Chapter 1  Introduction

To be able to choose objects that will interest and hold the attention of the child is to
know the means of aiding it in its mental development. (Montessori 1993 [1915], p. 159)

1.1 A Montessori classroom

To begin, let us picture a classroom for young children. This is not the iconic, colour-
drained classroom represented so often in Western culture, in print and on film, where we
expect to find passive children seated in rows, books and pencils ready on their desks,
while at the front a teacher, stereotypically kindly or stern, delivers the lesson from a
book or a blackboard. Nor is it a contemporary early childhood classroom, with active
children playing in bright surroundings, where we expect to see finger paints, water play,
modelling clay, percussion instruments, story-telling and solicitous adults competing for
the children’s attention, alongside a multi-coloured kaleidoscope of toys and games
spilling out of baskets and crates.

Instead, let us picture a classroom somewhat different from these familiar images. The
design of this classroom follows principles proposed, early last century, by the Italian
educator, Dr Maria Montessori. These principles were derived from Montessori’s
experience working as a paediatrician and an educator in the slums of Rome. These same
principles still apply today in Montessori classrooms across the world.

A visitor to a Montessori classroom, or more accurately, a Montessori environment, notices
that the walls of the room are lined with open shelves. The height of the shelves is determined
by the age of the children who use the classroom. Displayed on the shelves, carefully ordered
and each in its own place, is a collection of objects. Children are absorbed in using these
objects, selecting the objects from the shelves, taking them to a mat or small table, and
working with them as long as they wish before returning them to the shelf, adults
unobtrusively demonstrating and intervening where needed. The objects appear, at first
glance, to be simple in design, yet the semiotic intricacy of these objects is the focus of this
study.
The objects attract the attention of anyone entering a Montessori classroom. From the perspective of children entering the room, the objects stand out because they are placed in the centre of the children’s field of vision and within easy reach. From the perspective of adults, the objects stand out because their qualities and characteristics are similar to, but do not exactly match, the experience most adults have of classroom teaching materials.

The objects have a sensory appeal, varying in colour, shape, size, texture, and possibilities for manipulation. Contrasts in colour and shape are clear and unambiguous; sizes and textures differ in ordered ways. The array of sensory contrasts, however, suggests purposeful variation, rather than a random placement of brightly coloured objects to appeal to immature minds. Each set of objects occurs only once, or very occasionally there may be two or three, but there are no class sets.

The first objects to catch the eye are obviously made by expert woodworkers, or similar artisans. They are crafted from wood, coloured beads, high quality metal and plastic. They are shaped with precision and are graded in size in relation to each other; the colours are pure, bright and clearly delineated.

Other objects on the shelves are made by the teacher, from designs handed down over decades and handed over during training. These materials are generally made from paper or cardboard, then laminated for durability. They comprise, for example, colour-coded sets of pictures and labels, charts and booklets. Often the teacher-made materials are customised for the students, for example, to account for the school community, the contents of the classroom, local geography, flora, fauna or culture.

From the perspective of both child and adult, each object has the potential for interaction, each object demands a response. Some objects stand on the shelf, inviting the observer to pick them up, to touch a shape or a surface, to replace a shape into a frame, to feel the weight lying in their hand, to move parts around, to try out new configurations. Other objects are stored inside baskets or open wooden boxes, inviting the observer to look inside, to take them out and to discover what it is they actually do. Contemporary English-speaking Montessori teachers tend to call these objects ‘the materials’, although when the objects were first designed during the first half of the twentieth century, they were more often referred to as ‘the
apparatus’. Whatever Montessori teachers have called these objects over the last hundred years, they have never called them ‘toys’.

The objects found in a Montessori classroom are the topic of this study. They have a history and a context, which have influenced their design. The design, most significantly however, has a pedagogic motivation. These objects are designed to capture and to hold the attention of children in the service of their education. It is the purpose of this study to explore whether the design of the objects embodies semiotic qualities, with the potential to structure children’s attention in a way that orients them to the meanings of educational knowledge. Specifically, the study will locate these objects in their historical context, propose some generalised design principles, investigate the design and use of one particular selection of these objects, evaluate their semiotic potential as educational artefacts, and propose future possibilities for research.

1.1.1 The Montessori objects

Some of the objects in Montessori classrooms were first designed by Maria Montessori in Italy a century ago. Their provenance stretches back a century before that to France at the turn of the nineteenth century. Today, at the beginning of the twenty-first century, these objects continue to be used daily in thousands of Montessori classrooms across the world. The story of these objects, and their designer, is an intriguing tale. Although it is beyond
the scope of this study to do justice to the story of Montessori’s life, the history of her ideas or the extent of her life’s work, some key elements of the story will be reviewed because Montessori’s contribution can only be appreciated once it has been located in its historical context. This is not to suggest that the objects in Montessori classrooms are only of interest as historical artefacts. Their continued and widespread use in contemporary Montessori schools demonstrates that there are many who believe in the enduring educational value of these objects.

The present study proposes that the resistance of the objects to obsolescence can be traced to the principles of the objects’ design and use. The origins of those principles are found in Montessori’s historical context and, from that time, were largely quarantined from the succession of conflicting ideas which dominated educational thinking in the twentieth century. The ebb and flow of the dominant ideas, however, have circumscribed both advocacy and criticism of the Montessori approach since its inception, obscuring, as a result, the nature of Montessori’s distinctive contribution to education in general and pedagogy in particular. This study aims to make Montessori’s distinctive contribution visible by examining the design of the objects from the perspective of the educational meanings they encode for the children who use them.

1.2 Maria Montessori and her legacy

1.2.1 Montessori’s life and work

Maria Montessori lived a long and eventful life. She was born in Italy in 1870 and died in the Netherlands in 1952. By the end of her life she had designed a detailed educational method and had founded a movement to support its dissemination. The method and the movement bear her name.

Contemporary English-speaking readers know of Montessori’s life primarily through two biographies. The first, written by a close collaborator, E. M. Standing, was published in 1957, five years after Montessori died. This was an official biography, some of it based on the memoirs of one of Montessori’s earliest and closest confidantes, Anna
Standing’s biography is a glowing endorsement of Montessori’s work, and includes much which borders on hagiography. The introduction to the 1962 American edition even warns the reader to ‘beware of Standing’s own infectious attitude’ (McDermott 1962, pp. xiv-xv). Nevertheless, Standing provides helpful detail, unavailable in other published sources, about the genesis of the iconic Montessori materials and their use. It is also a source of many of the anecdotes that have become a part of the Montessori tradition.

A more often-cited biography of recent decades, by Rita Kramer, first appeared in 1976. Kramer’s biography presents a more critical stance. It establishes a broader historical context for the genesis of Montessori’s ideas and a more detailed account of her nomadic and often dislocated life. Kramer (1978 [1976], pp. 24-34) offsets the apocryphal accounts of Montessori’s early life with well-researched historical detail. The young Montessori is described as a strong-minded and determined child. She did well at school without enjoying it very much, resolving at an early age never to be a teacher. Montessori excelled at mathematics, and, unusually for a girl at that time, attended technical school. She planned first to be an engineer, but eventually decided to become a doctor. She completed her undergraduate science degree in 1892 to a standard which made her eligible to enter the Medical College of Rome, but, as it was unheard of for young women in Italy to study medicine, this seemed impossible.

Overcoming formidable opposition, Montessori did manage to enrol as a medical student. She characteristically achieved this goal through persistence, determination, the bending of rules and appealing to those with influence, in this case, so the story goes, Pope Leo XIII. There were further challenges once Montessori’s medical studies began (Kramer 1978 [1976], pp. 35-50), including the opposition of her father who chaperoned her, as propriety required, to and from university but in silence, the ridicule of the male students.

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1 Anna Maria Maccheroni met Maria Montessori as a student in Rome in the first decade of the twentieth century, when she attended Montessori’s lectures on pedagogy. Maccheroni dedicated her life to teaching in Montessori’s schools and developing Montessori curriculum. In particular, she is remembered for her contribution to the Montessori music curriculum. At the end of her life, Maccheroni lived and worked in the United Kingdom, writing and publishing her memoir, A True Romance: Dr Maria Montessori as I knew her, in Edinburgh in 1947.

2 See also Kramer 1978 [1976], p. 11.
and the misery of doing anatomy alone with cadavers at night because a respectable woman could not study this subject in the presence of men. Yet, according to contemporary reports, Montessori always remained charming and gracious. Montessori specialised in paediatrics and psychiatry, won academic prizes and established contacts with royalty and other people of influence, contacts she would later draw on to support social programs, including her schools.

On graduating as a doctor in 1896, the first woman in Italy to do so, Montessori was sought after as a speaker at women’s congresses across Europe. As a young graduate, she worked as a clinician in the field of family medicine especially among the socially disadvantaged, developing a special interest in retarded and disturbed children. Such children, in that era, were labelled ‘deficient’ or ‘idiots’. Children described as ‘deficient’ or ‘idiots’ in Europe at the turn of the twentieth century were, according to Kramer (1978 [1976], p. 73):

… a mixed bag we would probably identify today as the retarded (both organically impaired and the victims of severe poverty and cultural deprivation), the emotionally disturbed, the delinquent.

Through her work with such children Montessori was drawn to the field of education because of her belief, completely out of step with her time, that ‘mental deficiency presented chiefly a pedagogical, rather than mainly a medical problem’ (Montessori 1964 [1909/1912], p. 31). ³

Montessori’s work with ‘mentally-deficient’ children led her to attend courses in pedagogy at the University of Rome and to read widely in the field. In Italy at that time pedagogy was an off-shoot of anthropology, rather than psychology. Italian anthropology of the era is described by Kramer (1978 [1976], p. 68) as a positivist science, which observed, measured and classified humans. Montessori’s subsequent work in an institute for ‘deficient’ children combined detailed anthropological observations and measurements with pedagogical innovations from her own and earlier eras. As a result of Montessori’s unorthodox methods, her ‘deficient’ children began to succeed in state

³ Montessori (1964 [1912], p. 32) first expressed this opinion in ‘an address on Moral Education at the Pedagogical Congress of Turin in 1898’. Kramer (1976, pp 72-88) discusses this very influential lecture at length, and a subsequent series of lectures which Montessori delivered across Italy and Europe.
examinations to levels commensurate with ‘normal’ children in state-run schools. Montessori was soon appointed the institute director and became recognised across Europe as an authority in her field.\(^4\)

During this period, between 1898 and 1901, Montessori’s son, Mario, was born (Kramer 1978 [1976], pp. 91-93). Montessori and the child’s father, a medical colleague at the institute, never married, so the child was kept secret until he came to live with Montessori as an adolescent. Mario Montessori eventually became his mother’s closest collaborator, contributing significantly to the development of the Montessori curriculum, and becoming a leading figure in the Montessori movement.

In the first years of the twentieth century Montessori’s interest in pedagogy increased. She left the institute and returned to the University of Rome to study psychology and anthropology, disciplines at that time still in transition from philosophy and literature to social science. She studied, travelled, published, lectured, and gained a following, as she developed her pedagogical ideas, until in 1907 she was asked to open a school for slum children left unattended while their parents worked as day labourers. Montessori saw this as an opportunity to discover whether the method she used so successfully with ‘deficient’ children could be applied to ‘normal’ children. The school she opened was called the ‘Casa dei Bambini’, or the ‘Children’s House’, and it became the prototype for Montessori schools of the future. The experimental work carried out at that school is recorded by Montessori in *The Montessori Method*. The Montessori movement, as it has become known, derives from the extraordinary worldwide acclaim and fame Montessori achieved on the basis of this work.

Surprisingly, and against the advice of many, Montessori abandoned her medical and academic careers and devoted the rest of her life to developing and promoting her educational method. From the opening of the first Casa dei Bambini in 1907 to the outbreak of World War I, Montessori became world famous, to a degree which was

\(^4\) Schulz-Benesch (1998 [1967]) places much more emphasis than Kramer on the anthropological orientation of Montessori’s educational work.
unusual at the time. Montessori schools appeared across the world, including several in Australia.\textsuperscript{5}

At the height of her fame in 1914, and again in 1915, Montessori travelled to America where she gave public lectures, published articles, ran training courses and opened demonstration classes. She was supported by President Wilson and his daughter, as well as other influential figures such as Edison, Alexander Graham Bell and Helen Keller. After World War I, interest in Montessori schools and Montessori training courses quickly waned in America, but they continued to be popular in the United Kingdom and continental Europe into the 1930s, although Kramer details a litany of reversals of fortune in the Montessori movement itself. Montessori was based for much of that time in Spain, but she travelled constantly to give lectures and train teachers throughout Europe. As Europe descended into war, many of her lectures were on the theme of education and peace.

From the First World War, and throughout the 1920s and 1930s, Montessori had links with the New Education Fellowship, which at the time was working towards the reform of education in Western Europe, the United Kingdom, the United States and beyond. A strong supporter of New Education was William Boyd, the Head of the Education Department at Glasgow University at the time, and one of Montessori’s earliest critics (Boyd 1914). According to Boyd, New Education was based on three essential ideas: ‘wholeness, creativity and the unique value of the individual’ (Boyd and Rawson 1965, p. 191). Boyd describes the initiators of this movement, including Montessori, in the following way:

They are all products of their age, elements in the great movement of social and political reform that started in the closing years of the nineteenth century and sought to restore to the common man some of the freedoms and interests that had been lost to him through the Industrial Revolution (Boyd and Rawson 1965, p. 34).

The ‘activity, self-development and self-discipline’ of Montessori classrooms inspired Beatrice Ensor to found the New Education Fellowship in 1915 (Boyd and Rawson 1965, p. 191).

\textsuperscript{5} For a history of Montessori education in Australia from 1909 to the 1980s, see Petersen (1983).
By the 1920s the New Education Fellowship had become, as Kramer (1978 [1976], p. 306) describes:

... a prestigious organization of educators from all over the world ... spreading the word about philosophies of learning and methods of teaching that their devotees hoped could effect reform that might contribute to international understanding and help maintain the increasingly precarious troubled peace of the world.

Most British schools aligned with the New Education Fellowship initiated their program with Montessori nursery schools (Boyd and Rawson 1965, p. 6). There were also Montessori schools and training centres in Spain and France. A vibrant Montessori movement was a part of the social reform movement which so optimistically flourished in Vienna from the early 1920s until the 1930s (Gardner and Stevens 1992, pp. 102-104; Kramer 1978 [1976], p. 285). A Montessori-trained teacher, also a student of Karl Bühler, established a workers’ collective of young socialist women who opened a Montessori school for the poor. Montessori schools quickly spread until they were available to all levels of Viennese society. One of the Viennese schools was custom-built by a Bauhaus architect. Supporters of the Montessori schools in Vienna included members of Freud’s circle. According to Kramer (1978 [1976], p. 321), when members of this circle, many of them Jewish, fled Vienna in the 1930s, they took psychoanalysis and ‘a significant residue of Montessori’s thinking, if not her name’ to England and the United States. In the 1920s and 1930s the Montessori method also flourished in Italy under Mussolini until, in 1934, Montessori refused to allow children in her schools to wear fascist uniforms. By the end of the 1930s Montessori and her family, which now included five grandchildren, had retreated to the Netherlands, where her method had institutional, as well as popular, support.

From the Netherlands, in 1939, at the invitation of the Indian poet, Rabindranath Tagore, Montessori and her son travelled to India, where they were interned at the outbreak of World War II. Because of Germany’s occupation of the Netherlands, they were unable to return home to Mario’s children until the end of the war. During that time Montessori continued developing her method in India, again with the support of well-known figures,
including Gandhi and Nehru. Montessori schools and training centres remain popular throughout the Indian sub-continent to this day.\(^6\)

After the war Montessori schools began to reopen across Europe and in 1948 she was nominated for a Nobel Peace Prize. Montessori continued working and travelling until her death, aged 82, in 1952. The late 1950s saw renewed interest in Montessori education in North America. The popularity of the method continues in all parts of the world today.\(^7\)

Kramer’s detailed biography provides insights into the way Montessori’s life and work were shaped by the impact on the old order of new ideas and social movements in Europe during the decades which spanned the end of the nineteenth century and the beginning of the twentieth century, as well as the impact of the turmoil in Europe during the first half of the twentieth century. It also provides useful detail on the genesis and history of works published under Montessori’s name, and a distillation of the key elements of Montessori’s life and her contribution to pedagogy in general terms.

Kramer concludes her biography by delivering a strong criticism of the drift in Montessori’s work from innovation to conservatism. Her criticism is captured in the following paragraphs:

> The earliest part of Montessori’s life is more interesting to read, as it was to write, because it is a story of discovery, with all the elements of risk-taking and suspense such a story implies. Then, like her books it becomes repetitious, and somewhat duller, no longer involving new adventures in ideas but only the safeguarding of earlier ones. The movement had become a fortress. It protected those within from external dangers but left them with a rather impoverished set of experiences, seldom seeing new faces, hearing other voices than their own.

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\(^6\) In 1901 Tagore established a Sanctuary School called Santiniketan, or Abode of Peace, along the lines of an ashram. By 1921 Tagore had also established a university with internationalist ideals and an agricultural college to improve rural life in India (Boyd and Rawson 1965, pp. 29-31). Tagore attended the New Education Fellowship Conference in Denmark in 1929, which was held in conjunction with a Montessori Congress. Tagore took the Montessori method back to India, ‘finding it peculiarly adaptable to the all but staggering needs of their huge illiterate, impoverished, agrarian population’ (Kramer 1978 [1976], p. 307; see also pp. 340-347).

\(^7\) The extent of popular interest in Montessori is revealed by searching the word ‘Montessori’ on Google. In June 2005, this resulted in over three million entries, in contrast to entering ‘Piaget’, which resulted in about three quarters of a million entries.
Nothing is as corrupting as worship – unless it is being worshipped. It was Maria Montessori’s fate that she reached a point at which she stopped growing intellectually and instead retreated into the church her disciples had built around her in the later years of her life. She never really confronted the challenges of new ideas in fields as close to her own as psychoanalysis, anthropology, and linguistics. (Kramer, 1978 [1976], pp. 378-379)

These paragraphs constitute a rather harsh critique. As Kramer’s biography reveals, the ‘external dangers’ Montessori faced during her lifetime included bearing and raising an illegitimate child as a single woman, and later, maintaining a household which included five grandchildren, while at the same time surviving two world wars, an economic depression, oppressive regimes, exile and internment. These same external conditions impoverished the experience of countless women in Europe during Montessori’s era in catastrophic ways. The fact that Montessori established a protective structure to make it possible to continue her work, despite these conditions, can easily be constructed as an achievement rather than a limitation.

In a contemporary review of Kramer’s biography Burstyn (1979, p. 143) recognises that Montessori’s life is ‘a challenge for any biographer’. Nevertheless, Burstyn (p. 144) criticises the biography because of its emphasis on Montessori’s personality ‘at the expense of her ideas’. More specifically, for the purposes of this study, what Kramer fails to account for is the nature of Montessori’s continuing work, after her initial success, albeit within the structures of her ‘movement’. Montessori’s original insights remained central to her work, and indeed, as Kramer observes, many of her publications repeated, rather than expanded, these insights. The challenges posed by the Montessori literature will be reviewed in Chapter 2. Montessori’s material legacy, the materials and activities which constitute her pedagogy, however, indicate that Montessori, after her apparent retreat in the later years of her life, rather than merely safeguarding her earlier ideas, continued the painstaking and detailed task of designing a pedagogy and realising her earlier insights in the form of a complete system of educational practice. Rather than describing this period of her life as a period in which she stopped growing intellectually, it may be equally valid to describe this period of her life as one of elaboration, consolidation and realisation. This study is based on the premise that the detailed realisation of Montessori’s ideas in their material form has never been satisfactorily evaluated outside the Montessori tradition.
The ground, against which Kramer critiques Montessori, has shifted in the nearly thirty years since the biography was written. The valued theoretical frameworks of the 1970s have become the focus of critique and review, just as the theoretical frameworks, through which Montessori’s work was viewed during her lifetime, have themselves been overtaken, developed or renewed. Interestingly, while these theoretical positions have ebbed and flowed, Montessori schools across the world continue to deliver Montessori’s pedagogy, set in aspic as it may be. Kramer (1978 [1976], pp. 373-374) catalogues the general contribution of Montessori’s pedagogic innovations, in particular those naturalised into the mainstream by the 1970s, but her description of the practice of Montessori pedagogy does not recognise the scope, nor the detail, of this legacy.

While recognising the limitations of Kramer’s account, Chapter 3 of this study will expand on Kramer’s general evaluation in order to review Montessori’s material legacy more closely, first in terms of the intellectual and social forces which shaped the initial emergence of her pedagogy and then in terms of the forces which buffeted and bypassed, but never extinguished, the pedagogy as the twentieth century unfolded.

1.2.2 The origins and scope of Montessori’s legacy

As described in the previous section, Montessori’s educational work was built on both academic and clinical foundations in medicine, psychiatry, anthropology and psychology, as these disciplines were conceived at the beginning of the twentieth century. In her work with the mentally deficient, Montessori applied the ideas and methods of two nineteenth century French doctors, Itard, and his student Séguin. Séguin worked as both a doctor and a teacher in insane asylums in the nineteenth century, building on Itard’s ideas, first in France and then later in America. Montessori distilled from the work of these two doctors a pedagogical approach centred on children’s purposeful activity, generated by interaction with carefully-designed learning materials. Montessori (1946, p. 3) describes these materials as ‘motives of cultural activity’. The materials were designed to capture and hold children’s attention. Montessori’s observations convinced her that children’s
spontaneous interest in, and subsequent extended interaction with, these didactic objects resulted in intellectual and social development.

When Montessori reapplied the method she developed for ‘deficient’ children to the teaching of ‘normal’ children, her experiments led her to believe that the method worked more effectively if children freely chose the materials themselves. The teacher’s task became to prepare the materials and then to refrain ‘from obtrusive interference’ in the children’s activity (1946, p. 3). For ‘normal’ children, Montessori (1946, p. 3; emphasis added) believed:

... education is not what the teacher gives; education is a natural process spontaneously carried out by the human individual, and is acquired not by listening to words but by experiences upon the environment.

The terms natural and spontaneous continue to be associated with Montessori’s approach, but, in the elaboration of her proposals, Montessori made it clear that these terms did not mean abandoning children to their own devices. Montessori’s rejection of ‘listening to words’ as a useful component of education, for example, is a response to the enforced silence and passivity of children in the classrooms of her era. In practice, being silent and listening to teacher talk are part of the Montessori approach, but not imposed from outside the child’s frame of reference in harsh and meaningless ways. Furthermore, teacher talk in a Montessori classroom is circumscribed by the principle of economy, also a central design feature of the Montessori learning materials and the teaching approach. This feature is a function of Montessori’s dictum: ‘Needless help is an actual hindrance to the development of natural forces’ (1964 [1909/1912], p. 99).

While keeping constant the design principles developed during her earliest educational experiments, Montessori, with her closest collaborators, expanded the original set of learning materials into a systematic and interrelated array of objects and graded exercises, covering all educational disciplines for children from infancy to the age of twelve years. This system, largely unaltered, continues to be used today in thousands of schools around the world. The origins of Montessori’s method will be examined more closely in Chapter 3 of this study, while the general design features and scope of the Montessori materials will be reviewed in Chapter 6.
1.2.3  Varying interpretations of Montessori’s legacy

As Kramer’s account records, Montessori’s educational ideas and approach have simultaneously generated great acclaim and outright dismissal, throughout her lifetime and beyond. Unlike her contemporaries, Thorndike, Dewey and Piaget, she was not aligned with the emergence of a broad school of thought shaped by scholarly work within the academy. Montessori quite deliberately left her senior university post and her medical career to spread her ideas about education. While Kramer judges this as a move which blinkered Montessori’s outlook, for Burstyn (1979, p. 145), this decision was a strategic one which ‘achieved a social impact far broader than she could ever have had ... as a professor at the University of Rome’. Burstyn (p. 145) claims that Montessori’s approach to broadcasting her ideas was based on ‘her involvement with the worldwide women’s movement’. Burstyn continues:

The political style of the international conference, the exhilaration of meeting people from many countries, the generation of commitment among those present, of faith that they could return home to effect change, these were the characteristics that Montessori recreated in the Montessori movement.

Kramer’s and Burstyn’s differing interpretations of Montessori’s contribution exemplify the whole field of Montessori interpretation. Kramer’s personality-oriented study takes a completely different view of Montessori’s decision to leave her professional and academic life in order to sell, through force of personality alone, her ideas on the international stage to the one taken by Burstyn when interpreting the same events through the lens of the women’s movement.

From the time Montessori’s ideas burst onto the world stage in a blaze of publicity after 1909, her method and her movement have been, and continue to be, variously interpreted from shifting positions. Her first book was enthusiastically received by many social reformers, but at the same time it was criticised by Boyd (1914), the advocate of New Education, as a misreading of Rousseau and Séguin and by an influential American academic as being out of date (Kilpatrick 1915). Despite Montessori’s extended and celebrated trips to the United States and the extensive media coverage they generated, Kilpatrick’s dismissal of her work, combined with the dislocation of the First World War, diminished interest in Montessori in that country after 1915, until a popular revival
occurred in the late 1950s. This revival in the United States led to a worldwide renewal of interest.\textsuperscript{8}

Since that time the Montessori approach has been reinterpreted from a range of different standpoints, as represented by the following sample: education in the tradition of Rousseau (for example, Postman 1999, p. 120; Thomas 1979), progressive education following Dewey (for example, McDermott 1962; 1964, 1965), genetic epistemology following Piaget (for example, Chattin-McNichols 1992, pp. 150-169; Elkind 1974; Norris 1976), cognitive psychology (for example, Hunt 1964; Phillips 1977), the transition from modernist to postmodernist views of childhood and constructivism (Elkind 1998, 2003), social development theory following Vygotsky (Bodrova 2003, Loeffler 2002), and optimal experience, or ‘flow’, theory following Csikszentmihalyi (Kahn 2003, Rathunde 2001, 2003). This diverse selection represents an interesting assortment of perspectives, but one which does not offer a coherent picture of the Montessori approach. A common feature of the literature is a lack of attention to the detail of Montessori’s material legacy, with the exception of one very limited and recent region of the literature, instructional design, especially as it relates to interactive computer technology (Leone 2004a, 2004b; O’Malley and Fraser 2004).

A recent contribution addressing the gaps in the Montessori research literature has been made from the standpoint of developmental psychology in the publication Montessori: The science behind the genius. The stated aim of the author, Angeline Stoll Lillard, is ‘to make Montessori accessible to researchers’ (Lillard 2005, p. ix). The researchers Lillard has in mind are psychology researchers, whose attitudes to Montessori she sums up in the following way:

For psychology researchers, attitudes toward Montessori are mixed: some know enough to appreciate it, others misunderstood a small aspect and dismiss the entire approach. Very few know more than a smidgen about it (Lillard 2005, p. viii).

\textsuperscript{8}In a history of educational ideas published in 2002, Boyd’s 1914 critique of Montessori is still the authority cited to support the idea that the Montessori approach is too rigid and ‘based on a wrong notion of the mental characteristics of a young child’ (Lawton and Gordon 2002, p. 207). There is no mention of the renewed popular interest in Montessori, the increasing numbers of Montessori schools, nor alternative evaluations over the century since Boyd published his views.
To structure her study, Lillard (2005, p. 29) selects ‘eight insights Dr. Montessori derived through her observations of children that undergird her approach to schooling’. Lillard discusses each of these insights at length and reviews the psychological research literature to determine whether each insight is supported, or not, by the evidence. Lillard’s conclusion is that, where Montessori insights have been researched, the literature is supportive, but that there remain key Montessori insights yet to be examined by researchers. Specifically, she recommends research on particular educational outcomes associated with signature Montessori materials (For example, Lillard 2005, pp. 323-324).

Throughout her work Lillard includes extended descriptions of Montessori materials and exercises, demonstrating more knowledge and familiarity with the materials than is usual in Montessori interpretation. She uses these descriptions to illustrate the insights under review. Lillard provides the most current and comprehensive overview available of Montessori education and its position within the North American psychological research literature. Her study, however, maintains the tendency in Montessori interpretation of selecting from the Montessori material legacy to provide incidental illustrations of a catalogue of principles, rather than considering Montessori’s material legacy as a systematic, materialised instantiation of a coherent approach to education.

1.2.4 Locating Montessori’s legacy in the history of educational thought

Describing the Montessori method as having ‘roots deep in history’, Standing (1962 [1957], p. 58) contrasts Montessori’s ‘intellectual genealogical tree’ with Froebel’s. Where Froebel’s ideas can be traced back to Locke via Rousseau and Pestalozzi, Montessori is indebted to a comparatively unknown trio, Pereira, Itard and Séguin. While acknowledging that Montessori, as a lecturer in education for ten years, was clearly very well-read in the ‘mainstream of educational development’ of her time, Standing (1962 [1957], p. 59) points out that ‘the foundation on which her work was based is not the usual one’. A significant task of this study will be to review the unusual foundation of her work (See Chapter 3).
In contemporary histories of education the less well-known aspects of Montessori’s intellectual inheritance are rarely elaborated. She is, rightly, aligned with those educational pioneers who worked to make schools humane environments, responsive to the developmental needs of children. Such proposals trace their origins back to the European Enlightenment of the eighteenth century. While progressivism is the name given to the earlier twentieth century incarnation of Enlightenment ideas, especially as proposed by John Dewey, the term constructivism tends to be applied to more recent interpretations of this ethos. For example, Montessori, Dewey, Piaget and Bruner are all described by Lillard (2005, p. 12) as ‘constructivist’ theorists ‘because they view children as constructing knowledge, rather than simply taking it in ...’. Lillard (2005, pp. 3-12) contrasts constructivism with the ‘empty vessel’ approach associated with the seventeenth century philosopher John Locke and the nineteenth century factory-model of school. These approaches, which rely on rewards and punishments, are represented by Lillard as paving the way for the behaviourism of Thorndike and his followers. This study does not share Lillard’s interpretation of Locke’s proposals and their relation with the twentieth century educators cited above, as will be elaborated in Chapter 3.

Because Montessori has so much in common with the overarching Enlightenment ethos, it is easy to overlook the fact that some of the most influential criticism of Montessori’s pedagogy has come from progressive educators and those who followed in their footsteps. Conversely, renewed popular interest in Montessori’s pedagogy in the middle of the twentieth century was one consequence of waning confidence in the outcomes of progressive education. The revival of Montessori schools accompanied the development of various constructivist approaches loosely associated with Piaget, Bruner and Vygotsky, and the emergence of Skinner’s programmed learning, a reworking of behaviourism. The ideas of Dewey, Piaget, Bruner and Vygotsky, not to mention those of the behaviourists Thorndike, Watson and Skinner, have generated discussion and debate across the last four decades of the twentieth century, and beyond, but, as Lillard (2005, p. 343) points out, ‘... Dr. Montessori’s ideas have still not penetrated psychology and education circles’. 
While the Montessori approach may have had little visible impact on the shape of educational thought over the last century, her work was familiar to Dewey, Piaget and Vygotsky, three of her contemporaries in the Enlightenment tradition, whose ideas have had an enormous influence on educational theory of the last century. The common ground shared by Montessori, Dewey, Piaget and Vygotsky is a view of learning as a developmental process comprising purposeful activity, generated by children’s interest. Each one, however, realises this view in a different way.

John Dewey, a philosopher in the school of American pragmatism, founded by the semiotician C. S. Peirce and the psychologist William James, conceived of progressive education as an approach which established opportunities for children to learn through real-life activities and problem-solving in a democratically-oriented social environment (for example, Dewey and Dewey 1915). The Swiss psychologist, Piaget, on the other hand, is well-known for his theory of child development, which he constructed not primarily to contribute to educational practice but in order ‘to answer questions about the nature and origin of knowledge’ (Elkind 1974, p. 130). In the 1920s, at the same time as Piaget, in Geneva, was working on his developmental theory, in Russia Lev Vygotsky was also theorising about the intellectual development of children. Vygotsky’s theory in some ways can be conceived of as a mirror image of Piaget’s. Where, for Piaget, a child’s construction of knowledge in the social environment happens after the relevant maturation of internal mental structures, for Vygotsky the internal structure of a child’s thought is shaped by interactive experiences in the external social environment. In contrast to Dewey, Piaget and Vygotsky, Montessori realised her developmental activity-based approach to education in the form of the materialised pedagogy which is the focus of this study.

Dewey, Piaget and Vygotsky all cite Montessori’s early work as representative of, or as a precursor to, ideas they promote, yet none of them engage fully with the significance of the materials which encode her ideas. Piaget (1970, p. 148) refers to the Montessori material merely as ‘suitable school equipment’, whereas Dewey and Dewey (1915, p. 141; pp, 157-161) and Vygotsky (1978 [1935] pp. 117-119) acknowledge the value of the material, while criticising key aspects of its use, although from different points of view.
These criticisms will be reviewed in Chapters 3 and 4, as part of a closer investigation of Montessori’s position in the development of educational ideas.

From the time Montessori’s method was first described in English in 1912, a recurring criticism, especially from progressive educators, has been the apparent rigidity of the Montessori approach, as represented by the term ‘method’ and as embodied in the Montessori materials and their use (Kramer 1978 [1976]). This view was reinforced when the advertising of many Montessori schools during the post-1960s revival used the newly-fashionable behaviourist term *programmed learning* to describe what happens in Montessori classrooms, a term some Montessori schools use to this day.

In order to trace the origin of the commonalities, as well as the lack of fit, between Montessori and other twentieth-century educational approaches in the Enlightenment tradition, Chapter 3 looks back towards the Enlightenment era from the transition period between the nineteenth and twentieth centuries, the period in which Montessori first conceived of her pedagogy. Commonalities include the modelling of development as a series of unfolding stages and phases. The lack of fit is most visible in relation to the role of concrete materials in pedagogy. In Chapter 3, Dewey’s perceptive description of the early Montessori materials, and his subtle critique, is reviewed, as well as Piaget’s positioning of Montessori in the pantheon of pioneering twentieth-century educators. Despite a stated admiration for her work, however, Piaget (1970, p. 9) attributes Montessori’s insights merely to ‘her power of intuition ... without [her] ever developing a theory ...’ Lillard (2005, p. 343) elaborates this point when she writes that ‘Piaget ... left a legacy of a carefully crafted, detailed theory [while] the theory is harder to reach in [Montessori’s] work’.

Unlike Piaget, Montessori’s legacy is a carefully crafted, detailed materialised pedagogy. It is interesting to contemplate why this impressive material legacy has come to have much less ‘reality’ in the study of education and pedagogy than Piaget’s theoretical one. Lillard’s point, however, is an important one. Abstracting a set of coherent general principles, much less a theory, from Montessori’s material legacy was not satisfactorily achieved by Montessori herself, nor by those who have come after her. This study turns
to the third of Montessori’s contemporaries discussed above, Vygotsky, for theoretical tools to address this problem.

1.2.5 Re-viewing Montessori’s legacy from a semiotic perspective

Montessori’s materialised pedagogy recasts educational knowledge in the form of concrete objects, which children arrange, and rearrange, in a variety of combinations and configurations. Montessori (1946, p. 12) observed that young children have ‘natural aptitudes to easy acquisition of culture’ so she surrounded children with ‘things to handle which in themselves convey steps in culture’. The Montessori objects, therefore, were designed as artefacts which encode particular types of cultural meanings, especially those valued in education, meanings which can be decoded when children use the objects. The problem for the researcher is to uncover the nature of the cultural meanings encoded by the objects in use, and to determine the potential this mode of encoding has for the development of educational knowledge.

From a Piagetian perspective the Montessori objects encode educational meanings that become accessible after the relevant mental structures have matured in the child’s mind. In other words, a child’s access to the cultural meanings encoded by the objects represents the culmination and verification of internal mental processes (See, for example, Piaget 1970). This genetic trajectory, however, does not reflect either the provenance of the Montessori objects, nor the way they are actually used in classroom practice. The ‘material of development’, Montessori (1965b [1916/1918], p. 67) tells teachers, is ‘necessary only as a starting point’. This material, in the form of sets of objects, is presented to children in order to initiate cycles of developmental activity. When a set of objects is first presented, the teacher shows children how to use it and gives them precise language for talking about it. The objects draw children’s attention to specific cultural meanings by representing those meanings in an accessible form. At first the language merely ‘labels’ the objects, but after extensive, interactive, and largely independent use of the objects, children gain control of the encoded meanings. Extended independent activity is possible because the objects ‘remember’ the meanings for
children, capturing them in material form children can, literally, grasp. While novice
learners grasp and control the objects with their hands, their grasp and control of the
represented meanings is less likely to slip from their minds. Grasping and manipulating
the objects is also an externalisation of a learner’s future ‘mental’ grasp and control of the
meanings.

In a Montessori classroom, children are free to interact with any set of objects until they
master its use, along with control of meaning this use represents. The culmination of a
cycle of activity, and the verification that children have internalised meanings encoded in
a set of objects, occurs when children, in Montessori terms, ‘let the material go’, or, in
other words, when they demonstrate independent use of the cultural meanings, using only
abstract symbols, language and perhaps, for example, mathematical symbols, without any
longer needing the concrete material as a reminder.

The nature of children’s interaction with Montessori objects reveals commonalities with
Vygotsky’s conception of development. These commonalities suggest, for the purposes
of this study, the use of Vygotsky’s framework as a means for generalising from the
Montessori materialised pedagogy. In Vygotsky’s terms, Montessori pedagogy
transforms meanings in the social and cultural environment into external developmental
means (the Montessori objects). The processes of learning about and remembering these
meanings is also transformed into external activity (use of the objects). An external
object, when used to represent a meaning to be remembered, is a sign and the ‘very
essence of human memory consists in the fact that human beings actively remember with
the help of signs’ (Vygotsky 1978, p. 51). Two examples of humans ‘forcing an external
object’ to become a reminder are a knot tied in a handkerchief by an individual and a
monument built by a civilisation. These are two extremes in the range of external objects
humans deploy as signs for the purpose of recalling meanings which are significant,
whether for limited social reasons or expansive cultural ones. The objects in a Montessori
classroom are specialised examples of this distinctively human sign-making activity.

The deliberate use of external objects as signs, in order to capture meanings and hold
them still for reflection and recall, has further significance within Vygotsky’s model of
development. In this model human development is understood as two interwoven trajectories, a biological, or natural, trajectory of developing elementary mental functions, and a social line of development which transforms elementary, or lower, mental functions into higher mental functions of a different order. Recall in its elementary form, as Hasan (2005c, p. 132) explains, is ‘triggered by a chance encounter’, but when an external object is deliberately chosen to stimulate recall ‘the nature of the mental function changes’. The mental function is now ‘socially mediated’. Hasan continues:

Reminding oneself purposefully and consciously by the mediation of some instrument that is within one’s control is a higher and different order of mental function.

Instruments of mediation, or signs, are described by Vygotsky (1978, pp. 52-53) as analogous to, but not the same as, a tool used to transform the nature of physical work. The difference he describes in the following way:

[The tool] is externally oriented; it must lead to changes in objects. It is a means by which human external activity is aimed at mastering [...] nature. The sign, on the other hand, [...] is a means of internal activity aimed at mastering oneself; the sign is internally oriented (Vygotsky 1978, p. 55; emphasis in original).

The analogy between tools and signs is foregrounded when Vygotsky refers to signs as ‘psychological tools’. Analogous and distinguishing characteristics of physical tools and psychological tools, or signs, are conflated in interesting and multiple ways in the Montessori objects, as reflected in Montessori’s description of them as ‘materialised abstractions’ (1982 [1949], p. 162). The objects represent abstract cultural meanings, and therefore, are internally-oriented signs, yet they are concrete objects which function as elements in children’s external activity. Furthermore, the Montessori objects are always used in combination with language (spoken and/or written), an internally-oriented sign system, and with movement, usually of the hand, an external action. Thus, in the design of the objects and activities which comprise her pedagogy, Montessori could be said to have constructed complexes of signs, comprising a rich combination of elements oriented, through multiple modalities, both externally and internally.

The task of this study is to investigate the nature of selected Montessori materials as complexes of signs, particularly the relations between the elements, within and across modalities, and the external and internal orientations of these relations. This analysis will
also be used to explore the source of the developmental power of the objects and the activity they generate.

Mediation by means of signs has become known by researchers using Vygotsky’s theory as *semiotic mediation*. Semiotic mediation is a central theme of this study. It is described by Vygotsky (1978, p. 40) in the following way:

> [t]he use of signs leads humans to a specific structure of behaviour that breaks away from biological development and creates new forms of a culturally-based psychological process.

Usefully, for the purposes of this study, Hasan (2005c, p. 134) elaborates the term *semiotic mediation* as ‘mediation by means of semiosis’, pointing out that ‘semiotic acts are acts of meaning, and meaning can be construed by various semiotic modalities’. The range of modalities through which ‘psychological tools and their complex systems’ can be expressed are listed by Vygotsky (1981a, p. 137) as:

> ... language; various systems for counting; mnemonic techniques; algebraic symbol systems; works of art; writing; schemes, diagrams, maps, and mechanical drawings; all sorts of conventional signs; and so on

Attention is drawn by Hasan (2005c, p. 134), however, to Vygotsky’s conviction that:

> ... amongst the various semiotic modalities language alone maximised the qualities that are necessary for something to function as a psychological tool capable of mediating the development of the mind.

Recognition of the overarching role of language in the process of semiotic mediation determines, for the purposes of this study, the type of analytical framework needed to analyse the Montessori objects in use. The framework must be able to capture, and make visible, linguistic meanings, as well as their analogues in other semiotic modalities, and meaning relations within and across modalities. Combining the use of objects and the use of language, as Montessori pedagogy does, evokes Vygotsky (1978, p. 53) describing Dewey’s definition of language ‘as the tool of tools, transposing Aristotle’s definition of the human hand to speech’. An analytical framework is needed which is capable of revealing the comparable transposition relation between hand and language in the use of the Montessori objects.
Before turning to the analytical framework proposed for this study, it is necessary to mention an important terminological issue. In this section the combinations of objects in use and language in use which defines Montessori pedagogy have been labelled *complexes of signs*, a term used to bind the elements loosely together. At this point in the study, the term *complex of signs* is not defined, however, and serves merely as a place holder. The need for a place holder reveals that a significant theoretical problem to be overcome in the study is the identification of an appropriate unit of analysis. This issue will be examined in more detail in Chapter 5.

1.3 A meta-analytic framework for the study

1.3.1 Examining the design and use of the materials

The most iconic Montessori objects are those designed for children aged from three to six years, designs strongly influenced by Séguin. Montessori (1982 [1949], p. 145) observed that children in this age group had an ‘irresistible tendency to touch everything, and to pause a while on separate things’ and that, therefore, a child ‘needs a world of things which provide him with motives for his activity ...’. On the basis of this reasoning Montessori designed objects which could become motives for activity leading to the development of educational knowledge.

Montessori used a range of terms to identify the objects she designed, for example, ‘materialised abstractions’, ‘material of development’, ‘means of development’, ‘means of auto-education’, ‘didactic apparatus’, ‘cultural apparatus’ and ‘pedagogic instrument’. The objects are designed, according to Montessori (1965b [1916/1918], p. 60; emphasis in the original), to approximate ‘scientific apparatus [...] constructed upon a basis of *exactitude*’, and to ‘make [...] liberty possible’. Throughout her writing Montessori (for example, 1964 [1909/1912], p. 86) equates liberty with activity.

By Montessori’s own account, when she first designed each apparatus, she showed children how to use it and then observed their free activity with the object. On the basis of these observations she adjusted the design. Once she was convinced by her
observations that she had reached a design which generated optimum activity, the design became standardised, ‘... the experimental use by the children [having] determined the quality and quantity of the material’ (Montessori 1997 [1915], p. 13). For this reason, educators in the Montessori movement are reluctant to change the design of these objects, even down to the smallest detail. This reluctance has contributed to the perception that the approach is rigid and inflexible. Yet an analysis of the design of the objects may reveal why Montessori teachers will not change even apparently minor details of the educational artefacts they believe to be developmentally functional.

The design of each Montessori object represents a selection from variables such as colour, shape, size, weight and surface texture. These elements are organised on the basis of precise compositional choices, including relative position and relative salience. The designs also vary as two-dimensional or three-dimensional. The selection and organisation of the design variables are pedagogical choices motivated by a concern with accurately representing educational knowledge and making these meanings accessible to children. Each configuration of design elements in a set of Montessori objects represents a quantum of educational knowledge located in relation to other configurations, in ways which reflect, as accurately as possible, the relations which construct educational meanings. Moreover, the use of each set of Montessori objects is accompanied by a precise use of spoken and/or written language. The way the language is used represents the relations represented in the design of the object. The repetition in the previous sentence draws attention to the layered redundancy which is a feature of the meaning-making potential of the Montessori objects in use.

The problem for the researcher is, first, to capture the relations which hold between the design elements of the objects in use and the relations between the quanta of educational knowledge the objects represent, as these relations are expressed in language. The second phenomenon of interest is the redundancy relation which holds between each object, as materialised abstraction, and the abstract linguistic expression of the educational knowledge it represents. This relation is a function of the re-expression of abstract educational knowledge in concrete form.
The task of this study is to map the relations described above in terms of meaning, in order to reveal the source and to predict the pedagogic force of the Montessori objects in the context of children’s free and independent use of the objects. Because Montessori objects in use are already an analytical move away from the educational knowledge they represent, their analysis demands a meta-analytic framework with the capacity to reveal comparable meaning relations encoded in both material and linguistic form.

To achieve this multidimensional aim, two complementary analytic approaches have been selected. Both these approaches are social in orientation, and therefore, align with the Vygotskian orientation of this study, that is, the view of human development as socially mediated. The first analytic approach, systemic functional linguistics, makes possible a rich and detailed social semiotic analysis of meaning relations, including redundancy relations, and their function in the context of the Montessori objects in use. It also makes possible an exploration of the material and linguistic representations of abstract educational meanings. The second analytic approach, the pedagogic device (Bernstein 1986, 1990), provides a means for investigating, and evaluating, the design of the Montessori objects in terms of the way they re-present educational knowledge so children can interact with it freely and independently in order to make it their own.

1.3.2 Social semiotics as a central component of the meta-analytic framework

Accounting for the meanings encoded by the Montessori materials in use requires an analytical approach which brings in meanings from across a range of modalities. A social semiotic approach has been selected as the central component of this study’s meta-analytic framework because, amongst other reasons, it has the potential to account for several different modes of meaning-making in a culture.

The social semiotic approach selected for the study has been developed by Michael Halliday, and others elaborating his original insights. Halliday (1985, pp. 3-4; emphasis in the original) employs an expansive definition of semiotics, the study of signs, considering it ‘as the study of sign systems - in other words, as the study of meaning in its most general sense’. Resonating with Vygotsky, Halliday (p. 4) identifies language as
‘the most important, the most comprehensive, the most all-embracing’ mode of meaning, yet one mode among ‘many other modes of meaning, in any culture, which are outside the realm of language.’ Indeed, Halliday (p. 4) defines a culture ‘as a set of semiotic systems, a set of systems of meaning, all of which interrelate’. From this standpoint, the signs which externalise the systems of meanings constituting a culture cannot be considered as separate entities, but as ‘networks of relationships’.

This study uses the theory of language as social semiotic which has emerged from Halliday’s work, systemic functional linguistics, to explore the meaning relationships encoded by the Montessori objects in use. The theory has its origins in the work of Montessori’s contemporaries, de Saussure, Bühler, Malinowski, Hjelmslev, Firth and Whorf, all of whom were keenly interested in problems of meaning. A cornerstone of the theory has been systemic functional grammar, initially developed by Halliday (1978, 1985, 1994, 2002, 2004a), and elaborated in, for example, Halliday and Hasan (1976; 1985), Martin (1992) and Matthiessen (1996).

Systemic functional grammar provides a multidimensional description of how the grammar of a language ‘creates and expresses meaning’ (Halliday 2004a, p. 19). The description can be used as a map to locate each aspect of grammatical meaning-making in relation to other elements on the same dimension and in relation to the language system as a whole. The dimensions on which grammar is located include instantiation, realisation and metafunction (Halliday 2004a, pp. 19-33).

*Instantiation* is represented as a cline. At the most abstract end of this cline lie systems of choice, the paradigmatic patterns which constitute the meaning-making potential of the language system in the context of the culture. Moving along the cline, the potential is constrained by sets of variables, or *registers*, determined by particular types of situations of use. Registers predict particular *types of texts*. Text types are instantiated as specific instances of *text* at the ‘concrete’ end of the cline.

Texts are units of meaning related to grammar through *realisation*; texts are realised as grammar expressed as sound or writing. Realisation is a feature which is derived from conceiving language as a stratified system. In this conception, grammar, or wording, is
the stratum located between meaning and its expression as sound or writing. As the intermediate stratum between meaning and its expression, grammar organises meaning so it can be expressed as sound or writing.

The *metafunctions* of the language, the overarching purposes language achieves in context, shape systems of grammatical choice. Each grammatical choice is configured as a constituent in a structural chain, or syntagmatic pattern, on the basis of its rank on a hierarchical scale. In systemic functional grammar a constituent of grammar has two levels of labelling. Each constituent is labelled in terms of its *form*, or general class, as well as in terms of its *function* in specific contexts of use.

Systemic functional grammar has been used to study a wide variety of meaning-making contexts. Two such contexts are of particular relevance to this study. The first is the ontogenesis of language. Systemic functional studies have described the stages through which a child develops language, from prelanguage via protolanguage and its transition to the language system used by adults in the child’s culture (Halliday 1975; Painter 1984, 1990; Oldenburg, now Torr, 1990), as well as the ways children expand their meaning potential through the preschool years (Cloran 1999; Hasan 1996b; Hasan and Cloran 1990; Painter 1999a, 1999b; Williams 2001) and the school years (for example, Butt 1989, 2004; Christie 1990, 1999; Christie and Martin 1997; Christie and Misson 1998; Derewianka 1990; Gibbons 2002; Hasan 1996a; Hasan and Martin 1989; Hasan and Williams 1996; Lemke 1990; Martin 1985, 1993, 1999; Martin and Veel 1998; Rothery 1996; Schleppegrell 2004; Unsworth 2001; Williams 1998, 1999a, 1999b, 2004, 2005; Wells 1999). The systemic functional model has also been used to study the meanings made by semiotic modes other than language, including visual images (Kress and van Leeuwen 1996), displayed art (O’Toole 1994), movement (Martineec 1998, 2001), colour (Kress and van Leeuwen 2002), mathematics (O’Halloran 1998), museum texts (Ravelli 2006) and space (Stenglin 2004). Chapter 5 elaborates the social semiotic model of language in terms of its relevance to the analysis of Montessori objects in use.
1.3.3 Recontextualising educational knowledge in pedagogic discourse

Montessori (1982 [1949], p. 149) summarised her educational method as ‘the taking in of culture by means of spontaneous activity’. In a Montessori classroom the way into the cultural environment is offered to the child in the form of objects, materialising cultural meanings, combined with an exact language for expressing these meanings. The objects do not exactly replicate elements of culture, but, in the words of Montessori (1964 [1909/1912], p. 239), constitute ‘a species of magic key, opening the external world’ of culture to make it accessible to the child’s consciousness.

A means for elaborating this aspect of Montessori’s legacy is the concept of the pedagogic device, described by Bernstein (1996, p. 52; cited in Christie 1999, p. 156) as ‘a symbolic regulator of consciousness’ and ‘a condition for the production, reproduction and transformation of culture.’ With the pedagogic device, Bernstein provides a general model for considering how knowledge is recontextualised from the fields of its production in the wider culture outside the school to its reproduction in the school by means of pedagogic discourse, the discourse that constructs the relationship between teachers and learners. In pedagogic discourse, educational knowledge, the instructional aspect, is always embedded in the social order, the regulative aspect. The question which follows, as articulated by Williams (1999a, p. 111), is: ‘in what form should this knowledge be reproduced in pedagogic discourse?’ Montessori’s materialised pedagogy provides an interesting perspective on this question by suggesting some principled ways in which the structural requirement for recontextualisation might be addressed.

Having suggested the meta-analytic relevance of Bernstein’s proposals to this study, it is important to note, however, that the study does not attempt to address a further question raised by the interface between Montessori’s and Bernstein’s work, the issue of learners’ differential access to privileged and privileging educational knowledge as a function of their social positioning. The reported achievements of the children in Montessori’s first schools in the slums of Rome, in the first decade of the twentieth century, and subsequent reported achievements of Montessori students from a range of social and cultural contexts, invite a detailed exploration of this complex issue, but its scope clearly makes it an issue for another study.
1.4 Pedagogic objects: Re-theorizing Montessori’s proposals

1.4.1 Meaning relations by design

Using the meta-analytical framework introduced in the previous section, this study explores the significance of the meanings encoded in the design of Montessori’s pedagogic objects. Design features such as shape, colour and size are not selected merely to make the Montessori materials decorative and entertaining, in line with adult beliefs about what appeals to young children. Neither are they selected for their role in localised practice in early childhood classrooms. Instead the features are selected in order to capture meanings with wider cultural and educational significance.

Relations between design features such as shape, colour and size clearly carried an important signifying potential for Montessori as she designed the pedagogic objects. This becomes particularly apparent when materials designed according to Montessori principles are compared with classroom resources commonly available through educational retailers. This point is discussed as part of a general overview of Montessori materials and their characteristics in Chapter 6. The significance of relations encoded in design features such as shape, colour and size, is particularly evident in the objects Montessori designed to teach grammar.

1.4.2 Pedagogic objects for learning grammar

Through observing children’s interaction with objects representing cultural meanings, Montessori (1982 [1949], p. 149) came to believe that children could ‘acquire culture at a much earlier age than is generally supposed’, but not in the generally accepted ways. She continues:

... [the child’s] way of taking in knowledge is by certain kinds of activity which involve movement. Only by action can the child learn at this age.

Montessori applied this principle to all areas of the school curriculum, including the teaching of grammar. She justifies her approach in the following way:

Yes, we shall teach him grammar from the first! And truly, it sounds absurd, in today’s way of thinking, that we should start our first direct teaching of language with grammar,
and that the child can begin learning this *before* he begins to read and write. But let us think more carefully. What is the basis of meaningful speech? Is it not grammar? Whenever we (and the children) talk, we talk grammatically. If, then, we give him some grammatical help when he is four years old, while he is perfecting his language mechanisms and enriching his vocabulary, we provide conditions favourable to his work. By teaching grammar, we help him to master perfectly the spoken language that he is absorbing. Experience has shown us that little children take the liveliest interest in grammar, and that this is the right time to put them in touch with it. In the first period (from 0 to 3) the acquisition of grammatical form was unconscious; now it can be perfected consciously (Montessori 1949, p. 150; emphasis in the original).

Chapter 7 provides a detailed description and analysis of the materials Montessori designed to teach grammar to young children. The analysis is undertaken using resources drawn from systemic functional grammar and related descriptive resources used to analyse semiotic modes other than language. The Montessori materials for teaching grammar are of special interest because Montessori’s relational approach to meaning-making, as evidenced by the design of the Montessori objects, is particularly visible. The materials are also interesting because they are still being used in Montessori schools today, at a time when the teaching of grammar has become a controversial and widely misunderstood aspect of contemporary literacy education.

Montessori first began designing grammar materials for young children at the beginning of the twentieth century. By that time the historic link between grammar teaching and the teaching of rhetoric and logic had been weakened, thus making the link between grammar and meaning-making much less visible. The teaching of grammar was reduced to little more than a narrow concern with correctness rather than with the effective and skilful use of language (See for example, Christie 1990, Williams 2005). By the 1960s, in English-speaking countries at least, impoverished school grammars had been largely discarded. Attempts at reintroducing grammar since then have had mixed success wherever teachers continue to perceive the study of grammar as separate from learning how to use language in a meaningful way.

Montessori’s inclusion of grammar in her pedagogy is unusual, even today, because of the young age of the children who learn it and the energetic games through which it is learned. Even more significant, however, is the key role grammar activities play in the Montessori reading pedagogy, demonstrating Montessori’s recognition of the role of
grammar in meaning-making. Chapter 7 reviews Montessori’s use of grammar to support literacy development and examines the design of the Montessori grammar materials and activities.

1.4.3 Educational knowledge designed into objects

Maria Montessori’s legacy is a materialised pedagogy, still in use across the world nearly a century after it first appeared, in which educational knowledge is presented to children in multimodal form. While the pedagogy has been handed on to succeeding generations of Montessori teachers, with great attention to detail and accuracy, the theoretical underpinnings of the pedagogy have never been so precisely elaborated. Both advocacy and criticism of the Montessori approach are characterised by a lack of attention to the detail of Montessori’s writing, and, more especially, to the detail of the pedagogical materials themselves. Chapter 2 reviews some of the challenges posed to the researcher by the Montessori literature, both primary and secondary.

Framing this study is a view of learning as a semiotic process. This view follows Halliday (1993b, p. 113; emphasis in original) who describes the semiotic process of learning as ‘learning to mean, and to expand one’s meaning potential’. From this standpoint, Halliday proposes a theory of learning comprising ‘two unifying principles’ or continuities. These are a ‘developmental continuity right through from birth to adult life’ and ‘a structural continuity running through all components and processes of learning’.

The hypothesis underlying the study is that Maria Montessori’s material legacy exemplifies both types of theoretical continuity proposed by Halliday. With these continuities in mind, the task of this study is to investigate whether a social semiotic analysis of representative elements of the Montessori materialised pedagogy might provide the basis for a re-theorisation of the Montessori view of learning. This task involves a semiotic analysis of the multiple modes of meaning incorporated into the design of the materials themselves and of the meaning-making activity which constitutes their use. The steps towards completing this task are outlined in the following section.
1.5 Thesis overview

The following chapter reviews the Montessori literature, both primary and secondary, and identifies some of the challenges and limitations this literature represents. The chapter also describes the traditions which surround the transmission of the Montessori legacy.

Chapter 3 traces the sources of Montessori’s approach to ideas which emerged in the eighteenth century. It also presents an introductory reading of her major theoretical proposals, including an introduction to both her conception of human development and her pedagogical principles, especially in terms of their realisation as pedagogical practice. This review suggests that Montessori achieved a greater level of theoretical sophistication than is commonly thought, but that a refinement of her theoretical ideas, and a proper appreciation of the implications of her educational practice, can be articulated through a re-analysis based on social semiotic theory.

Chapter 4 explores some of the commonalities between Montessori’s and Vygotsky’s theories, particularly with reference to semiotic mediation. This exploration highlights the lack of an appropriate unit of analysis in both theories for modelling semiotic mediation. This problem has previously been addressed by major proposals from Wertsch (1985, 1990) and Hasan (1996a, 2005 [1992], 2005 [1995], 2005c). Hasan’s proposal has been selected as most fruitful for this study. This proposal is elaborated in Chapter 5 to distinguish between two sub-units of analysis that contribute to ‘text’ in Hasan’s terms. These are the sub-unit of mediating learning materials and that of teacher-initiated discourse about those materials. To understand the significance of Montessori’s pedagogical proposals, it is necessary to describe relations between the two sub-units carefully, and to consider both the internal and external relations into which both enter.

Chapter 5 introduces the specific elements of systemic functional theory and the pedagogic device needed for this research. The systemic functional framework enables a description and analysis of the design principles realised in Montessori’s objects and their use, and an evaluation of their significance, while the pedagogic device is a means for examining how these principles recontextualise educational knowledge as pedagogic discourse. A comparison of the Montessori model of development with Vygotsky’s and
Halliday’s proposals, as well as an overview of some key general features of the Montessori materials, are considered in Chapter 6. Specific features of the Montessori grammar pedagogy are examined in detail in Chapter 7. Examining the meaning relations encoded in Montessori objects requires the analytic power of the grammar of semiosis (Matthiessen 1991), that is, Halliday’s modelling of relational grammar, the complex grammar of relations between elements, the grammar of *is*.

Finally, Chapter 8 reviews the significance of these arguments for re-theorising Montessori’s ideas. It will suggest some implications for education, both within Montessori schools and in school education more generally.