with direct situation modification and seeking help compared to emotion perception. However, no significant differences were found between emotion management and other EI branches (emotion facilitation and understanding) in their associations with other emotion regulation processes. Hypothesis 3 was only partially supported. The significant differences between emotion perception and emotion management support the hierarchy of using emotional abilities in the four-branch model of EI (Joseph & Newman, 2010; Salovey et al., 1999), where the abilities of perceiving emotions are the very basic skills, forming the foundation for the abilities of managing emotions. However, emotion management did not show stronger associations with all the emotion regulation processes compared to the other three branches. The finding that ability EI was not significantly associated with any one of the emotion regulation processes included in the current meta-analysis could support the limited significant associations found between EI branches and emotion regulation processes (direct situation modification, seeking help, and avoidance). The nonsignificant differences between emotion management and emotion facilitation/understanding also suggest that the abilities to use emotions to facilitate thoughts, the abilities to analyse and understand emotional information, and the abilities to manage emotions, are not different in their relationships with the use of emotion regulation processes.

Limitations

This meta-analysis summarized a classification scheme for common emotion regulation processes but failed to examine the relationships between EI and *all* of these regulation processes, due to the limited diversity of emotion regulation processes explored by previous empirical research. There were insufficient studies to examine the relationship of EI with distancing, deep acting, denial, catastrophizing, rumination, other-blame, self-blame, surface acting, use of substances, venting, restraint coping, distraction, religious coping, and humour. The major contributor to the unequal distribution of number of effect sizes may be that some emotion regulation processes are identified and assessed by multiple assessments of emotion regulation (e.g., direct situation modification, positive reappraisal, and seeking help), whereas some emotion regulation processes are only specifically assessed by one or two measures (e.g., deep acting and surface acting).

There are also limitations regarding statistical analyses. Although RVE allowed us to make inferences with a very small number of studies (Fisher & Tipton, 2015), the number of effect sizes of the relationships between EI and some of the emotion regulation processes are too small to be interpretable (i.e., results with $df < 4$). Among those interpretable subgroup analyses and meta-regressions, some of them were based on a small number of samples (i.e., from two to five). The precision of these results is therefore lower and they should be interpreted more cautiously. The interpretations of the results should also be taken with careful consideration of the Type I error, as multiple effect sizes were reported within a single sample in most studies included in the current meta-analysis.

Last, the current meta-analysis only assessed the relationships between EI and self-rated measures of emotion regulation. This test format reflects subjective evaluation of the habitual use of emotion regulation processes in non-specific emotional situations, but does not allow for assessment of contextual use of regulation processes. Emotion regulation

processes are not purely adaptive or maladaptive across all situations (Bonanno & Burton, 2013). Therefore, the flexibility of using emotion regulation processes depending on the contexts may be a better indicator of effective emotion regulation. The relationships between EI and emotion regulation processes can only demonstrate how individual differences in emotional abilities are related to general patterns of emotion regulation, but cannot serve as persuasive indicators of effective emotion regulation, understood as using different emotion regulation processes flexibly to meet the regulatory goals in specific situations (Kobylińska & Kusev, 2019).

Future Directions

This meta-analysis suggests numerous areas of focus for further research on EI and emotion regulation. One obvious future direction is to expand the diversity of measures of EI and emotion regulation used in different samples. By employing EI measures from the three streams and emotion regulation measures that contain unique regulation processes (e.g., deep acting, surface acting, rumination, self-blame, etc.), future research could contribute to the range of associations between EI and emotion regulation, which could allow for a thorough examination of relationships between EI and all emotion regulation processes, as well as the moderations of EI stream and EI branch. Further, as flexibility of emotion regulation has been argued to be representative of effective emotion regulation (Aldao et al., 2015; Kobylińska & Kusev, 2019), additional research considering situational context in emotion regulation when associating with EI could help understand how EI is related to effective emotion regulation. Future research could also examine whether EI relates to the formation of emotion regulation goals, which drive the selection of emotion regulation processes according to the extended temporal process model (Gross, 2015).

2.6 Conclusions

The current meta-analysis examined the relationships between EI and emotion regulation, as well as the underlying mechanisms through EI stream and EI branch. Although results of a limited number of emotion regulation processes were presented, the current study revealed that EI consistently had positive associations with putatively adaptive regulation processes, whereas EI had negative associations with putatively maladaptive regulation processes. The findings suggest that high EI individuals tend to regulate their emotions by either solving the problems (direct situation modification and seeking help) or changing their interpretations towards the emotional situations (positive reappraisal). Furthermore, the test formats and theoretical models of the EI measures (i.e., EI stream) and the components of EI model (i.e., EI branch) significantly moderate the associations between EI and some of the emotion regulation processes. Substantial additional research considering a more diverse range of emotion regulation processes and the situational context of emotion regulation will help understand how EI is related to effective emotion regulation.

CHAPTER 3: Emotionally Intelligent People Use More High-Engagement and Less Low-Engagement Processes to Regulate Others' Emotions

The contents of this chapter are a minor revision of the following submitted manuscript:

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3.1 Abstract

Existing research has linked emotional intelligence (EI) with intrinsic emotion regulation (processes people use to regulate their own emotions). However, there has not yet been empirical examination of whether EI abilities relate to extrinsic emotion regulation (processes people use to regulate other people's emotions). This study (N = 178 undergraduates) examines whether ability EI (as measured by the Mayer-Salovey-Caruso Emotional Intelligence Test) correlates with eight extrinsic regulation processes (as measured by the Regulation of Others' Emotions Scale, including downward comparison, expressive suppression, humour, distraction, direct action, reappraisal, receptive listening, valuing). Total ability EI score is significantly positively correlated with three high-engagement processes (r = .24, .40, and .16 for reappraisal, receptive listening, and valuing) and negatively correlated with two low-engagement processes (r = -.30 and -.38 for downward comparison and expressive suppression). When all four EI branches predicted each regulation process in multiple regression, only emotion management significantly predicted downward comparison, receptive listening and valuing, and only emotion management and understanding predicted expressive suppression (no significant regression coefficients for reappraisal). We conclude that the drivers of EI/extrinsic regulation associations are engagement with the target's emotion and the emotion management branch of EI.

3.2 Introduction

Emotion regulation is typically described as the processes people use to influence the type, intensity or timing of an emotion (Gross, 1999) whereas EI is the ability to perceive, use, understand, and manage emotions (Mayer et al., 2016). That is, emotion regulation is a set of behaviours (things people think or do) whereas EI is a set of personal characteristics (capacities people possess). Research shows that EI relates to which emotion regulation processes people use (e.g., emotionally intelligent people use less rumination and more positive reappraisal; Peña-Sarrionandia et al., 2015). However, research on EI/emotion regulation associations to date has focused solely on intrinsic emotion regulation (the processes we use to regulate our own emotions). Recently there has been growing interest in extrinsic emotion regulation (the processes we use to regulate other peoples' emotions). Several researchers have begun to characterize the processes involved in extrinsic emotion regulation, the predictors of extrinsic emotion regulation, and how extrinsic and intrinsic emotion regulation processes differ (Niven et al., 2009; Nozaki & Mikolajczak, 2020). Our research adds to this growing area by examining for the first time whether EI abilities relate to extrinsic as well as intrinsic emotion regulation processes. Our major research question is whether the four ability branches of EI (emotion perception, facilitation, understanding, and management; Mayer et al., 2016) relate to eight extrinsic emotion regulation processes (MacCann, 2022).

Extrinsic Emotion Regulation

The most influential model of emotion regulation is the temporal-process model, which describes emotions (and attempts to regulate them) as a process that unfolds over time (Gross, 1999). Emotions occur in a situation-attention-appraisal-response sequence, and can be regulated at different points along this sequence. Emotion regulation processes are classified in terms of five emotion regulation stages: 1) *situation selection* (changing the

trajectory of emotion by approaching or avoiding particular situations); 2) *situation modification* (changing the situation to remove/reduce the emotional trigger); 3) *attention deployment* (changing the focus of attention towards or away from particular elements to change the emotional impact of those elements); 4) *cognitive change* (changing the cognitions about of the situation to reduce the situation's emotional impact); and 5) *response modulation* (directly changing the emotional response). The theory holds that emotion regulation is less effortful and more effective if it occurs at earlier stages of the sequence rather than at the response modulation stage. This model has mainly been applied to intrinsic emotion regulation, and only recently extended to examine extrinsic regulation (e.g., Matthews et al., 2021; Tanna & MacCann, 2022).

Extrinsic emotion regulation was defined as "an action performed with the goal of influencing another person's emotion trajectory; it can aim to decrease or increase either negative emotion or positive emotion" (Nozaki & Mikolajczak, 2020, p. 10). We refer to the person who regulates others' emotions as the *regulator*, and the person being regulated as the *target*. This study considers eight extrinsic regulation processes identified by MacCann (2022), which were based on Niven et al.'s (2009) classification of interpersonal emotion regulation processes: (1) *downward comparison* (changing the target's interpretation of the emotion-eliciting event by shifting their frame of reference, specifically by comparing their situation to someone who is worse off); (2) *expressive suppression* (encouraging the target to avoid expressing their feelings in their face, voice, or body language); (3) *distraction* (focusing the target's attention away from the situation details triggering their emotions); (4) *humour* (using humour to make the target feel better); (5) *direct action* (changing the target's situation to alter its emotional impact); (6) *reappraisal* (encouraging the target to change the way they think about their situation in order to change its emotional impact); (7) *receptive listening* (listening to the target express their emotions in socially shared language, typically

describing the emotional event that they just experienced or witnessed); and (8) *valuing* (giving the target attention to make them feel valued or special). These processes differ in their levels of engagement with the target's emotions (i.e., the attention and emotion invested on the target) from low (downward comparison and expressive suppression), to moderate (distraction, humour, direct action), and to high (reappraisal, receptive listening, valuing).

Emotional Intelligence (EI)

The major theoretical model of EI is the Mayer-Salovey four-branch model (Mayer et al., 2016) where emotional intelligence comprises four abilities: 1) *emotion perception* (accurately perceiving emotions others' facial expressions, tone-of-voice, body language, or in evocative creative works); 2) *emotion facilitation of thoughts* (using one's emotional state to facilitate task performance or goal achievement, which involves both knowing which emotions will be useful for which tasks, and being able to generate those emotions if required); 3) *emotion understanding* (understanding the causes and consequences of one's own and others' emotions, and how they are likely to progress over time); and 4) *emotion management* (knowing which actions would be most effective to manage emotions in oneself or others to achieve personal goals). The four branches proceed from the most basic area (emotion perception) to the more cognitive complex area (emotion management) (Mayer et al., 2016; Mayer & Salovey, 1997). EI can be assessed with both rating scales (often referred to as 'trait EI') and ability scales (often referred to as 'ability EI'). These are largely separate constructs (despite sharing the same name) and are empirically unrelated (e.g., Joseph & Newman, 2010). The current study uses an ability EI framework, and the research below refers to ability EI only.

Ability EI is related to intrinsic emotion regulation processes. Peña-Sarrionandia et al.'s (2015) meta-analysis found that higher EI was associated with lower use of avoidance, rumination, and denial, but higher use of problem-solving, reappraisal, and social support

seeking. Allen et al. (2014) linked low EI with a decision not to regulate (i.e., not to use any regulation processes) and lower use of situation modification processes but linked high EI with frequent selection of situation modification and cognitive change processes. Megías-Robles et al. (2019) also found that higher EI was associated with lower expressive suppression and higher reappraisal.

However, EI is also expected to affect people's behaviour in interpersonal contexts (Mayer et al., 2004) and should therefore relate to the processes people use to regulate other people's emotions. When dealing with target's negative emotions, emotionally intelligent people should be better at: identifying which emotions the target is experiencing (emotion perception), using the target's emotions as information to inform their own judgements and behaviours (emotion facilitation), understanding the causes of the target's emotions (emotion understanding), and managing the target's emotions (emotion management).

Associations of EI with Emotion Regulation

Two major axioms drive hypothesis generation in our study. First, because high EI results in greater availability of emotional information about others, it should mean that high EI people are more able and more willing to engage with the emotions of other people. That is, emotionally intelligent people can perceive, understand and use the emotional information to a greater extent. Therefore, EI should show strong positive associations with the high-engagement emotion regulation processes, but negligible or negative associations with the low-engagement emotion regulation processes. Second, because the different branches of EI focus on different abilities, the branch that is most conceptually relevant to regulating emotions (emotion management) should show the strongest associations with extrinsic emotion regulation processes. We outline the logic of these axioms in more detail below.

EI should relate to highly engaging processes. Extrinsic emotion regulation processes differ in the degree to which they require the regulator to devote thought, time,

attention and energy to the target's emotional state and its causes. For example, expressive suppression requires little investment of time or attention—the regulator simply tells the target not to express their emotions. All that is required is that the regulator notices the target is expressing an emotion and evaluates that this is undesirable. In contrast, receptive listening requires active effort on the part of the target. The regulator must pay attention to the target as they express their emotions and make appropriate sympathetic responses, which involves a much greater investment of time and attention. MacCann (2022) classifies the eight extrinsic regulation processes as representing low engagement with the target (downward comparison, expressive suppression), moderate engagement with the target (distraction, humour, direct action) or high engagement with the target (receptive listening, reappraisal, valuing). This classification is supported by correlations of the eight extrinsic regulation processes with empathy and communal orientation—high-engagement processes are positively associated with such variables whereas low-engagement processes show negative or non-significant associations (MacCann, 2022; Tanna & MacCann, 2022). For example, communal orientation (a tendency to behave in a communal manner by taking others needs into account) showed a significant negative association with downward comparison (r = -.32) but significant positive associations with reappraisal, receptive listening and valuing (r = .23 to .52).

We propose that people with higher EI have greater capacity to engage with others' emotions. They can better detect the emotions others feel (emotion perception), know which emotions will be useful for others feel (emotion facilitation), understand what has caused the person to feel that way (emotion understanding) and know which processes will be effective in regulating their emotions (emotion management). With this knowledge, engaging with others' emotions is less risky, as emotionally intelligent people are less likely to say the wrong thing and worsen the emotional state. It is also easier, as emotionally intelligent people

know what to do. There is evidence that high EI people are more likely to engage with others' emotions—they have lower attachment avoidance and compassion fatigue but higher empathy (Beauvais et al., 2017; Brackett et al., 2006; Walker et al., 2022). We therefore propose that high EI will show positive as-sociations with the three high-engagement emotion regulation processes (reappraisal, receptive listening, and valuing) and negative associations with the two low-engagement emotion regulation processes (downward comparison and expressive suppression).

The emotion management branch of EI should show the strongest association with extrinsic emotion regulation processes. The emotion management branch of EI is often referred to as emotion regulation ability (e.g., Brackett et al., 2010; Extremera & Rey, 2015; Ivcevic & Brackett, 2014), defined as "the capacity to regulate one's own and others' emotional states" (Brackett et al., 2010, p. 407) or the "ability to reason about effectiveness of different emotion regulation strategies" (Ivcevic & Brackett, 2014, p. 29). In essence, emotion management is the ability people draw on to decide which emotion regulation processes to select in a given situation. Other branches may influence whether a regulation attempt is made. For instance, you must perceive the target's emotional state in order to attempt regulation, which involves emotion perception ability. Moreover, you must understand the likely trajectory of the emotion (will it get worse or be long-lasting if nothing is done?) to decide whether a regulation attempt is warranted, which involves emotion understanding ability. However, the selection of which processes to use is more clearly related to emotion management than to any other branch of EI. For this reason, we expect extrinsic emotion regulation processes to show stronger associations with emotion management than with the other branches of EI.

Hypotheses

Hypothesis 1: EI will be significantly associated with extrinsic emotion regulation. Specifically, there will be: a) positive correlations with reappraisal, receptive listening and valuing, and b) negative correlations with downward comparison and expressive suppression. We have no specific hypotheses about direct action, humor or engagement, but rather examine these associations in an exploratory manner.

***Hypothesis 2: Emotion management will show the strongest prediction of extrinsic emotion regulation*.** When all four EI branches are regressed on each emotion regulation process, the emotion management branch will show the strongest prediction of extrinsic emotion regulation.

3.3 Method

Participants and Procedures

Participants were 179 undergraduate psychology students (35 male, 143 females, 1 nonbinary) recruited from the first author's institution. As there is only one participant self-identified as 'nonbinary', we only included participants who identified themselves as either male or female (N = 178) in order to use dichotomous gender as a control variable. Participants were aged between 17 and 47 years (M = 19.87 years, SD = 3.38 years). Of all the participants, 44% self-identified as Caucasian, 39% as Asian, 10% as Mixed, 4% as Arab, and 3% reported other racial background. They participated in the study for course credit, signed up via the online SONA recruitment system, and completed the assessments online on a device of their choosing. Data and research materials from this study are available at https://osf.io/82r46/?view_only=71c575c8ba4943f3ac715dbd01e8d507.

Measures

Demographic questions

Participants were asked five demographic questions at the beginning of the survey about their gender, age, proficiency of English, ethnicity, and education level: (1) What gender do you identify as? (2) What is your age in years? (3) How well do you speak English? (4) What ethnicity to you identify with? (5) What is your highest qualification?. The ethnicity question was free response, and all other questions required participants to select a single option.

Emotional intelligence

The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer et al., 2002) consists of 141 items for 8 subtests (two subtests for each branch of emotion perception, facilitation, understanding, and management). Perception subtests ask participants to rate the extent to which several emotions (e.g., sadness, excitement) are present in: a) facial expressions (Faces test) and b) pictures (Pictures test). Facilitation subtests ask participants to rate: a) how helpful several moods would be for different tasks (Facilitation test) and b) how similar certain physical sensations are to the feeling of emotions (Sensations test). Understanding subtests ask participants to select which response: a) represents the best description of complex emotion, based on its constituent emotions (Blends test) or b) represents the most likely time course for an emotion, given a particular scenario (Changes task). Management subtests present participants with written vignettes of emotional scenarios and ask them to rate how effective several responses would be (for the vignette protagonist) for: a) regulating their own emotions (Management test) or b) maintaining a good social relationship with others (Relations test). In this study, we used consensus scoring and considered the total score as well as four branch scores (Emotion Perception, Facilitation, Understanding, and Management). In previous studies of university students, MSCEIT scores related to higher psychological well-being (Brackett & Mayer, 2003), life satisfaction

(Bastian et al., 2005), empathy (Brackett et al., 2006), and social functioning (Lopes et al., 2005), providing evidence for the validity of the MSCEIT in university student samples.

Extrinsic emotion regulation

The Regulating Others' Emotions Scale (ROES; MacCann, 2022) consists of eight four-item subscales, where each item is rated in a 6-point agreement scale ranging from "strongly disagree" (1) to "strongly agree" (6): 1) expressive suppression (I tell them not to frown or cry); 2) downward comparison ("I tell them things could be a lot worse"); 3) distraction ("I divert their attention to something else"); 4) humour ("I do something amusing"); 5) direct action ("I try to fix things for them"); 6) reappraisal ("I help them see events in a new way"); 7) receptive listening ("I listen to them talk about their emotions"); and 8) valuing ("I make them feel special or cared about"). These items are prefaced with the statement "I do the following things to MAKE OTHER PEOPLE FEEL BETTER". In prior validation studies, the ROES item showed good fit to an eight-factor solution, with scores showed evidence of discriminant validity with respect to broad personality traits, convergent validity with regard to the association with three other emotion regulation assessments, and convergence between self- and inform-ant-reports (MacCann, 2022).

3.4 Results

Reliability and Descriptive Statistics

Reliability and descriptive statistics for key study variables are presented in Table 3.1. Reliability was moderate-to-high for all scales, ranging from .72 (MSCEIT Understanding) to .90 (for humour). There were significant medium-sized gender differences in two extrinsic emotion regulation processes, with higher scores for females on receptive listening and valuing (d = -.53 and -.50 respectively). There were no other significant gender differences. Correlations are presented in Table 3.2.

Table 3.1

Descriptive statistics, reliabilities, and standard deviations for study variables.

	Alpha	*M*	*SD*
Age	-	19.87	3.38
MSCEIT: Perception	.86	.47	0.08
MSCEIT: Facilitation	.77	.42	0.07
MSCEIT: Understanding	.72	.49	0.07
MSCEIT: Management	.77	.35	0.07
MSCEIT: Total	.92	.43	0.06
ROES: Downward Comparison	.92	2.68	1.18
ROES: Expressive Suppression	.85	2.34	1.10
ROES: Distraction	.84	4.17	0.93
ROES: Humour	.90	4.06	1.17
ROES: Direct Action	.83	4.07	0.93
ROES: Reappraisal	.80	4.80	0.66
ROES: Receptive Listening	.85	5.42	0.63
ROES: Valuing	.86	4.80	0.99

Note. MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test; ROES = Regulating Others' Emotions Scale.

Table 3.2

Bi-variate correlations between study variables (N = 178).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	-													
2. Gender (0 = Male; 1 = Female)	-.03	-												
3. MSCEIT: Perception	.09	.04	-											
4. MSCEIT: Facilitation	.08	.19**	.53**	-										
5. MSCEIT: Understanding	.10	.02	.46**	.53**	-									
6. MSCEIT: Management	.11	.16*	.38**	.52**	.61**	-								
7. MSCEIT: Total	.12	.13	.76**	.80**	.81**	.79**	-							
8. Downward Comparison	.06	-.06	-.18*	-.24**	-.22**	-.32**	-.30**	-						
9. Expressive Suppression	.06	-.03	-.20**	-.27**	-.38**	-.36**	-.38**	.63**	-					
10. Distraction	-.13	.11	-.04	.05	-.20**	-.14	-.11	.28**	.38**	-				
11. Humour	-.18*	-.09	.05	.08	-.04	-.05	.01	.23**	.22**	.60**	-			
12. Direct Action	.02	-.12	.08	.02	.07	-.08	.03	.14	.21**	.32**	.36**	-		
13. Reappraisal	-.01	.12	.14	.23**	.16*	.23**	.24**	-.01	.02	.33**	.19*	.36**	-	
14. Receptive Listening	-.10	.22**	.21**	.30**	.34**	.43**	.40**	-.32**	-.37**	.11	.18*	.13	.30**	-
15. Valuing	-.01	.22**	.07	.12	.07	.25**	.16*	-.06	-.01	.23**	.36**	.22**	.17*	.54**

* $p < .05$, ** $p < .001$.

Hypothesis 1: EI and Extrinsic Emotion Regulation (Differences among Processes)

Total EI was significantly positively correlated with reappraisal, receptive listening, and valuing but significantly negatively correlated with downward comparison and expressive suppression. The effect size was moderate-to-large for receptive listening and expressive suppression, moderate for downward comparison, and small-to-moderate for reappraisal and valuing. However, total EI was not significantly correlated with distraction, humour, or direct action. Hypothesis 1 was supported.

Hypothesis 2: EI and Extrinsic Emotion Regulation (Differences among EI Branches)

All the four EI branches were significantly positively correlated with receptive listening and significantly negatively correlated with downward comparison and expressive suppression. Facilitation, understanding and management (but not perception) were significantly positively correlated with reappraisal. Only management (but not the other branches) was significantly positively correlated with valuing. Only understanding (but not the other branches) was significantly negatively correlated with distraction.

Table 3.3 presents the results of the multiple regressions. Tolerance values ranged from .55 to .67, indicating that collinearity was sufficiently low to allow interpretation of regression coefficients. Only management (and not the other three branches) showed significant prediction of downward comparison, receptive listening, and valuing (supporting hypothesis 2). Only understanding and management (but not the other branches) predicted expressive suppression (providing some support for hypothesis 2). For distraction, there was significant positive prediction from the facilitation branch but significant negative prediction from the understanding branch (and no significant prediction from perception or management). Results largely support Hypothesis 2. For the five emotion regulation processes significantly correlated with the total EI score, emotion management was the sole significant predictor for three of them (downward comparison, receptive listening, and valuing), and one of two significant predictors for one of them (expressive suppression). None of the regression coefficients were significant for reappraisal (although the largest effect size was for management).

Table 3.3

Standardized regression coefficients from multiple regressions predicting each extrinsic regulation process from age, gender (0 = male, 1 = female) and all EI branches (N = 178).

	Downward Comparison	**Expressive Suppression**	**Distraction**	**Humour**	**Direct Action**	**Reappraisal**	**Receptive Listening**	**Valuing**
Age	.10	.11	-.11	-.19*	.01	-.04	-.15*	-.03
Gender	.00	.02	.09	-.12	-.10	.06	.15*	.17*
Perception	-.03	.00	.00	.05	.08	.01	.02	.01
Facilitation	-.09	-.06	.22*	.17	.02	.15	.04	-.01
Understanding	.00	-.23*	-.24*	-.09	.14	.00	.13	-.10
Management	-.27**	-.21*	-.11	-.07	-.19	.14	.31**	.29**
R^2	.12	.19	.10	.07	.04	.08	.24	.10

* $p < .05$, ** $p < .001$

3.5 Discussion

The present results demonstrated that EI positively correlated with the high emotional engagement extrinsic regulation processes (reappraisal, receptive listening, valuing) and negatively correlated with the two emotion disengagement processes (downward comparison and expressive suppression). Multiple regressions demonstrated that this relationship was largely accounted for by the emotion management branch (except for expressive suppression, where there was also a significant contribution of emotion understanding).

EI relates to Engagement in Target's Emotions

Our hypotheses for the EI/extrinsic regulation associations were largely based on the premise that EI would relate to engagement with the target's emotional state. As we expected, correlations were in different directions for the two processes from the 'cognitive change' family–positive associations for reappraisal but negative associations for downward comparison. These two processes are deemed 'cognitive change' processes because both change the target's feelings by changing the way they think. However, downward comparison involves a lower level of engagement in target's emotions compared to reappraisal, which indicates that less cognitive resources were invested to the target's emotional information and there is lower willingness to actively regulate the target's emotions. Moreover, the largest associations were not with the cognitive change family but the response modulation family—positive associations with receptive listening and negative associations with expressive suppression. This suggests that the major link between EI abilities and extrinsic emotion regulation processes is not the cognitive processes that produce emotions but the engagement with other people's emotions. Low expressive suppression indicates a willingness to approach or accept people's negative facial or vocal expressions of emotion whereas high receptive listening indicates a willingness to approach or accept people's verbal descriptions of their emotions.

Joseph and Newman's (2010) meta-analysis found that emotion management is the active ingredient of emotional intelligence for predicting job performance, particularly in high emotion labour jobs (those that require 'service with a smile'). Many jobs involve managing the emotional experiences of other people such as keeping customers satisfied (Kernbach & Schutte, 2005), reducing conflict among one's team members (Jiang et al., 2013), or ensuring that students remain engaged and motivated (Meyer & Turner, 2002, 2006). The advantage of high EI may be that workers use more effective processes and fewer ineffective processes for changing others' emotions—if a core performance indicator is customer happiness, then a person who more frequently uses processes that increase that happiness will be better at their job.

Limitations and Future Directions

Our research used a convenience sample (undergraduate psychology students) in a convenience design (one-off cross-sectional measurement). Future research could expand into different populations, examining the processes used to regulate others' emotions in romantic relationships, parenting, or high emotion-labour jobs (such as service work, healthcare and teaching) to ensure that findings generalize across different contexts. Our research measured extrinsic emotion regulation by self-rated scales, which reflected only subjective evaluation of the processes that people use to regulate others' emotions. Future research could adopt an objective approach to measure extrinsic emotion regulation based on behavioural indicators. As extrinsic emotion regulation requires investment of time and attention, emotionally intelligent people may strategically allocate their cognitive and emotional resources. For example, people with high EI do not always use high-engagement processes because they require high levels of cognitive and emotional investment. Therefore, future research could expand the EI/extrinsic emotion regulation associations demonstrated in our research by studying the functional ways through which emotionally intelligent people could effectively

regulate others' emotions. Future research could also examine the relationship between EI and extrinsic emotion regulation using intensive longitudinal methods such as experience sampling or daily diary studies. This is especially important as recent research shows that one-off measurements of 'trait' emotion regulation assessments represent not just regulation process choice, but also evaluations of the need to regulate and the efficacy of regulation tactics one uses (Koval et al., 2022). It could be that some elements of EI (such as emotion perception) relate to perceiving the need to regulate, some (such as emotion understanding) relate to regulation choice whereas others (such as emotion management) relate to the efficacy of regulation attempts (Double et al., 2022).

Conclusion Remarks

In conclusion, we demonstrate that EI abilities (and particularly emotion management) relate to more effective regulation of other people's emotions. The strongest links are to the expression rather than suppression of others' emotions (receptive listening rather than expressive suppression), and to cognitive change processes that focus on positives rather than negatives (reappraisal rather than downward comparison).

CHAPTER 4: General Discussion

The major aim of this thesis was to examine the relationships between EI and emotion regulation. Specifically, this thesis included intrinsic emotion regulation and extrinsic emotion regulation, testing their associations with EI separately in Chapter 2 (meta-analysis) and Chapter 3 (cross-sectional study). The meta-analysis from Chapter 2 advanced previous meta-analysis by Peña-Sarrionandia et al. (2015), aiming to study the relationship between EI and intrinsic emotion regulation processes and the moderating effects of EI streams and EI branches in EI/intrinsic emotion regulation link. The cross-sectional study from Chapter 3 explored the associations between ability EI and extrinsic emotion regulation, which has never been studied before. A summary of Chapters 2 and 3 will be provided in the paragraphs below.

Chapter 2 provided two key steps forward for the research literature on EI and emotion regulation. First, I developed a taxonomy of emotion regulation processes by synthesizing processes assessed in the commonly used measures of emotion regulation. Such an over-arching framework will enable future researchers to synthesize emotion regulation research to address different questions (not just about the EI/emotion regulation relationship). In a complex literature of evolving theories, a synthesising framework is an important step forward for understanding the literature as a whole. Second, my meta-analysis built upon Peña-Sarrionandia et al.'s (2015) meta-analysis by considering both (1) the effects of both the test formats and the theoretical models of EI measurements (i.e., the three EI streams); and (2) the different branches of ability EI.

There were three major findings of the meta-analysis. First, EI showed positive relationships with three putatively adaptive processes (direct situation modification, positive reappraisal, and seeking help) but negative relationships with three putatively maladaptive processes (avoidance, expressive suppression, and self-blame). Second, the streams of EI

assessments significantly moderated the EI/intrinsic emotion regulation link for some of the regulation processes (direct situation modification, acceptance, positive reappraisal, seeking help, and distraction), where: a) ability tests (Stream 1) showed weaker relationships compared to the rating scales (Streams 2 and 3), and b) self-rated EI (Stream 2) showed stronger relationships compared to mixed EI (Stream 3). Third, the branch of ability EI significantly moderated the EI/intrinsic emotion regulation link for two regulation processes (direct situation modification and seeking help), where emotion management showed stronger effect as compared to emotion perception. While total scores on ability EI were not significantly related to *any* regulation process, the emotion management branch showed a significant association with greater direct situation modification and seeking help, and lower avoidance. It is clear from such results that ability EI is not a unitary construct, suggesting that researchers should be reporting results disaggregated by branch, and practitioners should focus on the relevant EI branch for the outcome they are targeting.

In the cross-sectional study presented in Chapter 3, the associations between ability EI and extrinsic emotion regulation processes, as well as associations from EI branches, were examined. There is no prior research on ability EI and extrinsic emotion regulation. Correlational and regression analyses were conducted. The cross-sectional study had two major findings. First, total EI showed significant positive correlations with extrinsic regulation processes that involve high cognitive engagement (reappraisal) or high emotional engagement (receptive listening and valuing) with others' emotions, but significant negative correlations with extrinsic regulation processes that involve low cognitive engagement (downward social comparison) or low emotional engagement with others' emotions (expressive suppression). Second, emotion management emerged as the most important predictor among the four EI branches when predicting extrinsic regulation processes. Only emotion management significantly predicted downward comparison, receptive listening and

valuing, and only emotion management and understanding significantly predicted expressive suppression. The findings suggest that the drivers of the ability EI/extrinsic emotion regulation link could be the cognitive/emotional investment required from the regulator and the emotion management branch from ability EI.

4.1. Implications

EI and Intrinsic Emotion Regulation

The results of meta-analysis from Chapter 2 provided three drivers in the associations between EI and intrinsic emotion regulation: (1) the putative adaptiveness of intrinsic regulation processes, which influences the directions of the EI/intrinsic emotion regulation associations; (2) the test formats and the theoretical models of EI measurements (EI streams); and (3) the specific components of ability EI (EI branch).

The putative adaptiveness of intrinsic regulation processes. The results suggest that high EI is associated with more frequent use of putatively adaptive intrinsic regulation process (direct situation modification, positive reappraisal, and seeking help) but less frequent use of putatively maladaptive intrinsic regulation processes (avoidance, self-blame, and expressive suppression). This finding corroborated with the solid relationships found between EI and positive psychological or life outcomes (e.g., Martins et al., 2010; Schutte et al., 2007). This suggests that emotion regulation could be the pathways through which EI (capacities or characteristics that people possess) exerts positive influence on psychological or life outcomes, as some intrinsic regulation processes are putatively adaptive to well-being, whereas some other intrinsic regulation processes are putatively maladaptive to well-being.

Furthermore, the positive associations between EI and putatively adaptive regulation processes also suggest that emotionally intelligent people tend to regulate their own emotions by using antecedent-focused regulation processes in the temporal process model (Gross, 1998a), as direct situation modification and seeking help (a major component is seeking for

instrumental help to solve the problem) are situation modification processes, and positive reappraisal is a cognitive change process. The negative associations between EI and putatively maladaptive intrinsic regulation processes suggest that emotionally intelligent people are less likely to avoid the emotional situation (avoidance), blame themselves (self-blame), or suppress expression of emotions (expressive suppression). Overall, emotionally intelligent people tend to be the master of their own emotions, by either actively engaging in solving the problems (direct situation modification and seeking help) or actively changing their mindset towards the emotional situations (positive reappraisal).

Moderating effects of EI stream. The results suggest that EI stream significantly moderates the links between EI and some intrinsic regulation processes (direct situation modification, acceptance, positive reappraisal, and distraction). Specifically, the associations are stronger for rating scales of EI (Stream 2 and 3) than ability tests (Stream 1), and stronger for self-rated EI (Stream 2) than mixed EI (Stream 3). As this meta-analysis only included studies where intrinsic emotion regulation was measured by rating scales, the higher correlations between intrinsic regulation and rating scales of EI (Stream 2 and 3) corroborated arguments that variables measured by the same test-formats show higher correlations (MacCann, Jiang, et al., 2020). This is because similar mental processes are involved in evaluating the individuals' performances when using similar test formats (Brackett et al., 2006), that self-rated scales of EI reflect their self-report emotional abilities (Furnham & Petrides, 2003; Petrides & Furnham, 2003) and self-rated scales of emotion regulation reflect their self-report tendency of using emotion regulation processes in non-specific situations.

The stronger associations found in self-rated EI (Stream 2) compared to mixed EI (Stream 3) can be further supported by the similarity of contents of the measurements (MacCann, Jiang, et al., 2020). Because self-rated EI tests measures individuals' self-report

emotional abilities (emotion perception, emotion facilitation, emotion understanding, and emotion management), the construct is conceptually more similar to emotion regulation than mixed EI, where EI is measured as a broad set of personality, affect, and social skills which are related to emotions (Ashkanasy & Daus, 2005). The strongest relationships found between self-rated EI and emotion regulation, among the three EI streams, also suggest that *emotional self-efficacy* could be an effective predictor of emotional behaviours. Self-rated EI reflects the extends to which the individuals believe in their abilities of perceiving, using, understanding, and managing emotions, whereas emotional self-efficacy reflects one's beliefs about one's emotional capabilities, both of which could influence one's emotional intentions and behaviours (Sadri & Robertson, 1993; Schwarzer & Fuchs, 1996).

Moderating effects of EI branch. The results suggest that EI branch significantly moderates the links between EI and some intrinsic regulation processes (direct situation modification and seeking help). Specifically, significant differences were only found between emotion management and emotion perception, and emotion management showed stronger effects. The findings corroborated with previous findings that emotion management showed strongest relationship with positive affect and workplace performance (Joseph & Newman, 2010; MacCann, Erbas, et al., 2020). Previous research argued that there is hierarchy of emotional abilities within the four-branch model, where the abilities of emotion perception form the basis of the abilities of emotion management (Joseph & Newman, 2010; Mayer et al., 1999). The findings from the current meta-analysis support this hierarchy of emotional abilities in terms of the differences between emotion perception and emotion management, but also suggest that emotion facilitation, emotion understanding, and emotion management are not different in relationships with what people do to regulate emotions. However, although the meta-analysis found no significant difference between emotion management and facilitation, emotion management was significantly related to three different regulation

processes (direct situation modification, seeking help, and avoidance) whereas facilitation was only related to one (avoidance) and emotion understanding was only related to one (distraction). The argument from the general introduction that emotion management is a key ingredient of ability EI in relationships with emotion regulation could be supported by the findings.

EI and Extrinsic Emotion Regulation

The results of cross-sectional study from Chapter 3 demonstrated two major findings. First, when regulating others' emotions, emotionally intelligent people tend to use high cognitive engagement (reappraisal) or high emotional engagement (receptive listening and valuing) processes to regulate others' emotions, but are less likely to use low emotional engagement (downward comparison and expressive suppression) processes to regulate others' emotions. Second, the emotion management branch of the four-branch model largely accounted for the relationships between ability EI and each of the extrinsic regulation processes (except for expressive suppression, where emotion understanding also made a major contribution).

The results indicate that ability EI is related to the level of engagement with target's emotions, which can be either cognitive or emotional. Downward comparison and positive reappraisal are both 'cognitive change' regulation processes as both change the way that the target thinks in order to change the way that they feel. Positive reappraisal involves the regulator actively collecting and analysing emotional information from the target, and helping the target to have an alternative interpretation of the emotional situations. Downward comparison involves the regulator identifying the target's negative emotions, and directly ordering the target to change their mindset. This requires a lower level of cognitive engagement. The opposite directions of reappraisal and downward comparison in their relationships with ability EI (positive for positive reappraisal but negative for downward

comparison) indicated that emotionally intelligent people have the willingness to invest more cognitive resources to the target's emotional information and to the alteration of target's mindset towards emotional situation.

Furthermore, as the largest associations between EI and extrinsic regulation processes were found in two 'response modulation' processes (negative for expressive suppression but positive for receptive listening), this suggests that EI abilities are more related to *emotional* engagement with target's emotions than *cognitive* engagement with the appraisals that produce the target's emotions. Emotionally intelligent people are more willing to approach or involve themselves in others' discussion of emotions (high receptive listening) and to approach or accept others' negative expressions of emotions (low expressive suppression). The findings align with Mayer's (2002) descriptions of high EI people: a) having strength in identifying emotions from others' facial expressions (high emotion perception), b) being open to others' emotional experience and are empathetic (high emotion facilitation), c) having high emotional insight of others' emotional chains and compound emotions (high emotion understanding), and d) being able to empathize with others' feelings and having strong interpersonal skills to encourage others to safely express emotions by conveying their understanding (high emotion management).

4.2. Limitations and Future Directions

An important limitation of the meta-analysis is the limited diversity of intrinsic emotion regulation processes and EI measurements explored by previous empirical research. This resulted in two insufficiencies in the current meta-analysis. First, though a classification scheme for common intrinsic emotion regulation processes were summarized, not all of these regulation processes could be examined in their associations with EI due to the insufficient number of effects between EI and distancing, deep acting, denial, catastrophizing, rumination, other-blame, self-blame, surface acting, use of substances, venting, restraint

coping, distraction, religious coping, and humour. Second, the moderating effects of EI stream and EI branch were not tested in relationships between EI and all of the intrinsic regulation processes because the small number of effect sizes resulted in uninterpretable RVE results (Fisher & Tipton, 2015). Therefore, future empirical research could adopt a wider diversity of intrinsic emotion processes to test the association with EI and other relevant person-factors. This would allow for more complete analyses of the associations between EI and intrinsic emotion regulation.

Second, both the meta-analysis (Chapter 2) and cross-sectional study (Chapter 3) only included self-rated measures of intrinsic/extrinsic emotion regulation, which reflect individuals' subjective evaluations of their general tendency about the processes that they adopt to regulate their own/others' emotions in non-specific emotional situations. Future research could consider assessing emotion regulation using alternative formats, such as experience sampling, informant-reports of the regulation processes, or behavioural observation and coding. Such a triangulation of alternative methods would allow researchers to draw stronger conclusions that are less susceptible to method effects and self-report biases. For empirical research on extrinsic emotion regulation, future research could employ an objective approach to measure extrinsic emotion regulation based on objective behavioural indicators. Furthermore, as self-rated measures of emotion regulation only reflected a general tendency, future research could also consider the contextual factors of intrinsic/extrinsic emotion regulation (e.g., the identity of the target person, the closeness of the target/regulator relationship, the type and intensity of emotion the target is feeling, the inter-dependency between target and regulator, and potentially the emotion regulation goal). As argued by Bonanno and Burton (2013), emotion regulation processes are not purely adaptive or maladaptive but instead, the effectiveness of emotion regulation is context-dependent. Therefore, including contextual factors in the study on EI and emotion regulation would

contribute more to our understanding of EI and effective intrinsic/extrinsic emotion regulation.

Third, the meta-analysis indicated that *emotional self-efficacy* (one's beliefs about ones' emotional capabilities) could possibly influence individuals' intentions and behaviours of emotion regulation. Such emotional self-efficacy can be applied in both intrapersonal and interpersonal contexts, that individuals' beliefs about their capabilities of regulating their own emotions and regulating others' emotions could be potential predictors of their use of intrinsic/extrinsic emotion regulation processes. Future research could consider study the effects of emotional self-efficacy in both intrapersonal and interpersonal contexts.

Fourth, the approaches used to categorize processes in intrinsic emotion regulation based on their adaptiveness suggest that future research could also look at the adaptiveness of extrinsic emotion regulation. Emotion regulation processes can be grouped based upon their attributes across various dimensions. In this thesis, extrinsic emotion regulation processes were categorized based on the levels of engagement with others' emotions involved in these processes. Though there is limited empirical evidence for categorization of extrinsic emotion regulation processes based on their adaptiveness, future research could link extrinsic emotion regulation and positive outcomes such as mental and physical health, personal well-being, relationship quality, etc. to study the adaptiveness of these processes in interpersonal contexts. 4.3. Concluding Statements

EI and emotion regulation are two traditions that have been generally adopted to study emotions. EI encompasses the capacities or characteristics that people have, and emotion regulation refers to the specific processes that people employ to regulate emotions. The current thesis examined the relationships between EI and two types of emotion regulation: intrinsic emotion regulation (regulating one's own emotions) and extrinsic emotion regulation (regulating others' emotions). The thesis has extended previous meta-analysis on EI and

intrinsic regulation by demonstrating the moderating effects from EI stream and EI branch. The analyses showed three contributors to the EI/intrinsic emotion regulation links: putative adaptiveness of intrinsic regulation processes, the test formats and theoretical models of EI measurements (EI stream), and the specific components within EI models (EI branch). The thesis has also examined the relationships between ability EI and extrinsic emotion regulation, which has not been studied before. The analyses demonstrated that people with stronger EI abilities tend to involve more cognitive and emotional engagement with others' emotions, and emotion management from ability EI is a major driver in ability EI/extrinsic emotion regulation links. Overall, when regulating one's own emotions, emotionally intelligent people tend to either solve the problems (direct situation modification and seeking help) or change their mindset towards the situations (positive reappraisal); when regulating others' emotions, emotionally intelligent people tend to either engage cognitively in the target's emotional information (positive reappraisal) or engage emotionally in the target's verbal descriptions of their emotions (receptive listening). EI stream and EI branch have effects in associations between EI and intrinsic/extrinsic emotion regulation.

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APPENDIX

Characteristics of all Data Sources Meeting Inclusion Criteria

Authors (Year)	*N*	*k*	Country	Publication type	EI Stream	ER process
Abdo (2011)	266	2	USA	dissertation	3	DSM, PRE
Alumran and Punamäki (2008)	312	2	Bahraini	article	3	SH, DSM
Austin et al. (2008)	285	2	UK	article	3	SA, DA
Austin et al. (2010)	475	3	Canada	article	3	DSM, DISTRA
Barnett (2011)	204	2	USA	dissertation	3	DSM, DISTRA
Beath et al. (2015)	423	15	Australia	article	2, 3	SH, HU, REL, PRE, ESP
Bogs (2011)	99	3	USA	dissertation	1	AV
Bucich and MacCann (2019)	84	10	Australia	article	1, 2	DSM, DISTRA, RUM, PRE, SH
Choi (2015)	274	2	South Korea	article	2	SA, DA
Choi et al. (2019)	344	2	South Korea	article	2	DA, SA
Choi et al. (2011)	823	12	USA	article	2	DSM, DISTA
Costa et al. (2018)	206	9	Italy	article	3	SB, AC, RUM, DISTRA, DSM, PRE, CA, OB
Curci et al. (2013)	125	80	Italy	article	1	DISTRA, SH, PRE, DSM, HU, AC, REL, DE, USUB, AV, VE, SB, ESP
Davis and Humphrey (2014)	1170	6	UK	article	1, 3	SH
Davis and Humphrey (2012)	772	6	UK	article	3	SH
Double et al. (2022)	165	8	Australia	article	1	DSM, DISTRA, RUM, PRE
Double et al. (2022)	179	10	Australia	unpublished	1	PRE, ESP
Extremera et al. (2020)	378	45	Spain	article	1	SB, RUM, CA, OB, AC, DISTRA, DSM, PRE
Filippello et al. (2018)	311	9	Italy	article	3	SB, AC, RUM, DISTRA, DSM, PRE, CA, OB
Gerits et al. (2004)	380	14	Netherlands	article	3	DSM, DISTRA, AV, SH, AC, VE, PRE

Goldenberg (2004)	223	12	Canada	dissertation	1	DSM, AV, RC, SH
James et al. (2012)	150	1	Australia	article	2	AV
Kafetsios and Loumakou (2007)	475	3	Greece	article	3	PRE, ESP
Ke and Barla (2020)	142	2	Singapore; UK	article	3	SH, AV
Kerns et al. (2014)	54	25	USA	article	1	PRE, ESP, DSM, RC, AC
Kim and Agrusa (2011)	385	2	USA	article	2	DSM, DISTRA
Kim and Han (2015)	219	3	South Korea	article	2	DSM, SH, AV
Laborde et al. (2014)	291	2	Ecuador & Spain	article	3	DSM, DISTRA
Laborde et al. (2015)	96	2	Germany	article	3	DSM, DISTRA
Lao (2020)	92	8	Australia	dissertation	1	RUM, DISTRA
Lapomardo (2018)	117	3	USA	dissertation	1	AC, RC, DSM
Lloyd (2011)	128	14	USA	dissertation	3	DISTRA, DSM, DE, USUB, SH, AV, VE, PRE, HU, AC, REL, SB
Louvet and Campo (2019)	75	2	France	article	3	DSM, DISTRA
MacCann et al. (2011)	159	8	USA	article	1	DSM, AV
MacCann et al. (2022)	80	4	Australia	unpublished	2	DISTRA, ESP, PRE, RUM
Manicacci et al. (2019)	275	2	France, Canada, Belgium	article	2	SH
Markiewicz (2019)	104	4	Poland	article	2	DSM, DISTRA
Matteson (2014)	1108	2	USA	article	1	SH
Matthews et al. (2006)	200	10	USA	article	1	DSM, DISTRA
Mavroveli et al. (2007)	254	14	Netherlands	article	3	DSM, DISTRA, AV, SH, AC, VE, PRE
Megías-Robles et al. (2019)	712	10	Spain	article	1	PRE, ESP
Mestre et al. (2017)	164	9	Spain	article	1	SB, AC, RUM, DISTRA, DSM, PRE, CA, OB

Meyebovsky et al. (2021)	464	3	Argetina	article	1	AC, DSM, RC
Mikolajczak et al. (2007)	124	2	Belgium	article	3	SA, DA
Mikolajczak et al. (2008)	203	9	Belgium	article	3	AC, DISTRA, DSM, PRE, SB, RUM, CA, OB
Mikolajczak et al. (2009)	490	3	UK	article	3	DSM, DISTA, AV
Monaci et al. (2013)	198	4	Italy	article	2	AV, SH, DSM, VE
Moradi et al. (2011)	200	4	Iran	article	2	DSM, PRE, SH, ESP
Moran (2019)	78	65	USA	dissertation	1	PRE, DISTRA, VE, SH, DSM, DE, REL, AV, RC, AC
Nogaj (2020)	354	1	Poland	article	2	DISTRA
Nozaki (2018)	766	12	USA	article	2	PRE, ESP
Purkable (2003)	50	40	USA	dissertation	1	DSM, PRE, SH, AV, AC, DISTRA, VE
Reynolds and O'Dwyer (2008)	65	20	USA	article	1	DSM, PRE, SH
Rowland et al. (2013)	58	9	Australia	article	1	RUM, PRE, OB, AC, CA, DISTRA, DSM, SB
Saklofske et al. (2007)	362	1	Canada	article	2	DSM
Sarabia-Cobo et al. (2017)	92	7	Spain	article	2	DSM, AC, PRE, VE, DISTRA, SH, REL
Siegling et al. (2015)	645	2	Canada	article	3	DSM, DISTRA
Szczygieł (2018)	180	2	Poland	article	3	DA, SA
Thomas et al. (2017)	141	1	USA	article	2	SH
Thomas et al. (2020)	225	5	USA	article	2	AC, DISTRA, DSM, PRE
Sanchez-Ruiz et al. (2020)	201	1	Lebanon	article	3	PRE
Tsarenko and Strizhakova (2013)	252	3	Australia	article	2	DSM, SH, DE
Tur-Porcar et al. (2019)	434	1	Spain	article	3	AV
Xiao et al. (2022)	306	18	Australia	unpublished	1, 2, 3	PRE, ESP
Zeidner and Hadar (2014)	182	4	Israel	article	1, 2	DSM, DISTRA
Zhang et al. (2004)	1281	4	China	article	2	SH, DISTRA, VE, ESP

Zomer (2012)	300	12	Canada	dissertation	2	DSM, AC, DE, USUB, REL, HU

Note. N = number of participants (if multiple samples in the paper/source, N Iis the average); *k* = number of correlation coefficients; Stream = 1 (ability EI), 2 (self-rated EI), 3 (mixed EI); AC = Acceptance, AV = Avoidance, CA = Catastrophizing, DE = Denial, DA = Deep acting, DSM = Direct situation modification, DISTA = Distancing, DISTRA = Distraction, ESP = Expressive suppression, HU = Humour, OB = Other-blame, PRE = Positive reappraisal, RC = Restraint coping, REL = Religious coping, RUM = Rumination, SB = Self-blame, SH = Seeking help, SA = Surface acting, USUB = Use of substances, VE = Venting.