

Meaning and medium in young children's picture-making

Mona Sakr (2013)

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**Meaning and Medium in
Young Children's Picture-Making**

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October 2013

Abstract

Picture-making has a special role in early childhood. It is an activity that bridges the young child's sensory exploration of the world around them and their later engagement with graphic symbolic practices. Psychological and sociological studies have focused on young children's pictures as both subjects of and tools in research. Yet these studies have conceptualized picture-making almost exclusively as a practice that occurs on paper using pencils, felt-tip pens or crayons as inscription devices. Despite the increasing presence of screen media in children's lives, very little research has explored the influence that the screen medium has on picture-making and any similarities and differences that exist between picture-making on paper and on screen. Furthermore, almost no research has examined how key members in the 'interpretive community' (Fish, 1980) of early years education conceptualize and construct screen picture-making, or how children enact this activity in the naturalistic environment of the free-flowing early years classroom.

The present research addressed these issues using a social semiotic approach in designing and conducting three related studies on screen picture-making. In the first study, 36 children were observed as they made pictures either on paper or on screen. Through the resulting comparisons, various material and social affordances of screen picture-making were identified as having an influence on the processes and products of picture-making. In order to determine whether these affordances were equally applicable in everyday contexts, an observational study of screen picture-making in the early years classroom was conducted. The findings from that study provided further evidence of the importance of the affordances identified in the previous study, but also demonstrated the extent to which social interactions shape how the activity of screen picture-making is enacted. To explore

this further, six practitioners were interviewed about their attitudes towards screen picture-making and the learning it entails. Their responses revealed the relationships between their perceptions of the activity and the way it was implemented and constructed in the classrooms where they work.

Collectively, the findings from these studies demonstrate the importance of considering both the material and social aspects of the affordances of the screen medium and how these influence the expression of meaning through picture-making. Four key material properties of screen picture-making were seen to influence how children made pictures: abundance, rapidity, referential rule-breaking, and mouse manipulation. These properties need to be taken into account when determining the opportunities for early years learning presented by screen picture-making. Moreover, the research findings highlight the extent to which the construction of screen picture-making is the work of an 'interpretive community' surrounding each child. Thus, screen picture-making in the early years is best thought of as a social project, which unfolds according to the decisions made by those in the classroom. Through understanding the activity in this way, practitioners and children are empowered to discuss and decide how screen picture-making should be integrated into the early years classroom and what new opportunities it should offer in the expression and construction of meaning.

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Chapter 1

Introduction

1.1 Introduction

The focus of this thesis is how meaning is made in young children's pictures and the role that the medium of picture-making plays in this process. Specifically, it explores young children's picture-making practices when they are enacted via the screen medium as opposed to on paper. In this opening chapter, I will explain the experiences and interests underlying this focus: Why text-making? Why young children's picture-making? Why the influence of medium? Why the screen medium in particular? I will then position the thesis in terms of discipline and field and outline its original contributions to theory and practice. Finally, I will sketch the thesis structure.

1.2 The textual self

In the Montessori nursery attended by my niece, painting is considered to be an important daily activity. There are no age limits on this activity and even the youngest infants are encouraged to participate. At the age of only six months, while tolerating the agony of her first teeth and engaging in the first attempts to crawl, my niece was helped by the nursery practitioners to place her hands in colourful paint and transfer them to a blank paper surface. For the first two weeks of her participation in this activity, she didn't engage with its second half. Despite the coaxing behaviours of the practitioners around her, she refused to commit any marks to the paper in front of her. Instead, she held the paint tightly in her hands, keeping her fists firmly clenched. The practitioners described these incidences in detail to her parents, partly to explain the colour of her fingernails, but also as a contribution to the dialogue that surrounded the early development of her abilities and

individuality. What did it mean that she refused to let go of the paint and why was it so important that she did?

From the earliest experiences of a child in the preschool setting, the textual self – the expression and construction of the self through text-making – emerges as a central theme in education. Every child is encouraged to make texts that configure meaning through the use of signs. These texts include role play, music, dramatic performance and drawing. Great value is placed upon these texts as records of and testaments to the ‘self’ (Lemke, 2000, 2002; Hawkins, 2002). By holding onto the paint, my niece was refusing to share, construct and negotiate her ‘self’ through text-making. Who was she if there were no texts to her name? The textual self is central in dominant philosophies of education prioritising the liberation or creation of the individual. Furthermore, texts are central in how we think about ourselves as human beings. As Chandler (2007) describes, ‘we seem as a species to be driven by a desire to make meanings’ (p. 17). These meanings rely on the creation and interpretation of signs, and these are in turn configured to make texts. This thesis therefore began with the recognition of text-making as fundamental in understanding the ‘self’ and the organisation of educational experiences.

1.3 Young children’s picture-making

When I began this research, my intention was to look at the textual self among various age groups, not just young children. While my pilot study focused on 4-5 year olds’ pictures, I planned to conduct research that looked at texts created by older children and adults also. In working with young children however, I was struck by the creativity and constraint that simultaneously characterised their picture-making practices, regardless of the medium used. I was amazed by the

originality of some children in constructing visual representations that challenged the 'grammar of visual design' (Kress & van Leeuwen, 1996) as I had come to understand it, and the contrasting preoccupation of other children with what was expected of them and whether they were achieving a 'good' picture. The apparent polarity of my early observations could be understood, I realised, through a social semiotic approach to meaning whereby the children I observed were both agents in semiotic design, making choices and developing personal style, and simultaneously players in a social game where there were interpretive codes and expectations to meet. Children's pictures tell us something about the individual since they often relate to internal conflicts and interests (Diem-Wille, 2001) while also relating to the wider context and community in which they are made (Frisch, 2006; Anning, 2003; Rose et al., 2006). This is true of all text-making, but I found the tension between these two facets of text-making to be thrown into sharp relief in young children's picture-making. The interplay is more visible in their practices as a result of their candid talk and the diversity of the texts they produce. Therefore, I decided to focus on young children's picture-making as I believed that this context would facilitate my understanding of both the personal and social factors in text-making and how these are interwoven.

1.4 Meaning and medium

In looking at how young children make meaning through their pictures, I have focused on the role of the textual medium in this process. While Saussurean semiotics prioritises the immateriality of the signified over the materiality of the signifier, poststructuralist thinkers such as Voloshoniv (1973) and Derrida (1976) have emphasised the importance of the material nature of texts. Within this approach, the textual choices that we make about medium are central; the choice to communicate a

meaning through one medium rather than another is significant. It is not just what we are trying to convey, but how we choose to convey it that matters in the construction of our textual self. At this point, I could invoke Marshall McLuhan's hackneyed aphorism 'the medium is the message' or repeat Eco's (1976) elegant description of the medium as 'charged with cultural signification' (p. 267). Either way, I am echoing an established concern among semioticians with the text-making medium and the part it plays in the construction of medium.

In order to consider further the importance of medium, take the following example. You wish to tell another person that you love them. There are various choices that need to be made. What mode will you use to communicate your love? You could use language to say or write the words 'I love you'; you could attempt to convey your love through an image or a piece of music; perhaps you'd use a particular gesture or movement; quite possibly, you would combine these choices in a multimodal performance of love. Let's say you decide to write the words. Where will you write them; what medium will you use? Perhaps you will write the words with a ballpoint pen onto the back of a postcard; perhaps you will make the words by moving your finger through a mound of sugar on a café table; perhaps you will spray paint the words onto a wall; perhaps you will carve the words onto a school desk; perhaps you will choose any one of these options, take a photograph of the result and then share this via *Facebook*. The choice you make matters. The meaning that is created will change: 'I love you' on a post-it note means something different to 'I love you' written with lipstick onto a bathroom mirror.

How does medium change meaning? Firstly, medium changes meaning in the way described above – as a choice in the process of semiotic design. But even once the choice of what medium to use has been made, a medium continues to shape the way meaning is created. It

does this through its material properties and its social associations. Collectively, I call these affordances, a term first used by James Gibson in the 1970s to refer to our perceptions of potential action in the physical environment around us. The term has since been adopted by technology researchers and designers to refer to the way artefacts shape our behaviours and outputs through what they materially allow and what they culturally suggest. The term is not without problems (as I will discuss in Chapter 2) and yet, it offers us a productive way to think about the constant dialogue between meaning and medium, and the role of both the material and the social in this relationship.

When I write 'I love you' on a post-it note, I am working within material constraints that influence other semiotic choices I make. Because the post-it note is a limited physical space, my writing will need to be small. I might be aware that the size of my writing makes the statement look too timid or inconsequential. Perhaps I will decide to compensate for this (and shift meaning) by ending the statement with an exclamation mark. Such material considerations accompany a barrage of social associations that influence my behaviour. For example, I most often see post-it notes used for rushed everyday reminders in the workplace and for humorous comments between colleagues. With such associations in mind, I am more likely to write sloppily and even to abbreviate: 'I love you' becomes 'I (heart) u!' and the semiotic potential of the act is rather different. By considering this example, I wish to demonstrate the extent to which the medium is an active player in any act of meaning-making; to use Latour's (1987) term, the medium is an 'actant'.

1.5 The screen medium

In exploring medium, I decided to focus on picture-making via the screen medium because of the increasing prevalence of the latter in our

everyday lives. Increasingly, we consume and produce texts that are on screen. A recent report conducted in Canada and published in 2012 found that those born between 1982 and 1995 spend more than 50 hours per week interacting with screen-based media¹. According to contemporary Google statistics, 90% of all media interactions that occur do so via a screen². The consumption of screen books is significant and growing; Amazon's sales of eBooks increased by 70% last year, while their sales of paper books increased by only 5%³.

Despite attempts to 'protect' children from an excess of screen time (e.g. see guidelines from the American Academy of Paediatrics⁴), they are not exempt from increasing use of the screen medium. An abundance of e-books, websites and apps cater to children in the earliest years of their life. A report published in 2011 on American children's digital media use found that half of the 0-8 year olds surveyed had access to a mobile screen device like a smartphone or tablet.⁵ The same study found that 29% of parents had downloaded an app for their child to use. More than half of 2-4 year olds had used a computer, and this grew to 90% among 5-8 year olds. Amidst this abundance, there is the opportunity for children to make pictures on screen using child-friendly software. The appeal is clear: screen picture-making involves no mess, relies on materials that won't run out, and requires minimal amounts of physical space. The activity remains however, an unknown quantity. Screen picture-making has no explicit role in the early years

¹ <http://www.cmf-fmc.ca/documents/files/about/publications/Second->

² <http://www.google.com/think/research-studies/the-new-multi-screen-world-study.html> Accessed online 30.08.2013

³ <http://www.businessweek.com/articles/2013-01-31/as-e-book-sales-rise-apple-ipad-bests-amazon-kindle> Accessed online 30.08.2013

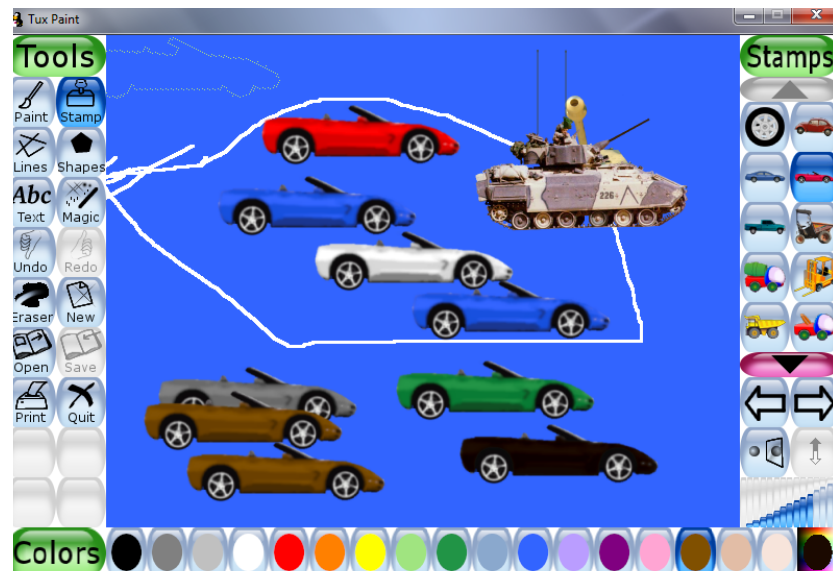
⁴ <http://www.aap.org/en-us/Pages/Default.aspx> Accessed online 30.08.2013

⁵ <http://www.common sense media.org/sites/default/files/research/zerotoeighfinal2011.pdf> Accessed online 30.08.2013

curriculum, and very little research has been conducted into its presence in informal and formal educational spaces.

When I talk about the 'screen medium' or 'screen picture-making', I am actually referring to a wide range of variables. In the case of a four year old child making a picture on screen using the child-friendly picture-making software *tuxpaint* (figure 1.1), the display device (laptop screen/whiteboard screen), input device (mouse/fingertip) and software (*tuxpaint*) are all 'actants' (Latour, 1987) in the process. These aspects of medium (alternatively conceptualised as semiotic resources; see Chapter 2) will influence the content of my picture, its composition and the way I conceive of the activity. To understand such influences, I need to discern the part that these various 'actants' play by identifying how their affordances influence the construction of meaning. Thus, while I use the term 'screen' for the sake of brevity, there are multiple material components involved in the interactions that are the subject of this thesis. In this research, I decided to use the software *tuxpaint* for both practical and theoretical reasons. Practically, it is readily accessible and freely downloadable, so practitioners would be able to have the software after being exposed to it through my research if they so wished. In addition, the features of *tuxpaint* map onto the theoretical interests I have in the material affordances of the screen medium. The software comprises a combination of tools that mimic those available when using paper (e.g. the 'paintbrush' tool) while simultaneously offering the potential for 'digital remix' (Lankshear & Knobel, 2006; Knobel & Lankshear, 2008) through the presence of ready-made images that can be stamped onto the screen.

Figure 1.1 *tuxpaint* screenshot



1.6 Original contributions to knowledge

My research is interdisciplinary in nature, drawing as it does on a wide range of concepts and literature from various disciplines including semiotics, philosophy, psychology, sociology and anthropology. The primary concern is with children's semiotic practices, but I am interested in these practices because of the part that they play in the construction of the 'self' and as manifestations of culture and the social order. The latter concepts speak to the disciplines of psychology, anthropology and sociology, and these traditions of thought have all contributed to the theoretical frameworks drawn on in this research. As well as these disciplinary influences, the thesis is positioned in the field of education; in particular, the conclusions relate to the context of early learning.

At its simplest, the thesis provides a 'map' of children's screen picture-making, its affordances and its semiotic potential. Over the last twenty years, as the social semiotic perspective has grown in influence, various media and modes have been mapped, enabling insights into the types of semiotic labour that different material resources contribute

towards (Jewitt, 2009). My research carries on this tradition by looking at a particular semiotic practice that hasn't previously been focused on in a sustained way. However, the theoretical contribution extends beyond this kind of fine-grained analysis because the process of mapping a semiotic activity inevitably probes and pushes against other more established practices of meaning-making. In asking questions about screen picture-making, I have had to ask bigger questions: What is a picture? What do children think a picture is? How should we think about children's pictures, particularly when they include no discernible representations? What does 'self-expression' mean and is it a useful way to think about children's pictures? What role does picture-making play in the social dynamics of the classroom and how do these dynamics unfold in children's semiotic practices? How are tensions between perceptions of screen picture-making negotiated and resolved between children? What role do practitioners have in shaping the use of technology in the classroom?

Beyond a theoretical contribution, the thesis has practical implications for early years education. Firstly, it suggests tools through which practitioners can discuss and reflect on the integration of digital environments into the early years classroom. Secondly, it challenges the interpretive codes (Fish, 1980) of the early years community that are applied to children's picture-making, regardless of the medium used. Previous research suggests that practitioners lack confidence in the context of art education (Welch, 1995; Holt, 1997). Through this thesis, I want to grapple with the dominant ideology that I believe to be partially responsible for this impact on practice – an ideology that constructs children's pictures as necessarily beautiful and children's picture-making as a practice that always strives towards clearly discernible representations of the world surrounding the child. When children engage with the process of picture-making, they are often not working towards beautiful products that reference recognisable aspects

of the world around them; by only seeing their pictures in these terms, the other forms of meaning that they build through pictures are neglected and remain unsupported. This tension is particularly apparent in the context of young children's screen picture-making because the screen is a relatively new medium in the early years classroom and the expectations that surround its use are less established and more diverse.

1.7 Thesis structure

In Chapter 2 of this thesis, I provide an overview of the theoretical framework I am adopting and the major theoretical cornerstones that underpin my approach. In Chapter 3, I review the existing literature on picture-making and the influence that screen media has had on children's meaning-making practices. I do this within the theoretical framework outlined in Chapter 2. Together, these chapters form the basis of the four research questions that guided my research, so these are introduced at the end of Chapter 3. In Chapter 4, I sketch my methodology and detail the methods of data collection and analysis that I have employed. In Chapters 5, 6 and 7, my analytical focus is on a comparison of young children's paper picture-making with their screen picture-making. These chapters use talk and texts produced by 36 children as they made pictures on paper and on screen. In turn, the chapters compare the content, composition and narrative of children's picture-making on paper and on screen; using examples, each chapter explores the material and social affordances that are particularly relevant in understanding the medium-related differences. In Chapter 8, I explore the findings of an observation study looking at screen picture-making in the context of the everyday early years classroom. In Chapter 9, I take a closer look at the way practitioners conceptualise screen picture-making and the opportunities it provides for learning by

analysing data collected through semi-structured interviews. While different chapters relate to different research questions, they all contribute to my central aims of understanding how children's picture-making is enacted via the screen medium, and how this is constructed by, and in turn constructs, the 'interpretive community' (Fish, 1980) of early years education. The integration of these different aspects is clearest in Chapter 10 of the thesis, which presents the theoretical and practical conclusions of my research.

1.8 Summary

In this introduction, I have presented the foundations of my thesis. The first of these foundations is the centrality of texts and text-making in investigations of the 'self' and education. The second foundation builds on the first by positing that the medium used to make a text constitutes a vital semiotic choice and one that plays a part in the creation of meaning. Once this semiotic choice has been made, a medium continues to have an influential role in the construction of meaning and this influence can be conceptualised through the notion of affordances, which are the medium's material properties and the manner in which it is socially constructed. The screen medium is of particular interest as a result of its increasing prevalence in the life of the young child. The focus that emerges from these foundations is young children's screen picture-making and the repercussions of these practices for the 'self' and early education. This focus is in dialogue with concepts from various disciplines including semiotics, philosophy, psychology, anthropology and sociology, and of course the field of education. By mapping children's screen picture-making in comparison to their paper picture-making, and by investigating the practices of screen picture-making in the wider educational context, I will contribute to theoretical

discussions about meaning and medium and further practical discussions about picture-making in early years education.

Chapter 2

Theoretical Framework

2.1 Introduction

In the previous chapter, I mentioned some of the key concepts underpinning this research. In this chapter, I want to provide a more systematic overview of my theoretical framework, which has been central to all aspects of my thesis. It is through this framework that I have been able to engage productively with the varied literature that relates to children's screen picture-making (Chapter 3); to establish an appropriate methodology for the research (Chapter 4); and to understand my findings and their implications in the fullest possible way (Chapters 5 – 10). The research presented in this thesis has been in constant dialogue with the theoretical notions I will present in this chapter.

Most theories of children's picture-making have developed in the discipline of psychology or in the field of education. Models of symbolic development offered by psychology have tended to focus on the mental capacities of the individual and ignore the extent to which sign use is influenced by the social context and the materials used in the process. As Gardner (1982, p. 115) notes:

Developmental psychologists have yet to devise an adequate means of characterizing all symbolization – one doing justice to the wealth of influences and factors reflected in each symbolic product.

On the other hand, educational research has focused on the way that young children's picture-making is supported by adults in both home and school contexts, but it has steered away from theorizing the influence that the materialities of sign-making, and in particular the medium, have on children's pictures (Frisch, 2006). In order to extend

research in this area, an alternative framework from another discipline is required. Social semiotic theories combine an interest in individual acts of meaning-making, the social construction of meaning-making and the interplay between medium and meaning. In this chapter, I start by providing an overview of signs and meaning as they are understood in a Saussurean approach to semiotics and then as they are understood in social semiotics. I also consider the theory of embodied interaction as a way of exploring further the material properties of the medium and the notions of ‘interpretive community’ and discourse as ways of talking about the social construction of the medium.

2.2 Signs

In Saussurean semiotics, signs comprise two parts: the signified and the signifier. The signified is the concept to which we are referring through the signifier. When I say ‘water’, the word acts as the signifier and the idea of water to which I am referring is the signified. In this conceptualization, making meaning depends on the formation of a relationship between something that is internal to an individual and something that is external and can be communicated between individuals. In the case of young children’s picture-making, this would mean that children communicate inner ideas via their graphic products, which can be interpreted by others. Both structuralist and poststructuralist thinkers have suggested the existence of more complex dimensions in this relationship. For example, in Barthes’ (1977) distinction between connotation and denotation, images can both denote particular things in the world and at the same time connote meanings that are culturally shared. A child’s picture of a house for example can both refer to the object of a house (denotation), but it can also induce culturally embedded ideas, for example the notion of home (connotation).

While Saussurean semiotics suggests that the signifier serves the signified because the former refers to the latter, acts of meaning-making may be more than simply referential. In Jakobson's (1960) understanding of language, the referential function, whereby content in the everyday world is referred to through the use of language, is accompanied by other functions. One such function would be the emotive function, whereby the maker expresses an affective layer of meaning. Depending on the context, particular functions may dominate over one another. In certain circumstances, the user or maker of a sign may be more focused on emotional expression rather than referring to something in particular. The complexity arising from such approaches was noted by Jakobson in 1973:

When one-sided concentration on the cognitive, referential function of language gave way to an examination of its other, likewise primordial, underivable functions, the problems of the code-message relationship showed much greater subtlety and multivalence (p. 21).

The notion of the 'floating signifier' (Levi-Strauss, 1950/1987) builds on the possibility of other 'primordial, underivable functions' (Jakobson, 1973, p. 21) by highlighting the possibility that signifiers, whether they be words or graphic inscriptions or gestures, can be used without attachment to a particular signified; they might be used for pleasure and in play without a referential function present at all (Derrida, 1976; Derrida, 1980).

I am applying these ideas to young children's picture-making by thinking about meaning in children's pictures in terms of four dimensions. In addition to referencing content (the referential dimension; whether discernible or indiscernible to the viewer), children may be focused on the aesthetic dimension (similar to Jakobson's 'poetic function'), the experimental dimension (similar to Jakobson's 'metalingual function'), or the social dimension (similar to Jakobson's

'conative function') of making meaning. What I am calling the 'aesthetic dimension' relates to children's interest in 'compositions to delight the eye' (Kolbe, 2005, p. 32). More generally, the aesthetic dimension can be understood as the care that is paid to the choice of particular signifiers over others, in order for the relationship between signifiers to be visually pleasing according to the maker:

A slim thread or aspiration to quality that makes us choose one word over another, the same for a colour or shade, a certain piece of music, a mathematical formula or the taste of a food (Vecchi, 2010, p. 5).

The referential and aesthetic dimensions of picture-making both suggest a focus on the products of picture-making, but children may be equally interested in the processes of the activity. Through the experimental function of picture-making, children engage with the constraints and opportunities offered by the materials they are using, determining what it is possible for them to do with the medium available. Finally, the social dimension is important when we consider acts of meaning-making that take place in an intensively social context, like the classroom. All meaning is made in an essentially social way, since it positions a 'self' that makes the sign and an 'other' to interpret it (Bakhtin, 1981), but in some contexts, this dimension comes to the foreground.

2.3 Social Semiotics

In Saussurean semiotics, the signified is prioritized over the signifier; the signifier is conceptualized as being at the service of what it refers to (Derrida, 1976). But through the ideas outlined above (denotation and connotation, Jakobson's functions, the 'floating signifier'), the focus is placed on the material and social nature of the sign (Chandler, 2007). In

a framework that stresses these aspects, the medium of a text becomes essential in the study of meaning-making. The field of social semiotics has developed in order to pay more attention to the materiality of the sign and the social context in which signs are used (Hodge & Kress, 1988; van Leeuwen, 2005). Because of these priorities, social semiotics presents a solid framework within which to consider the role that the medium plays in the construction of meaning as it is enacted in young children's picture-making.

In social semiotics, meaning is made through semiotic resources. These resources can be conceptualised as 'actions and artefacts we use to communicate' (van Leeuwen, 2005, p. 3). Screen picture-making represents a different set of semiotic resources to those available when children make pictures on paper. In order to explore a set of resources further, it is necessary to look at both the 'theoretical semiotic potential' and the 'actual semiotic potential' (van Leeuwen, 2005, p. 4) that these resources possess. For the former, the interest lies in what it is possible to do with the resource given its material properties, whereas the 'actual semiotic potential' refers to how this is realized in naturalistic contexts. Thus, there may be properties of the picture-making software that facilitate particular kinds of picture-making but that are not made use of. In the terms of Bjorkvall and Engblom (2010), an analysis of the theoretical semiotic potential of a medium needs to be accompanied by investigations that identify the semiotic potential that is realized, or 'semiotized', by everyday users in context.

An analysis of the semiotic potential of a set of semiotic resources can be supported by consulting inventories of these resources. Such inventories catalogue the way a particular resource 'has been, is, and can be used for purposes of communication' (van Leeuwen, 2005, p. 5). A systematic inventory is unavailable for screen picture-making, but the literature reviewed in the next chapter acts as a starting point for such

an inventory. For example, Labbo's (1996) innovative research on children's screen text-making suggests that an important part of the screen's semiotic potential lies in the opportunity for children to easily erase material that they place on the screen. This facilitates certain kinds of picture-making and inhibits others. The social context of my research however, is different to that of Labbo's, so I must remain open to the possibility that her findings, while indicative of 'theoretical semiotic potential', may not map onto the practices that I observe. Whether they do or not, social semiotic theory suggests that there will be contextual reasons for the way patterns of use develop. This viewpoint constitutes a suitable theoretical framework for this thesis because it focuses on the differences that may arise when an old activity is enacted through a new medium and suggests that the differences that occur can be traced back to both the material properties of the resources on offer and the way that these are socially constructed in a given context. This duality – the recognition of both the material and the social – will be an essential facet of my investigations into meaning and medium in children's picture-making and a recurring theme throughout the thesis.

2.4 Multimodality

Within a social semiotic approach, a particular field of inquiry has developed over the last 20 years: multimodality. Multimodality focuses on the plurality of modes with which we communicate, the qualities that distinguish these modes from one another, and how these modes are brought together in the 'multimodal ensemble' (Goodwin, 2000) of everyday communication. The central premise of multimodality is that meaning making occurs and can be systematically studied in various modes:

Meanings are made, distributed, received, interpreted and remade in interpretation through many representational and communicative modes – not just through language’ (Jewitt & Kress, 2003, p. 1)

Modes are organised sets of semiotic resources and practices. Typical modes that we use to communicate with others include writing, speech, image, gesture, gaze and so on. The concept of mode does not necessarily help us to think about the differences between children’s paper and screen picture-making. If we consider screen picture-making through the lens of ‘mode’, it foregrounds the same mode (image) as paper picture-making and fails to elucidate the differences that occur as a result of medium. If we use instead the more open notion of semiotic resources, then we can recognise that there are both similarities and differences in the resources available to children when they make pictures on paper and on screen and begin to explore these in more depth.

However, other concepts developed by theorists in multimodality have been central to this thesis. For example, multimodality suggests that cultures interact with modes differently and I would argue that this is also the case for semiotic resources. A culture can put more or less work into a particular set of semiotic resources. The more work that goes into a resource, the ‘more fully and finely articulated it will have become’ (Jewitt & Kress, 2003, p. 2). Thus, Western cultures have put a vast amount of work into the semiotic resources associated with language and writing, and these semiotic systems have been conventionalised and analysed to a great degree as a result. On the other hand, semiotic resources that are new to a culture will be less articulated in their use. As a set of resources becomes increasingly familiar and increasingly the subject of cultural investment, the patterns and expectations of use that surround it will narrow. This has relevance to my thesis since children’s screen picture-making represents a

relatively new set of semiotic resources, while paper picture-making is more established. Examples of the latter are therefore more likely to relate to 'fully and finely articulated' patterns of use while screen picture-making might exist as a more fluid enterprise.

Another principle of multimodality is that semiotic resources are distinguishable from one another on the basis that they have distinct affordances. Affordances are understood as suggestions of semiotic use. They may be material affordances residing in the medium – what it is physically possible to do with the medium – or social affordances that surround the use of those resources. For example, a set of coloured pencils and a blank piece of paper afford the creation of marks. Through social conventions that surround these resources, they also afford the act of drawing as opposed to writing, since the latter is not typically done with coloured pencils or on blank paper. It is physically possible to write using these resources but social conventions suggest that the appropriate use is drawing. We can also conceptualise these social affordances as the discourse that surrounds a set of semiotic resources: the conglomeration of talk, interaction and action that has surrounded the resources in the past.

Some theorists, particularly Oliver (2005), have criticised the use of affordances in conceptualising semiotic practices enacted via new technologies. Oliver suggests that the term, since its first use by Gibson in the 1970s, has been used to refer to an array of ideas, and through its re-workings, has lost its usefulness for researchers in the field of learning and technology. He argues that the term has been applied to physical properties of the environment or object; to a user's perceived clues for use; to cultural or learned practices; or to all three. This leads us to question whether affordances have an objective reality, or whether 'all we can work with is socialisation and learning' (p. 406). If the latter is true, why talk about affordances at all? Why not instead rely

on theoretical frameworks that embrace social and cultural practices, such as discourse analysis or activity theory? Oliver's argument is thought-provoking and raises some difficult issues in pursuing research that rests on the concept of affordances. However, by limiting ourselves to 'socialisation and learning', we are forcing ourselves to focus only on social affordances and to ignore the materiality of the semiotic resources on offer. In the work of Bjorkvall and Engblom (2010), both material and social affordances are crucial in understanding children's meaning-making on the computer. They argue that the former are 'semiotized' through patterns of use, but they continue to guide how the resources are used. In line with this approach, I argue that the duality of affordances, existing materially and socially, makes them a useful starting point from which to explore the relationship between meaning and medium.

2.5 Embodied interaction

At their most basic, material affordances refer to what it is physically possible and impossible to do within a particular medium. For example, in the context of screen picture-making, it is possible to include ready-made images and it is possible to rotate and change the size of these images. On the other hand, it is not possible to add photographs that you have taken yourself – you are limited to using the images that are available already within the software. Research into creative practices on screen has drawn attention to certain material affordances. For example, there has been a focus on the inclusion of ready-made images in software like *tuxpaint*. Depending on perspective, this has been discussed in various ways. While some have suggested that it enables 'digital remix' (Lankshear & Knobel, 2006; Knobel & Lankshear, 2008), more traditional approaches to early years education (e.g. Read, 1957) would suggest that such images limit the creative output of young

children. In addition to ready-made images, other material affordances that have been focused on include the ease with which digital material can be covered over and added to, and the perceived hindrance of mouse manipulation, which is the typical input device when a desktop or laptop computer is being used. In relation to children, the mouse has garnered diverse commentary. While some have questioned its suitability for use by young children, and have promoted instead the 'intuitive' nature of tangible interfaces, where direct touch is the main form of control (Wyeth & Purchase, 2002; Couse & Chen, 2010), other researchers have suggested that even young children are adept at using the mouse and demonstrate a high level of control (Donker & Reitsma, 2007).

In reality however, the material possibilities of screen picture-making that have been identified may be more or less important when the practice is actually occurring in context. While some possibilities may be realized, others may not be 'semiotized' (Bjorkvall & Engblom, 2010) or used as the basis for meaning-making. Context in human-computer interaction (HCI) has been brought to the foreground in Dourish's (2001) theory of embodied interaction. Embodied interaction is a framework within which the physical and social context of an interaction between humans and an artefact is of primary importance. By contextualizing people's activities with computers, it becomes possible to determine why some material affordances are essential in meaning-making processes and others are less influential. Thus, it is not enough to look at a medium in isolation and identify what it is possible and not possible to do with it. Instead, researchers need to see the medium in action and remain open to the social and physical experiences that comprise embodied interaction with it.

Williams et al. (2005) for example, used an embodied interaction approach to look at the way tangible technologies that could be

manipulated in a museum in order to produce auditory effects were not used by visitors independently. Although visitors walked around the museum most often by themselves, and picked up these objects far away from each other, their movements and patterns of activity revealed the extent to which they were in constant collaboration with one another. Their interactions with the tangible auditory interfaces could be 'read' as responses to others' interactions. Similarly, in screen picture-making, what children do will depend on what they have seen their peers do and other crucial elements of the social context. The physical aspect of the experience is also of vital importance. Small details in the embodied, sensory nature of the interaction will change how the interaction unfolds and what affordances come to the foreground. For example, Bianchi-Berthouze et al. (2007) have shown how whole-body interfaces stimulate a more engaged and affective response from game-players. Thus, if children have the physical freedom to use their whole body rather than just their hands, the experience of screen picture-making will be different. This makes the physical set-up of the classroom in which screen picture-making occurs particularly important.

Some designers have responded to the complexity of context by arguing that material objects need to signal their affordances in a clearer way. Donald Norman, in his classic text *The Design of Everyday Things* (1988) argues that good design rests on the explicit nature of an object's functionality. A user will look for cues as to how they should interact with an artefact. These cues might take a social form (e.g. the user will imitate others' uses) but they might also be material. In the context of screen picture-making, a child might use the pictorial symbols available in the software to make sense of the different possibilities available to them. They will be aware of visual effects that occur when they click on these icons and what this tells them about the tool associated with this icon. They might understand quickly, even

without prior exposure, that the mouse is a control device that rests underneath the hand because of its shape. On the other hand, the mouse's two buttons might be a misleading cue, because while the right button is not used for control in software like *tuxpaint*, it has equal physical presence to the left mouse button and this might be taken as an indication that its use should be equally frequent. Thus, rather than thinking about material affordances as simply what it is possible to do with a given set of semiotic resources, we can instead conceptualise material affordances as the functions of an artefact and the way these are signalled to the user through its materiality.

In embodied interaction, affordances are not static. Another component of context that is vital in an individual's interaction with a medium is their prior experience with the medium. The affective, physical and social relationship that a user has with a medium will change over time. A shift that is often noted in the use of artefacts is the shift from conscious to unconscious use. In *Being and Time* (1962/1927), Heidegger described this as a shift from tools being 'present-at-hand' to 'ready-to-hand', and used the example of the pen that he was writing with to illustrate this change. When first using a pen as a child, it is 'present-at-hand' since we are aware of the boundaries that exist between ourselves and the physical object. Over time however, the pen will become 'ready-at-hand' as we become more involved in other aspects of the activity and use the pen unconsciously. If however, the pen were to break or the ink were to run out, our attention would once again be drawn to the boundaries between the pen and ourselves. Thus, technologies can move between being 'present-at-hand' and 'ready-to-hand' depending on contextual factors. In the case of screen picture-making, how children interact with the materialities of this practice will depend on the affective, physical and social relationship they have with the tools involved. Have they used the mouse previously? Is their attention repeatedly drawn back to the mouse, or do they become so engrossed

in use that they forget the manner in which the mouse is mediating the input-output of the interaction?

2.6 Discourse and the ‘Interpretive Community’

As described above, the affordances of a medium unfold over time because each individual’s affective and physical relationship to that medium will change. This change over time however, is not purely at an individual level – a culture’s relationship with a set of semiotic resources will also change, and this will influence how the affordances of a medium are perceived. As Jewitt and Kress (2003) describe, different cultures can be more or less invested in a set of semiotic resources. As mentioned previously, frequent use over extended periods of time will lead to affordances becoming more ‘fully and finely articulated’ (p. 1). This assertion relates to the empirical work of Labbo (1996) which found that the relative newness of the computer in the early years classroom led to the practices of screen text-making being less constrained by teachers’ expectations. On the other hand, text-making on paper was heavily constrained by a rigid set of teacher expectations about how children would enact this activity. Thus, media that are new to a particular context may be associated with a greater diversity of practice.

I would argue however, that it is a mistake to conceptualise relatively new media as ‘free’ from social constraint. While the expectations that surround such a medium might be less homogenous, they are still present. A social discourse will shape text-making in any medium, regardless of how new it is. The notion of discourse relates to how a practice is enacted and how it is talked about (Foucault, 1972); discourses are ‘systems of meaning that circulate through social life’ (Ryan & Grieshaber, 2005, p. 37). A discourse of screen picture-making

in the early years classroom comprises both what is done and a set of ideas and attitudes relating to the practice. In looking at how things are done, various features of the practice are important: the actions themselves, the manner in which they are done, the actors involved and their presentation, the resources used, and the times and spaces in which the practice is carried out (Chandler, 2007). By observing these aspects as they unfold, children will develop a perception of what is expected of them, and their practices will exist in relation to these perceptions. Through their actions, each child will contribute to the development of a discourse, mainstream or subversive, that surrounds the practice. In considering how the practice is talked about, various dimensions need to be taken into account: evaluations (what counts as good), purposes (what the practice is for) and legitimations (why it needs to be done in a particular way).

The nature of a discourse depends on the people involved. Not all communities will construct the practice of screen picture-making in a similar way. In thinking about discourse, it is necessary to make explicit the boundaries of the 'interpretive community' (Fish, 1980) that is being considered. The notion of 'interpretive community' was first invoked by Fish in the argument that meaning is made and understood not through individuals (either the reader or writer) but through communities. These communities set up how meaning should be made and the rules and strategies that should frame examples of text-making: 'it is interpretive communities rather than either the text or the reader, that produce meanings' (p. 14). In this perspective, children's text-making must be seen in relation to the social context in which they are conducting the activity, and in particular, in relation to the 'interpretive community' in which they are situated. We can think about the 'interpretive community' on different levels: it may be a specific classroom, or it might refer to the wider culture that determines how reality is constructed in that particular classroom. In education research, it is often necessary to move

between these levels of community – to think both about particular classrooms and the discussions of educational policy-makers at a national or international level. In this chapter, I focus on the latter, but in subsequent chapters drawing on empirical investigation, I relate this to particular classrooms.

Different discourses of picture-making in the early years co-exist. Gardner (1982) suggests that there are two popular discourses that surround young children's picture-making, and subsequently, two approaches that have been taken towards arts education in the early years. Some researchers and practitioners take the 'unfolding perspective' in which young children's picture-making is based on an instinctual urge for visual communication. In this discourse, 'the art teacher must play the role of the Rousseauan tutor – shielding the innocent and fragile young child from pernicious forces in the society so that his inborn talents can flower' (Gardner, 1982, p. 208). Hawkins (2002) describes the importance of the term 'self-expression' in the reproduction of this discourse. He uses Rorty's notion of the final vocabulary – words and phrases that cannot be challenged – to explain how the term 'self-expression' is rarely questioned among early years educators despite the limitations it imposes on our interpretations of children's pictures:

An ideology of self-expression which asserts that all representation is in connection (should be read in relation to) a singular, pure, pre-existing self acts to limit our understandings of the complexity of children's representations (p. 209).

In contrast, adults might conceptualise children's picture-making in much the same way they do other activities conducted by the young child: as a process to be improved through sensitive adult guidance and intervention. This type of view leads to a training approach in which children are taught a specific set of skills. The marginalisation of this

approach in the British early years system has been noted by various researchers (Welch, 1995; Holt, 1997; Hawkins, 2002). Although these discourses are in competition with one another, they do not map onto entirely discrete approaches and practitioners are likely in their everyday lives to act according to aspects of either at different times. When it comes to screen picture-making, one of these discourses may be more applicable than the other, or another discourse may be constructed altogether.

2.7 Summary

The overview provided in this chapter demonstrates the different theoretical cornerstones that support my research. I have discussed various approaches that have been taken towards signs and sign-making. In particular, I have highlighted Jakobson's assertion that signs can have different functions. In response, I have put forward four potential dimensions that exist in children's picture-making: the referential, the aesthetic, the experimental and the social. I have also, in line with the work of Barthes, Derrida and other poststructuralists, foregrounded the materiality of the sign, and its dependence upon specific social contexts. In doing this, it has been useful to draw on the terms offered by social semiotics. Within this framework, the practice of screen picture-making is conceptualized as a set of semiotic resources with distinct semiotic potential that exists at both a theoretical and actual level. Multimodality as a subfield of social semiotics has placed particular focus on the concept of affordances as a way of thinking about different types of semiotic resource. The concept of affordances, though somewhat problematic, is useful because it draws attention towards both the material properties of a semiotic resource and how it is socially constructed. In order to understand the former, I have invoked the notion of embodied interaction, and in order to understand

the latter, I have discussed the concept of the 'interpretive community' and the competing discourses that influence art education in the early years. The various concepts that have been introduced in this chapter form the basis of the theoretical approach I have taken to the research presented in this thesis. In the following chapter, this approach and the terms it comprises are used to make sense of the diverse bodies of literature that are relevant in a study of young children's screen picture-making.

Chapter 3

Literature Review

3.1 Introduction

Having decided to conduct research from a social semiotic perspective on children's picture-making via the screen medium, it was necessary for me to conduct a review of the existing literature on relevant topics. The bodies of literature I identified for review were any relating to the following topics: children's picture-making on paper and screen; affordances of screen text-making; educational practitioners' approaches to picture-making; and screen use in the early years classroom. Literature on these topics is examined in the first two sections of this chapter. The first section focuses on young children's picture-making and the approaches taken by practitioners and researchers towards it. The second section focuses on screen media in early learning and the affordances of the screen medium that other researchers have identified as significant in this context. In the final section of the chapter, I use the previous research that has been conducted in these areas, as well as my theoretical framework (outlined in Chapter 2), to construct and explain the research questions that have guided my research.

3.2 Picture-making

I am interested in meaning-making as it occurs within the pictures of 4-5 year olds. I use the term 'pictures' to refer to 2D visual products that may incorporate drawing, the use of ready-made images (e.g. stickers, stamps), collage and stencilling. Pictures can be made on paper or on screen, but the literature on paper picture-making is far more developed than the literature on screen picture-making. Furthermore, the majority of this literature focuses on drawing rather than other aspects of

picture-making. I therefore use drawing research as the main starting point for discussing picture-making more generally and how it may be similar or different when it occurs via different media. The first half of this literature review will focus almost exclusively on paper picture-making, and in particular on drawing. I will initially outline the role that picture-making has in early learning, how it is enacted in different contexts (home and school), and how it is conceptualised by significant adults in a child's life (parents/carers and practitioners). I will then consider the different theoretical and methodological approaches that have been adopted when researching children's paper picture-making. Finally, I will consider certain sub-themes in research into young children's picture-making: picture content, picture composition and the relationship between narrative and picture-making.

3.2.1 The role of picture-making in early learning

There have been two versions of the Early Years Foundation Stage (EYFS) curriculum in use during the time in which my research was conducted. The current statutory framework, published in March 2012, highlights three principal areas in child development around which early learning should be organised: communication and language; physical development; and personal, social and emotional development. Picture-making relates to all three of these general areas. It is also explicitly discussed within one of the document's specific areas of development: expressive arts and design, which has the purpose of 'enabling children to explore and play with a wide range of media and materials' (p. 5). Prior to this, the curriculum comprised similar goals but these were ungrouped, so that in total, there were 69 separate learning goals spanning communication, physical activity and personal development. Taking the curriculum into account is important for understanding what young children learn about picture-making since it influences the

outlook of practitioners, who are significant figures in the lives of young children (Roberts-Holmes, 2012; Stephen, 2010). The approach that children take towards picture-making is influenced by interactions with these adults (Rose et al., 2006; Burkitt et al., 2010).

Various discourses are relevant when considering the view that early years practitioners in the UK take towards children's picture-making. As mentioned in the previous chapter, Gardner (1982) suggested two competing discourses that surround children's creative expression: the 'unfolding' perspective and the 'training' perspective. Elements of either discourse can be seen in the early years curriculum and classroom. Creative expression is positioned in the curriculum as relating to both emotional and physical development. Pictures are seen as a way for children to express the emotional aspects of everyday experiences and explore significant relationships in their lives (c.f. Wilson & Wilson, 1977; Hawkins, 2002). Picture-making is simultaneously constructed however, as a way for children to become more adept in their manipulation of tools, particularly inscription tools that will be key in the development of their writing skills (Wu, 2009; Anning, 1999). Because of these competing discourses, there are various pressures on the early years practitioner. While they are often advised against interfering in children's picture-making (e.g. Kolbe, 2005) and are therefore reluctant to do so (Welch, 1995; Holt, 1997), they are also made aware that picture-making is one way for children to develop the skills they bring to writing and a key component therefore of 'writing readiness' (Anning, 2003). In this context, the skills a practitioner is likely to focus upon when observing picture-making in their classroom include the motor control involved in the manipulation of the inscription tool, the use of imaginative oral language to accompany picture-making, and the ability to communicate with others through an organized symbolic system.

While the perspective of practitioners on picture-making is shaped by the curriculum and their pedagogic approach, interactions that surround picture-making at home have been found to be less prescriptive. Anning (2002) carried out a longitudinal case study following two preschool aged children over three years as they completed drawing activities at home and in a range of educational settings. The children were observed as they engaged in drawing, and significant adults in the context were observed and interviewed in relation to the beliefs they held about children's drawing practices. Picture-making at home was found to be an important source of mutual engagement for parents and children. Parents negotiated the process of picture-making with their children and were happy for pictures to be incorporated into experiences of multimodal and dramatic play. The resulting pictures were often full of movement and flux and did not clearly represent specific objects. While parents readily engaged in the creation of such pictures, Anning found that practitioners valued this type of picture-making far less. To the latter, these pictures were understood most often as 'scribble', while for the former, the stories behind the pictures were fully appreciated.

The discrepancy between home and classroom can be understood in terms of practical issues (e.g. adult: child ratio) but also through the discourse at work in either setting. Based on observations and interviews in the educational contexts, Anning (2003) suggested that practitioners in early years settings felt under pressure to make sense of pictures in terms of emergent literacy. That is, rather than engage with the drawing process as distinct from writing, it was understood as a form of mark-making that would lead to writing. As a result, practitioners were likely to provide positive feedback when a child produced a clear row of circles because this demonstrated 'writing readiness' in terms of tool use; or when a child produced a visual representation of a discernible object in the everyday world as this was taken to

demonstrate 'writing readiness' in terms of communicative intention. The latter would help to explain why surveys conducted by Rose et al. (2006) found that most children perceived their teachers as valuing realistic representations rather than abstract picture-making. The same surveys showed that the children themselves also placed more value on referential picture-making. This is unsurprising since they are likely to align their opinions with their perceptions of the opinions significant adults in their life.

Of course, the distinction between home and school depends on the specific characteristics of either environment. The type of educational setting a child attends will have an impact on their approach to picture-making and the pictures they produce. Holt (2007) has noted the 'essentially passive nature of much early years art teaching' (p. 93), while Anning (2003) has suggested that when intervention does occur, it is often a response to the pressure to help children to become ready for writing. Of course, not all practitioners will be passive to the same extent, and not all will offer guidance of the same type. Cox and Rowlands (2000) compared pictures that were made by children in Montessori, Steiner and traditional, state schools. They asked blind raters to note differences between pictures that were made by the children in a free-drawing task. They noted that children from the Steiner schools tended to create drawings that filled the whole page, were more colourful, used more shading, and contained more fantastical representations. The results of this study are difficult to interpret however, since choice of educational setting is likely to be related to other aspects of parental background. For example, the parents of children in Steiner schools may have been more intent on exposing their children to a variety of visual stimuli at home.

3.2.2 Research into picture-making

Researchers have taken various approaches to the analysis of children's drawings. The development of drawing has been a popular topic of study within education and psychology for more than one hundred years and various stage models of drawing development have been put forward in this time (e.g. Lowenfield, 1947; Machover, 1949; Harris, 1963; Koppitz, 1968). Generally, these models chart the development from precursory activities, such as scribbling, to the use of visual schemata and finally to attempts at realism. One of the results of taking a developmental approach to drawing is the use of drawings as assessments in development. Thus, in the first half of the twentieth century projective drawing tests were designed to assess personality, emotional state, relationship to the subject matter depicted, intelligence, and the possibility of neurological impairment.

More recent findings suggest that such measures are unreliable. Current thought on children's drawing is instead defined by the recognition that there is 'no singular, reliable way to interpret content' (p. 8, Malchiodi, 1998). This does not mean that children's drawings cannot be used in order to understand better children's lives and experiences, but rather that projective drawing tests are unable to take into account the multi-dimensionality of drawing and picture-making (Golomb, 1992; Tharinger & Stark, 1990; Betts, 2006). The field of art therapy, which has grown in popularity over the last twenty years, has stressed the importance of understanding the many dimensions at work in children's drawings, the need for:

A broad understanding of how children used art for many purposes – for mastery, for self-expression, for self-definition, and for addressing stress, emotional problems and trauma' (Malchiodi, 1998, p. 14).

To Malchiodi's list can be added various other possible purposes, including the physical and visual pleasures that drawing entails, and its opportunities for communicating with others. In order to access this multi-dimensionality, researchers and practitioners have been encouraged to engage not simply with the images that children produce but also with the dialogue and activity that surrounds visual expression.

In encouraging researchers to engage with what children have to say about the drawings they make, as well as the drawings themselves, there has been a move towards more contextualised accounts of drawing in general (Cox, 2005; Hawkins, 2002). A phenomenological view of children's drawings – prioritising the experience of the event and children's understanding of it – would need to take into account various elements of the context. For example, the availability of drawing materials and prior exposure to these materials would be important for understanding how a child approaches a drawing task. Also important would be previous experiences of picture-making; the presence of colouring books and pre-drawn images; the art that surrounds the child and the strategies used by practitioners when engaging with children regarding their picture-making. While it may not be feasible to take all of these variables into account in a single study, researchers such as Frisch (2006) have argued that efforts must be made to contextualize each picture-making experience and more research should focus on these variables. The medium through which a picture is made interacts with these variables, as well as introducing new ones, such as what the medium can do and the child's perception of what the medium is for. The potential for the artistic medium to influence both process and product has been shown through various studies. For example, Golomb (1974) compared children's construction of a human figure on a 2D surface with their construction of a human figure in play dough and found some marked differences in how they achieved this representation. However, comparisons of picture-making between page

and screen have been extremely limited; to my knowledge, only the work of Matthews and Jessel (1993) and Labbo (1996) has explicitly drawn this kind of comparison in the context of early childhood.

In order to take contextual variables into account, Frisch (2006) has championed contextual drawing analysis in her study of Norwegian preschoolers' drawing behaviours, making use of the dialogues surrounding the picture-making process, the directive talk of young children (Dyson, 1986), interactions with expert others, and the use of material objects as props in the drawing experience. In her study, Frisch worked with preschool staff and 25 children aged 1-6 years of age over two months on a drawing project entitled 'Myself'. In order to take context into account in her interpretations of the drawings created, Frisch asked the preschool staff to write down their observations of the children drawing. She also conducted interviews with the staff about their observations, though she did not conduct any of her own observations. Frisch concluded that 'the drawing and drawing process are a kind of print of the individual's social relations and contextual conditions' (p. 81). Thus, the context in which a picture is made – a context created by other children and the preschool staff – will shape both the process and product of picture-making. The study also emphasizes however, that there is space for both the individual and the community in this approach to picture-making. While all pictures are made in a sociocultural context, individuals can actively respond to this context. Each individual has a unique 'sociocultural history' (p. 82) that will be visible through their picture-making and the pictures they create.

Cox (2005) argues for a similar approach to Frisch on the basis that contextual information and a child's talk in particular, will offer a greater insight into the interests and passions that lie behind a drawing: 'talk and drawing interact with each other as parallel and mutually transformative processes' (p. 123). Cox develops this argument in

response to her observations of children drawing and painting in the naturalistic setting of the nursery classroom. Over the course of one year, she made notes on children's picture-making activities and analysed the purposes children talked about with regards to their picture-making. These purposes were often not visible in the picture product. The findings from the study suggested that in the everyday life of the child, texts fulfil a purpose beyond their reception at the hands of an adult, and this purpose can only be captured through detailed and contextualised observations of picture-making. Thus, over the last 30 years, research into children's picture-making has shifted from a focus on projective drawing tests to an emphasis on contextualised accounts of picture-making that position the activity in relation to both the individual and the wider social context.

3.2.3 Picture content

Very young children take tactile pleasure in making marks on surfaces with various materials. Sometimes they pay attention to the marks they have made, while at other times, this appears to be of little interest to them. As they become toddlers, they start to integrate their mark-making with other forms of communication and these combine to form 'the visual equivalent of dramatic/imaginative play bouts' (Anning, 2003, p. 12). Although the pictures produced from this play are often misunderstood by surrounding adults as 'scribbles' (Anning, 2002), the process through which they are created demonstrates that these drawings are often linked to the world around the child, albeit in a mutable and fluctuating manner.

Between the ages of 3-4 years, children begin to more consistently connect mark-making with the world around them. They show a desire to talk about the drawings they have created and create narratives to

explain what they have represented (Coates, 2002). These stories often go beyond what they have been able to or have chosen to include as discernible representations in their drawing. Gardner (1980) describes this process as the 'romancing' of the scribbled image. In his observations of young children drawing, Gardner found that they would often verbally elaborate on what they had put on paper, offering a greater deal of representational power to their pictures through their talk. As with younger children, meanings attached to drawings made at this age showed a high degree of mutability, so that a drawing labelled by the child as one thing might soon be labelled as something quite different (Hopperstad, 2008). These are similar patterns to those seen in emergent writing, where nonsense letter strings are 'read' out loud by the child in various ways at different times.

Drawing between the ages of four and six years old is characterised by the development of visual schemata (Golomb, 1992; Cherney et al, 2006). Schemata can be understood as steady templates of objects. These templates are not imitations of reality but rather exist to suggest the appearance of elements in reality (Thomas & Silk, 1990). Thus, a drawing of a human figure – the most popular schema among this age group – is not an attempt to convey the reality of perceiving a human figure, but instead conveys a human figure through various essential elements (head, body, legs etc.). This was described by Luquet (1927) as *intellectual realism*: representations that are based on an internal model with defining or primary features that take priority. In practising the human schema, drawings of family members, peers and the self are particularly common. As well as developing a robust schema for the human figure during this stage, children are likely to develop schemata for houses and other important environments, as well as choosing to represent objects of personal and emotional significance (Dyson, 1986; Malchiodi, 1998; Thompson, 1999). Beyond these static representations, researchers have documented the tendency of

children to include action in their pictures and to see the elements in their picture as interacting with one another (Anning, 2003; Frisch, 2006).

The literature on children's picture-making has typically focused on discernible representations of objects and people, or as I described it in Chapter 2, the 'referential dimension' of picture-making. There is a need however, to extend our focus and consider the potential for other types of picture that children might make. Kolbe (2005), for example, has highlighted the gap in literature exploring children's picture-making when it prioritises the aesthetic dimension. Kolbe argues that children's pattern-making is often ignored because it is not a favoured art form in the Western world. Kolbe also stresses the place of experimentation in children's picture-making, particularly when a new medium is being used. Children's experiments with visual media have not been analysed in a systematic way. Most often, they have been treated as a necessary precursor to the creation of discernible visual representations. There is no evidence however, to support the assertion that experimentation can only take place in the early stages of development in picture-making; indeed, experimentation with the medium continues to be a key principle in later art education (Eisner, 2004). The argument for a closer look at children's abstract picture-making is even more convincing when we consider the research of Winner and Gardner (1980), which found that a majority of 4-5 year olds stated a preference for abstract paintings over clearly referential paintings.

Picture content cannot only be understood in developmental terms. Individual differences will also lead to distinct tendencies in picture-making. These differences manifest themselves in various ways. For example, Thompson (1999) has shown that while the self-initiated drawing of some 3-5 year old children is based upon general and varied subject-matter, other children adopt the practices of a subject-matter

specialist, repeatedly practising the same schema in order to produce a series of very similar drawings. Thompson collected pictures made by children in preschool and kindergarten settings over ten years. Analysis of these pictures, which were collected in the children's personal sketchbooks, suggested that children's choices about what to draw shaped the way their drawings developed. The distinction between generalists and specialists builds on some of Gardner's (1982) earlier suggestions about the different types of drawer: he distinguishes between self-starters in drawing and those more reluctant to begin, as well as making a distinction between 'patterners' who show an interest in the features of visual design (such as colour, size and shape) and 'dramatists' who focus on the actions and situations communicated through their artistic expression. Patterners are typically more reluctant to make comments about their drawings unless prompted, while dramatists engage enthusiastically in a dialogue which often goes beyond the content of the drawing and the drawing experience.

As well as individual tendencies, various gender differences have been suggested in terms of the subject matter that children depict (Flannery & Watson, 1995). Researchers have suggested that boys and girls choose to depict different things as a result of their distinct experiences of socialization (Tuman, 1999). Golomb (1992) found that boys were more likely to represent acts of violence, destruction and competition, while girls were more likely to depict scenes of tranquillity, family and romance. On the other hand, Gardner (1982) suggests, on the basis of naturalistic observations, that gender differences exhibit themselves in the nature of the expression. That is, girls are more likely to engage in multimodal expression while they draw, for example singing while they draw and using dramatic voices and symbolic play, while boys are more likely to contain themselves within the medium of drawing. This contrasts with Anning's (2003) observation that young boys are more

likely than girls to continue to treat drawing as one tool in dramatic and imaginary play.

Cultural differences have also been shown to have an impact on what children include in their pictures (La Voy et al., 2001; Wilson & Wilson, 1979; Andersson, 1994). These differences are thought to stem from differences in the graphic models that are provided by the wider culture. Such graphic models are available through the drawings surrounding the child, but are also visible in the wider visual culture, including television and posters. For example, Wilson (2002) found the drawings of Japanese kindergartners to be reflective of the popular *Manga* style of drawing, which children are exposed to through television, comics and the drawings of others. As well as cultural differences across space, Thompson (2003) suggests that time has had a crucial and often neglected influence on the content of children's pictures. Thompson observed children as they made pictures at Saturday art classes, when they had completely free choice over the subject matter they would include in their pictures. The place of popular culture in these pictures prompted her to question the way adults conceptualise the picture-making of young children. Thompson argues that theories predominating in the early years classroom are designed around 'good old-fashioned child art' (p. 136), which relates to everyday and immediate experiences. These theories fail to engage with popular culture, through which children constantly construct a 'shared repository of images, characters, plots and themes' (p. 142) that often occur in children's pictures, so that 'the directly experienced is often left behind' (p. 144).

3.2.4 Picture composition

Research on drawing composition has tended to focus on children's use of colours within their pictures, and the organisation of space. These will be two important facets of my analysis of picture composition. However, in an attempt to engage more generally with picture composition (rather than simply drawing), I am also interested in children's application of ready-made images to a canvas. Of course, the latter relates to the presence of colour and the organisation of space, but its impact on composition extends beyond just these effects.

Before the age of four, the use of colour by children in their drawings tends to be subjective (Golomb & Farmer, 1983). Furthermore, the majority of three year olds have been found to use just one colour in their drawings – suggesting that they consistently prioritise form over colour (Golomb & Farmer, 1983). Typically, children demonstrate the first signs of symbolic colour use at the age of four. They consider the colour choices they make, are more likely to use a greater range of colours, and will sometimes associate the colour they are using with the colour of the object in reality. The likelihood of this depends on the object that is being represented. For example, grass is more likely to be green than a person to be flesh-coloured. This tendency is strengthened among five year olds, who also begin to pay attention to the consistency of colours in the contours they represent e.g. using the same colour for the outline of a figure (Golomb & Farmer, 1983). There is, by this age, invariability in certain colour choices – grass is always green – and these behaviours are consolidated among 6-8 year olds (Golomb & Farmer, 1983).

Beyond the colour of an object in reality, negative and positive associations with objects and colours will also play a role in colour choice. Burkitt et al. (2003) found that children aged 4-11 years old consistently used their preferred colours for depicting positive subject

matter (e.g. in representing a 'nice man') and their least preferred colours for depicting negative subject matter (e.g. a 'nasty man'). This finding was true of even the youngest children in the sample. While preferred colours were evenly distributed across individuals, black was most frequently cited as the least preferred of all the colours. Without specifically questioning children about their subjective impressions of different colours, there is no way of knowing whether their use of certain colours is the result of these impressions or other factors, such as availability or proximity (Winner and Gardner, 1981). Thus, while it would be interesting to compare the subjective associations of colour used on screen with colour used on paper, this is not something I will be able to do in this study since children's recorded talk will be spontaneous rather than guided. I will therefore focus on colour range and the relationship between the colours used and the visual elements depicted.

As well as colour, another compositional choice that children make in their pictures relates to the organisation of space and the placement of elements within the space of the page. In analysing this aspect of composition, researchers have used the subjective notion of 'balanced composition' to compare children's drawings. In a picture that possesses balanced composition:

All such factors as shape, direction and location are mutually determined in such a way that no change seems possible... an unbalanced composition looks accidental, transitory and therefore invalid (Arnheim, 1974/1954, p. 20).

As well as position, the balance of a composition depends on the salience of different elements, which in turn depends on their size, focus, tonal contrast and other properties (Arnheim, 1974/1954). The latter properties are particularly relevant when considering how children incorporate ready-made images into their pictures, and the complexities

of achieving balanced composition when such elements have been added. Furthermore, salience can depend on cultural factors. Recognisable schemata for example, may have more salience over elements on the page that do not have an immediately obvious referent (Kress & van Leeuwen, 1996). The variety of factors that influence whether a sense of balance is achieved mean that it is a difficult, if not impossible, feature to measure in an objective way. Despite this, researchers have developed scales through which to make assessments about the presence and type of balance in a picture. In particular, Winner and Gardner (1981) and Golomb and Farmer (1983) have attempted to evaluate balance in children's pictures. While both scales fail to incorporate all of the elements mentioned above, they offer a good starting point for thinking and talking about the way children approach composition in a 2D space. These models, though more than two decades old, remain key tools in understanding the organisation of space in children's pictures.

The scale used by Winner and Gardner (1981) ranged from unbalanced compositions, to balance through a complete fill of the page, balance through symmetry and finally balance through dynamic asymmetry. Golomb and Farmer (1983) created a similar scale, but added the possibility of proximity and alignment without symmetrical planning, and a stage of thematic unity visible through the inclusion of a ground- and sky-line and possible without the achievement of dynamic asymmetry. The latter researchers suggested that until the age of five, the placement of elements on the page tends to depend on convenience and the availability of space. On the other hand, Winner and Gardner found that from as young as four years old, children were more likely to create balanced pictures than unbalanced pictures. Furthermore, in a copying task, four year olds were more likely than older age groups to 'correct' balance in the picture they were copying. This would suggest that many of the paper pictures made by children in this research will

possess the quality of balance; it will be interesting to see whether this quality is also apparent in the pictures that are made on screen.

Literature on the use of ready-made images within children's pictures is severely limited. In conducting comparisons of composition between paper and screen, it is vital to ask specific questions of image use. Are images applied in a referential manner or as elements of design? How are they related to other aspects of the picture? What is the visual impact of their application? Research conducted by Burnett and Myers (2006) on screen text-making among 8-11 year olds suggests that ready-made digital images are generally applied to texts in a considered manner by children, who show 'considerable awareness of the semiotic potential of these elements' (p. 20). Burnett and Myers based this argument on findings from two studies. In the first study, two classes of children (one class of 8-9 year olds and one class of 9-10 year olds) participated in an email project, collaborating via email in order to create *PowerPoint* presentations. The researchers analysed the texts that were created: both the emails and the presentations composed. Further data came from a study of six 10-11 year olds, which involved observations of these children as they made texts on screen using *Word* and *PowerPoint* and follow-up interviews about their experiences. In these contexts, images available within text-making software were shown by the researchers to inspire the development of creative textual content. Having said this, interviews conducted as part of the research also suggested that some children felt limited by the availability of ready-made stimuli. Thus, the researchers suggested that 'digital resources may both prompt and confine individual composition and creativity' (p. 22). This study gives us an insight into the role that images can play in multimodal text composition among slightly older children. Are these findings applicable in the case of picture-making among 4-5 year olds, and is this common to both ready-made images

available in paper picture-making (e.g. stickers) and those available in software like *tuxpaint*?

3.2.5 Pictures and narrative

Contextualised accounts of picture-making have drawn attention to the potential for narrative to be involved in the picture-making experience. Although practitioners may be more likely to seek static representations within a child's picture, children can choose to represent elements in flux and narrate the way that these elements change over time (Anning, 2003; Thompson, 1999). Narrative picture-making is discernible through the talk of children; it also tends to be accompanied by multimodal expression. Thus, pictures that comprise narrative will be made amidst singing, role play, dance, movement and the use of dramatic voices (Wright, 2012). While examples of narrative picture-making have been recorded, the narratives constructed in this manner have not been analysed systematically. Due to the paucity of literature in this area, I have found it necessary to borrow the analytical tools of narrative research more generally in order to make sense of the relationship between picture-making and narrative, and how this is influenced by the medium used to create the picture.

Research has shown narrative to be incredibly prevalent in the world of the young child, at least in certain societies. The longitudinal study of Preece (1987) highlighted just how often spontaneous narratives are in the everyday life of a five-year old in Canada. Preece recorded 131 conversations involving three children aged between five and six years of age over 18 months. The conversations occurred as the children were being driven to and from school each day, and comprised almost 90 hours of recorded material. The material was analysed in order to classify children's narratives. Preece developed a 14-category

classification of children's narratives, ranging from personal anecdotes to original fantasies to retellings. The most common type of narrative in this study was the anecdote; anecdotal narratives accounted for more than 70% of all narrative. On the other hand, original fantasies were rare. However, Nicolopoulou (2008) suggests that Preece's categories are not mutually exclusive. For example, children can borrow characters from the world around them (leading to a narrative retelling) and simultaneously portray these characters in original settings and scenarios (leading to an original fantasy). She argues for a different model for analysing children's narrative whereby the focus is on the purposes and intentions of children in creating narratives, rather than on superficial features of the narratives they produce. This is a similar shift to the one that has occurred in approaches towards children's picture-making (Frisch, 2006; Cox, 2005).

As well as categorizing types of narrative, Preece (1987) focused on the quality of narrative development. For example, she suggested that in visual media retellings, there was less structural cohesion and sequencing of the different narrative elements. Other researchers, such as Fey et al. (2004), have attempted to quantify narrative development and produce measures of narrative quality. In the work of Fey et al., narrative quality is dependent upon scores in five aspects of narrative talk: characters, physical settings, ending and resolution, language sophistication and plot complexity. While the rigidity of these scales makes them less appropriate for exploring the narrative pictures of young children, they do highlight the importance of exploring narrative development as well as simply the presence of narrative in the context of picture-making. Thus, narrative may be present in both paper and screen pictures, but is it as well-developed within each medium?

In studies of children's narrative, it is typically the temporal and causal sequencing of events in the narrative that have received the most attention. Narrative research:

tends to focus more or less exclusively on the formal structure of narratives and to neglect both their symbolic content and the ways that children use narrative for diverse modes of symbolic action, not least in the construction of reality and identity (Nicolopoulou, 2008, p. 242 – 243).

Theories of children's narratives argue that aspects of narrative other than plot are symbolically and emotionally significant (Bloome et al., 2003). In particular, characterization is an essential part of narrative that has typically been neglected in research on children's narratives. To fill this gap, Nicolopoulou & Richner (2007) analysed the representation of character in stories created by 30 children aged between three and five years of age over the course of one school year. In this time, the children dictated a total of 617 narratives to practitioners in the classroom during their free-flow activity time. The characters in these stories were analysed independently of plot and each was categorized as actor, agent or person. Actors are non-mentalistic characters; agents have some psychological capacities but typically display intention-in-action (e.g. 'he is trying to open the door'); while persons have complex beliefs and intentions that direct subsequent action (e.g. 'he wants to know what's in the room so he tries to open the door'). The researchers found that both across children and within individual children, there appeared to be a relationship between age and the complexity of the character representation. The older the child, the more likely they were to produce narratives containing characters that counted as agents or persons. When narratives are inspired by or accompany picture-making, will the complexity of character representations be consistent across medium?

As well as considering the type of narrative constructed and characterization, it is also necessary to consider the role of scene-setting in narrative picture-making. Scene-setting is an important aspect of narrative in the context of picture-making since it is possible and popular to represent place in 2D pictures. For example, Golomb and Farmer's (1983) definition of thematic unity relates to the inclusion by children of a groundline and skyline which in turn creates the impression of a landscape. In Labbo's (1996) ethnographic study of screen text-making, she noted that children often constructed the screen as a landscape that was then inhabited by characters. For some children, the landscape acted as a starting point for imaginary activity and narrative. As well as place, scenes can be created through the positioning of activity in time; thus, I will look for evidence of scene-setting in picture-inspired narratives in terms of both space and time.

3.3 The influence of screen media

To what extent does the research on paper picture-making relate to the realities of screen picture-making? While the literature on screen picture-making is scarce, there is a small but emerging body of research looking at screen text-making and screen media in children's meaning-making more generally. Exploring this research made it possible for me to frame and plan my research into screen picture-making. I begin this section with an overview of the role that screen media is assuming in early learning, including the extent and type of popular use, and the approach adopted by practitioners towards its integration into the early life of the child. I then describe research projects which investigate the material and social affordances associated with screen text-making, focusing on examples within early education research.

3.3.1 Screen media in early learning

Literature reviews in the field have highlighted the paucity of empirical research into the use and influence of screen media in early learning (Labbo & Reinking, 2003; Burnett, 2010). The majority of studies that have been conducted in this area have used a cognitive psychological model of the interaction between child and technology, rather than adopting a sociocultural conception of the interaction (Lankshear & Knobel, 2006). Furthermore, the applications most often considered have generally been those used to promote 'old learning' – learning that typically occurs in an offline environment, such as print literacy. Thus, very few projects have focused on the social interactions that surround young children's interaction with screen media, and the way that these technologies are used to engage with and create texts in new and distinct ways (Resnick, 2006).

Survey data in America and Britain suggests that the level of Information and Communications Technology (ICT; computers, mobile phones etc.) use among young children in the home is high and continues to rise. An American survey by Calvert et al. (2005) found that a majority of 3-6 year olds had used a computer according to their parents, although only a small proportion of these were using computers on a daily basis. In contrast, in a more recent survey of 56,000 American households, DeBell and Chapman (2006) found that a majority of nursery-aged children were using a computer at home on a regular basis, and 23% of all the children surveyed were using the internet on a regular basis. Marsh et al. (2005) conducted a similar survey in the UK with 1852 parents and found that children's typical daily screen use (including television, computers etc.) was 126 minutes. This was generally considered to be healthy by parents, who noted that the same amount of time was spent playing with non-ICT toys each day. On a typical day, 53% of the children surveyed (aged between 0

and 6 years of age) used a computer at home. For most of the children, this use was for less than an hour, but for 8% of all the children surveyed, their computer use exceeded one hour.

The ingenuity of young children exploring new technologies in informal learning spaces has been highlighted through the ethnographic and case study work of Marsh (2004) and Mavers (2007). Adults and older siblings in the home have been shown to engage openly with children's exploration and learning in digital environments. However, Stephen et al. (2008), in their research study *Entering e-Society*, noted the discrepancy between parents' generalised approach to ICT and children's more discriminating attitude towards different types of digital environment. In this longitudinal study, the researchers conducted 19 case studies of families with children aged between 3 and 5. Through five rounds of data collection over 1.5 years, various methods were employed in order to engage with the technology practices of children in these families. Interviews, video recordings and discussions around texts produced by the children (e.g. photographs) suggested that parents tended to underestimate the scaffolding involved in children's technological competence, and typically assumed 'a generalised interest in the competency with new technology on the part of their child' (p. 18). In contrast, children made comments relating to specific pieces of technology, and tended to favour smaller pieces of technology over the desktop computer.

As well as this gap between the outlook of children and adults in the home, there seems to be a high degree of uncertainty among practitioners in early years' settings as to how screen media should be integrated into learning. Findings made in nurseries and preschool settings have focused on practitioners' lack of confidence in facilitating ICT use among young children (Chen and Chang, 2006; Plowman & Stephen, 2005). Thus, formal educational settings tend to be low on

technology use in comparison to experiences in informal settings. It has been commented that this could lead to a tension between the identities children construct at school and at home (McTavish, 2009). In both contexts, interactive screen media is typically enacted and conceptualised as game-playing; the potential for the screen to act as a creative medium has been underestimated (Resnick, 2006).

Few researchers have looked at text-making on screen, and this at least partly reflects its scarcity as a practice encouraged among young children (Burnett, 2010). Within this landscape of research, there have been some important exceptions. For example, Schiller and Tillett (2004) conducted an action research project with 7 year olds, in which the children created digital images in order to express and communicate their thoughts about school. The researchers found that the unfamiliarity of the medium positioned both the children and the teachers as students in this activity. This produced new opportunities for exploratory learning. The study highlighted the extent to which technologies could be powerful tools for learning not simply through their physical properties, but also in their capacity to reconfigure social relations and modify the practices of those in the learning environment.

3.3.2 Affordances of screen media in action

The work of Diane Mavers, particularly her case study (2007) of an email exchange between a 6 year old girl, Kathleen, and her uncle, has focused on the distinct affordances of the screen medium. Conducted in a social semiotic framework, the case study suggested that Kathleen's choice to use the computer to communicate via email led to new constraints and opportunities in her meaning making. Four email messages sent by Kathleen were the subject of a semiotic analysis by Mavers that focused on the words, punctuation, spacing, spelling,

grammar, sequencing and visual presentation employed. By understanding and analysing the email as an example of semiotic design, the complex properties of the technology were explored. Thus, Mavers suggested that the presence of a networked computer led not only to differences in Kathleen's semiotic design, but to essential differences in the way that she presented herself to the world and enacted a social relationship with her uncle. On the computer, Kathleen dedicated less time and concern to the accuracy of her punctuation, spelling and grammar. These features were associated with formal writing, which was in turn associated with writing on paper. Writing on screen was a less constrained process, and one that facilitated direct communication between Kathleen and her uncle, rather than being mediated by other adults interested in the 'correctness' of the written text.

Potential shifts in representation and communication that occur when children use the screen as a medium for text-making have been highlighted since the 1990s. Matthews and Jessel (1993) compared children's drawing on paper with their drawing on screen using the mouse as an input device. They found that children produced similar products in either medium, and followed a similar sequence of activity. On the other hand, Labbo (1996) conducted a qualitative semiotic analysis of kindergartener's symbol use while on a computer and suggested that the computer offered 'unique support and mediation for children's construction of meaning' (p. 381). While the study showed some similarity in the types of meaning making that occurred on screen and on paper (for example, 'nonsense'-letter strings were used by children in both situations), children 'seldom restricted themselves to the teacher-sanctioned view of the screen as a piece of paper' (p. 377). In order to work outside of these adult-imposed parameters, the computer screen was constructed by the children as more than a page: as a landscape, a stage, a playground or a canvas.

The talk of the children in Labbo's study as they used the computer suggested that they perceived and constructed the screen medium in a variety of ways and that there was more diversity in these constructions than was evident in their use of paper. Labbo suggested that this was because the screen was without such clear teacher-led parameters. This validates a theoretical premise of multimodality: that as modes and semiotic resources become increasingly familiar, their affordances are more 'fully and finely articulated' (Jewitt & Kress, 2003, p. 2). Thus, the computer in the classroom existed as a set of new and unfamiliar semiotic resources and this led to more diversity in its use. Furthermore, the study highlights the importance of power dynamics in the process of articulating affordances; the implication in Labbo's discussion was that with time, computer use would be increasingly teacher-led and the creativity demonstrated by the children when using the screen would go into decline.

Not all research has demonstrated this pattern in examples of text-making on the computer. Ormerod and Ivanic (2000) conducted a detailed textual analysis of project work created by children as they moved from Year 4 to Year 6. The researchers analysed textual artefacts of project work and then conducted text-based interviews with children in order to explore the ways in which physical characteristics of the projects could be related to the wider literacy practices and life experiences of the children. The projects were treated by the researchers as testaments to the deliberate decisions made by children regarding material and method and these decisions were in turn representative of the child's sense of self and the way in which they made sense of reality. As the children grew older, the researchers noted that the physical presentation of their projects became increasingly similar, partly through the growing use of a computer to make the projects. They took this to reflect an ideal of 'the-project-as-academic-artefact' (p. 101) that became more prevalent as the children

progressed through formal education. The researchers expressed a concern that this ideal, facilitated by screen text-making, would create less variability in the physical characteristics of children's work and would lead to increasing standardisation among younger children. This concern contrasts with Labbo's suggestion of greater diversity in relation to screen text-making. The difference is likely to be the result of the kinds of evidence that either project considered and the lens of interpretation through which this data was made sense of. We may need to look at texts in new ways in order to see the diversity and constraints they entail. Both Labbo (1996) and Mavers (2007) paid attention to features that were unique in semiotic design via the screen medium e.g. font type, size and colour, while these had not been explored by Ormerod and Ivanic (2000).

3.4 Research Questions

In exploring theoretical perspectives on meaning and medium, and having reviewed the literature relevant to children's screen picture-making, the following questions have emerged as central to my research:

RQ1: How is children's screen picture-making similar/different to their paper picture-making?

RQ2: What are the distinct affordances of screen picture-making?

RQ3: How is screen picture-making enacted in the early years classroom environment and what is the discourse that surrounds it?

RQ4: How do early years practitioners conceptualise screen picture-making and do they see a role for the activity in early learning?

3.5 Research Approaches

To respond to these research questions requires not only distinct theoretical strands, but distinct approaches towards empirical investigation. In the following chapter, the focus will be on the methods I employed in order to collect and analyse my data, but I wish to briefly outline here the different approaches I took towards the questions above and explain how these relate to the theoretical frameworks that I have introduced.

3.5.1 Experimental Comparisons

In order to compare young children's picture-making on paper and screen and to explore the distinct affordances of the latter (RQ1 and RQ2), I decided to conduct experimental comparisons of children's picture-making on paper and screen in order to uncover some of the continuities and discontinuities between these media. Previous research on drawing suggested that it would be appropriate to focus on picture content, composition and narrative in children's picture-making. Are the themes present in the literature on paper picture-making applicable when picture-making occurs on screen? If there are differences in making sense of screen picture-making, how can these be related to both the material and social affordances of the medium? In making sense of these differences, it was necessary to draw on the theoretical concept of meaning functions (Jakobson, 1960) and to note

when there was a shift in the priority of the sign-maker e.g. from the referential to aesthetic dimensions of picture-making.

Various affordances may emerge as important in understanding the differences between paper and screen picture-making. The possibility of readily incorporating complete images into screen pictures is an example of a material affordance that may be 'semiotized' (Engblom and Bjorkvall, 2010) by children. Furthermore, the unfamiliarity of the medium within the classroom setting of the children may lead to certain social affordances. For example, children may be more willing to experiment with this medium because the uses associated with the medium are less 'fully and finely articulated' (Jewitt and Kress, 2003, p. 2). In order to link patterns of use with the affordances of the semiotic resources on offer, I decided that it was necessary to look at both the product through a visual analysis and to consider the process through an analysis of the talk surrounding picture-making. By committing to an analysis of both product and process, I was engaging with an established tradition of contextualized research into children's picture-making (e.g. Frisch, 2006).

3.5.2 Naturalistic observations

Picture-making is a social phenomenon enacted over time and in context. Another approach was needed in order to understand how affordances of screen picture-making are co-constructed through use and refined through social exchanges in the early years classroom (RQ3). In order to investigate these issues, I decided that it was necessary to see the medium at work in a naturalistic setting. By applying the framework of social semiotic ethnography in the early years classroom, both the semiotic resources on offer and the patterns of use were brought into focus (Vannini, 2007). This approach is similar

to the approach adopted in the research of Labbo (1996), which suggested that screen text-making can be constructed by children in terms of various 'worlds'. While the screen is sometimes constructed as a canvas, at other times, it is constructed as a playground, stage or landscape. This way of conceptualizing screen text-making in the classroom was essential in interpreting the findings from my own ethnographic observations, which are reported in Chapter 8.

3.5.3 Practitioners' perspectives

As discussed in the previous chapter, children's picture-making is constructed on the basis of expectations that are held by an 'interpretive community' (Fish, 1980). In the case of screen picture-making in the early years classroom, the 'interpretive community' comprises both the children and the practitioners. Within this community, various discourses exist in relation to children's picture-making, though these will be more or less dominant. Gardner (1980) suggests that two discourses are popular: the 'unfolding' discourse and the skills discourse. According to Hawkins, the 'regime of truth' (Foucault, 1972) to which most practitioners subscribe is best understood as a preoccupation with self-expression, whereby children communicate internal facets of an essential 'self' through the creation of pictures. In order to probe these and other discourses that surround young children's picture-making in the early years classroom, I decided that it was crucial to explore what practitioners had to say about screen picture-making in interviews on this topic (RQ4).

3.6 Summary

As the literature specifically relating to screen picture-making is minimal, my review began with an exploration of research on children's drawing. I considered the role of drawing in the EYFS curriculum and the different approaches that are taken by practitioners and family members towards children's drawing. The distinction between these different approaches can be understood as a difference in focus: either on process or on product. The process/product divide also relates to different traditions in the interpretation of children's picture-making by researchers. While many researchers have used picture products as projective measures, more recent approaches have prioritized contextualized process-based accounts of picture-making, so that talk as well as text is taken into account. The different ways that picture-making can be approached both in practice and research highlights the extent to which the activity is a culturally defined practice; within each culture, certain types of content and composition will be valued over others and this will influence how the activity is enacted.

The findings of a literature review on paper picture-making provide a starting point for considering how children are likely to make pictures on screen. However, in order to understand the differences that may arise between media I looked at the integration of screen media into early learning more generally and the value placed on this integration in the home and classroom. The literature on these topics can be understood better by drawing on the theoretical lens provided in the previous chapter. For example, the concept of affordances helps us to engage with literature that exists on children's use of screen media for text-making and to identify which material properties and social associations of screen media are likely to affect how children make pictures when using this medium. Conducting this review enabled me to be more specific about the research I planned to conduct into screen picture-

making and to formulate the four research questions that are the foundation of this thesis. Each of these research questions requires a particular approach to be taken towards empirical research, so I finished by briefly outlining what these were. In the following chapter, these approaches will be outlined in much greater depth and accompanied by a detailed account of the methods I employed.

Chapter 4

Methodology

4.1 Introduction

Where are the rich ethnographic studies of educational technology and media use? Where are the detailed statistical studies, randomised controlled trials or meta-analyses? Where is the methodological sophistication that our field deserves? (Selwyn & Oliver, 2011, p. 2)

The role of screen media in education is a burgeoning field of research, but as Selwyn and Oliver note above, its empirical rigour has often fallen short of the radical theoretical questions put forward. Thus, the appropriateness of the methodologies and analyses I have used is of crucial importance to my thesis and a matter of debate as well as description. The way in which I have collected and analysed data has taken inspiration from a wide range of approaches that by themselves each elucidate some, but not all, of the questions asked. A pluralistic approach to method characterizes most contemporary research in the social sciences, but without a strong understanding of the theoretical traditions associated with each approach, it risks descent into a 'free-for-all' where fundamental decisions are made without explanation. Here, I aim to demonstrate the appropriateness of mixing methodological approaches by outlining each decision I made in relation to the theories that frame the questions I have asked.

As outlined in the previous chapter, I designed my research according to four research questions:

RQ1: How is children's screen picture-making similar/different to their paper picture-making?

RQ2: What are the distinct affordances of screen picture-making?

RQ3: How is screen picture-making enacted in the early years classroom environment and what is the discourse that surrounds it?

RQ4: How do early years practitioners conceptualise screen picture-making and do they see a role for the activity in early learning?

While these questions are inter-related, they each connect with one methodological approach I used in particular. Thus, the first two questions were primarily explored through experimental comparisons; the third question was explored through naturalistic observation; and the fourth question was explored through practitioner interviews. The remainder of the chapter is organised according to these three methodological approaches. Within each section, I outline the theoretical underpinnings of the approach, the details of the procedure I employed including the participants sought and the ethical measures taken, and the type of analysis that was conducted on the data collected.

4.2 Experimental comparisons

The purpose of the experimental comparisons was to determine the similarities and differences between children's picture-making on paper and on screen. These comparisons were understood in terms of the key themes that emerged from the literature on paper picture-making: picture content, picture composition and the use of narrative as a device in picture-making. Where differences existed, the experimental comparisons provided an insight into the affordances that facilitated this difference. While certain features of the naturalistic setting for picture-making were present in these comparisons (e.g. the close relationship between picture-making and conversation), others were removed.

Children participating in these comparisons were taken out of the classroom context and made pictures individually with the researcher, rather than collaboratively with other children and with their teachers present. By controlling the observations in this manner, it was possible to conduct a narrower comparison of the picture-making media and their affordances. On the other hand, the experimental approach limited the conclusions that could be drawn from the data collected and made it necessary to take other, complementary approaches, which will be discussed in subsequent sections of this chapter.

4.2.1 Approach

In order to compare children's picture-making in two media, it was necessary for me to control certain variables that arise in the naturalistic context of the classroom. As a result, I designed a picture-making task for two groups of participants that differed only in the medium used. In order to make these comparisons as focused as possible, the children completed the task in a space outside of their classroom, working in a quiet area in which only they and the researcher were present. Furthermore, the time that they spent on the task was to some extent limited. As a result of these aspects of the design, I refer to these comparisons as 'experimental'. Having said this, it is essential to note that the children's completion of the task did not take place in a laboratory setting. The space in which the task was completed was connected to their classroom, and I, as a figure who had visited their classroom previously, was an adult associated with their school life and was framed, at least to some extent, as a practitioner. Furthermore, the task occurred amidst surrounding talk that was uncontrolled. Thus, although variables of the task were controlled (instructions, materials etc.), I embarked on a unique conversation with each child and these conversations inevitably influenced the process of their picture-making.

Given these features of the research design, I would position myself as a co-participant in the task, and would argue that the design is best thought of as a type of overt participant observation.

The key characteristics of participant observation are an involvement of the researcher in the life and practices of the group being studied (Jorgensen, 1989). Its origins within anthropology mean that in its traditional form, participant observation occurs over an extended period of time, but in its development as a method within other disciplines, such as sociology and social psychology, this aspect has been seen as less essential (Delamont, 2004). In the research design described here, my involvement in the task of text-making cannot be ignored. Although the same prompt questions were used working with each child, there was a distinct flow of conversation between each participant and me. This was the result of both the child's expectations of working with an adult on a task (that this was a co-creative pursuit to be mediated by communication) and the respect I wished to demonstrate for the rich contextual information that was provided by their talk (Frisch, 2006; Cox, 2005).

While my status as another participant in the task seems unquestionable; more problematic is whether I was observing the everyday practices of the children being studied, rather than a specific set of responses to researcher-imposed task instructions. Setting up a task in order to generate semiotic practices and artefacts could be seen as 'unnatural', but given the prevalence of similar text-making opportunities within the child's life and their familiarity with working one-to-one with adults in order to co-create texts, there was also great similarity between this task and tasks undertaken by the child as part of the everyday realities of schooling. Cameron (2001), making sense of the term 'discourse', points out that observed speech can never be thought of as natural or pure:

If you accept that all talk is shaped by its context, then arguably it does not make sense to take on context as more 'basic' than another. (Cameron, 2001, p. 21).

If we apply this line of reasoning beyond talk to include all meaning-making, it is clear that the 'practices of the group under study' is a more elusive and elastic concept than it may at first seem.

Within this research approach, talk was prioritized to the same extent as text-making. The talk of the children was analysed as a vital source of information about both the content included in their pictures, and the affordances of the media that constrained or facilitated this content. Of course, children chose to communicate through talk to varying degrees. I was accepting of these individual differences and sought to ensure that all of my responses were sensitive. No child was asked to make a text when they expressed an unwillingness to do so; similarly, if they expressed a wish to remain silent as they made the text, this was respected.

Through overt participant observation centred on co-creative experiences of text-making, I used guided participation and intersubjectivity as the key tenets in this relationship (Rogoff, 1990; Rogoff et al., 1993). These concepts have been used to understand learning from a Vygotskyian perspective, but they can also form the basis of a practical approach to research with children: the researcher is not there to subject child participants to an entirely novel experience, but instead, like a teacher or family member, the researcher facilitates the child through talk and non-verbal cues to make sense of a new situation and observes how this process unfolds.

The children in this study sometimes indicated that they wanted to know more about the research situation. For example, some of the children noticed the presence of an audio recorder on the table and wanted to

know what it was and whether they could try to use it. Rather than dismiss this as irrelevant to the research procedure, I tried to incorporate this learning opportunity after they had finished making their text. Given our presence within an educational setting, this approach was appropriate in a way that ignoring a child's curiosity would not have been. By discussing aspects of the research they were participating in, the child's opportunities to provide meaningful verbal consent or withdrawal were also increased, since it was parents, rather than children that provided initial written consent (David et al., 2001).

A final issue relating to the conceptualization of the child participant was the treatment of the finished texts that they had created either on paper or on the computer. Cox (2005) in her contextualised study of children's drawing, did not feel that it was necessary to take any examples of the children's drawings away with her, and to some extent, she felt that this would be an intrusion upon the typical wishes of the child to keep the drawing they had made. The nature of my research demanded that I store a complete record of the texts that children made using different media; at the same time, I had no wish to dismiss the desire of the child to take with them an artefact into which they had invested time and effort. At the end of the text-making episode, I therefore explained to each child that as long as they were happy for me to do so, I would take away the picture they had made in order to make a copy so that I could keep one and they could keep one; I explained that this would take a few days as I needed to take it to a special place in order to make the copy. I then sent to the teacher a collection of colour copies of the children's work from the research sessions, along with a certificate thanking each child for their participation in the study.

4.2.2 Participants

In order to conduct the experimental comparisons of picture-making on paper and on screen, two groups of 4-5 year old participants were recruited with 18 participants in each group. Participants were recruited through three state-funded schools in the area of East Oxford. Schools were chosen because they were local to the university, and all who agreed to participate were included in the study. Headteachers were contacted regarding participation in the research, and once they had agreed to participate on behalf of the school, consent for individual children in the reception year was sought via their parents or guardians. Two of the schools recruited are dedicated to foundation stage provision (preschool and reception years) and offer places to children living nearby. The third school is a Catholic primary school with a reception year. The children attending these schools differ in terms of their home background and experiences, but for each school, there is a high degree of diversity amongst the children attending in terms of cultural background and socio-economic status.

The participants were unevenly distributed across school (table 4.1). This was dependent upon the rate of parental consent obtained in each school. The extent to which parental consent was obtained for each school was a relatively strong indicator of the affluence of the community served by the school. Thus, the school in which a majority of parental consent forms were returned (School 3 in the table) serves an affluent community, mostly comprising professional parents for whom English is a first language. On the other hand, the schools in which a smaller ratio of parental consent forms was returned (Schools 2 and 3 in the table) serve a poorer community with a greater rate of linguistic and ethnic diversity. I was concerned about the representativeness of my sample, and strived to collect consent from as diverse a range of

children as possible. Although the numbers reported here demonstrate that this was not fully achieved, the sample was far from homogeneous.

Table 4.1 The distribution of participants across gender and setting

	Boys	Girls	Total
School 1	5	5	10
School 2	3	5	8
School 3	12	6	18
Total	20	16	36

The schools included in the study each take a distinct approach to education in the early years. Having said this, there are similarities between the practitioners' views in each school, and all three schools follow the early years foundation stage (EYFS) guidelines as they have been set out by Government. At the time of the study (October 2011 to February 2012), the EYFS framework comprised 69 early learning goals in communication, physical activity and personal development. All of the classrooms involved in the study approached these goals through a combination of structured input ('carpet time') and free-flow activity time. However, different schools emphasized these aspects to different extents. Schools 2 and 3 sought to minimize structured input and maximize child-led activities. School 1 took a more structured approach, and more time was dedicated to whole-class teaching. These choices are likely to relate to the context of each school. Thus, the more structured system in School 1 may be explained by the prospect of Year 1 being physically present in the classroom next door. On the other hand, Schools 2 and 3, as foundation stage schools, may see

early learning as more of a project in its own right with values separate from the rest of the education system.

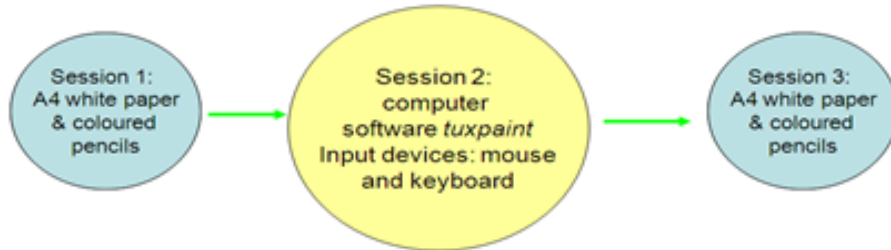
4.2.3 Procedure

Once participants had been recruited through the three schools, they were allocated to Groups 1 or 2 alternately, so that conditions were, as far as possible, spread evenly across the different settings wishing to take part in the research. This is important as comparisons between media may otherwise have been skewed by the approach of different settings to the inclusion of screen text-making in the classroom.

During the sessions of contact with me, children were removed from the main space of the classroom to a quieter area. They made pictures sitting down at a table on which picture-making materials were placed and I sat beside them. The nature of the physical place in which the research was conducted depended on constraints within the school. In some schools, a room was available in which a small group of children were playing with a teaching assistant, while in other schools, an infrequently used corridor or a library in use by other students was the space available. Removing each participant from the main classroom space enabled them to focus on the task of creating a picture. The type of space to which they were removed did not appear to influence the outcome of the task – children across the schools engaged in a similar manner with the activity.

Figure 4.1 Experimental comparisons procedure

Group 1:



Group 2:



The participation of both groups was organized according to the same structure of sessions, but while Group 1 completed an episode of picture-making on the computer, pictures among Group 2 were made only with more ‘traditional’ materials, such as paper and pencils (figure 4.1).

Session 1: Groups 1 and 2

During the first session, both groups made a picture using plain white A4 paper and coloured pencils. One of the aims of this session was to establish a rapport with the participants; another aim was to gain as advanced an understanding as possible of each child’s picture-making tendencies, without yet involving the influence of different media. The

children were encouraged to make a picture on the plain white paper via questions I asked at different points during the picture-making:

What's your favourite thing to do at school?

Would you like to make a picture about that?

Would you like to add any writing to your picture?

Would you like to add anything else or are you all finished?

Can you tell me about your picture?

The session came to an end when the child indicated that the picture was complete either through a verbal cue (e.g. 'I'm finished') or physical signal (e.g. putting the pencil down). Thus, the timing of the session varied between children but was always between five and twenty minutes. The time taken by an individual child over their initial drawing was one idiosyncrasy of many that became visible through participation in the first session. This session therefore enabled a clearer comparison of group or individual differences that arose in the second session, when the medium of picture-making was varied. I could first check whether group differences could be accounted for by individual differences rather than appealing immediately to the influence of medium as an explanation. I also used findings from the first session in conjunction with the literature to establish analytical categories that could be used in interpreting the data from the second episode. These categories are central in Chapters 5, 6 and 7. Finally, this session allowed me to establish a rapport with the children and this enabled the second session to be less direct in terms of instructions.

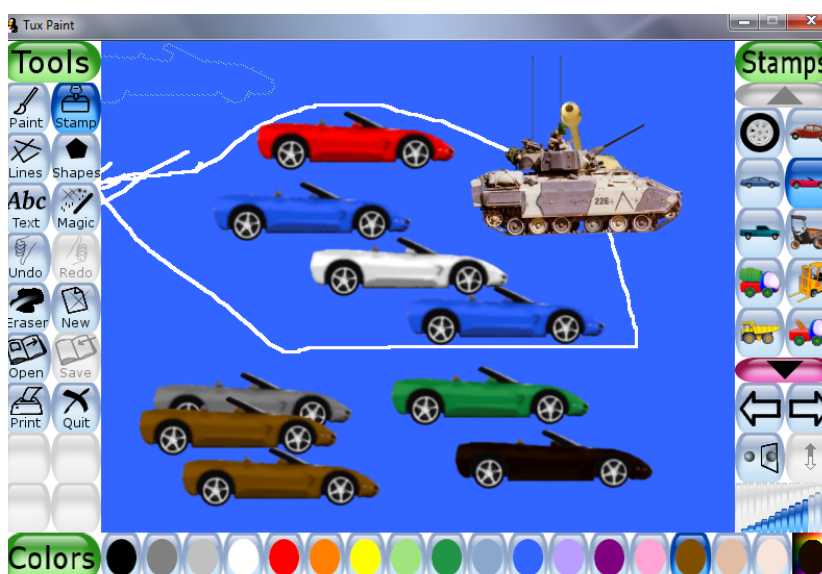
Session 2: Group 1

It was in the second episode that the groups' experiences differed. The second session took place between one and five days after the first

session. I considered this length of time between sessions to be suitable because children would remember me from the first session, while still seeing the second session as a distinct activity. The variation in the time between sessions depended on practicalities of timetabling for the school, but this did not seem to impact upon how children engaged with the second session of picture-making.

For Group 1, text-making occurred on the laptop using a mouse, keyboard and the text-making software *tuxpaint* which is designed for children aged three to twelve (see figure 4.2).

Figure 4.2 A *tuxpaint* screenshot



The software includes a range of picture-making tools. Most of the children participating in the study were unfamiliar with *tuxpaint*. The practitioners in the schools had not seen *tuxpaint* used in an early years educational setting. I made the choice to use *tuxpaint* because, according to its designers⁶, it was suitable for the age group and contained the material features that I was interested in exploring the

⁶ <http://tuxpaint.org>

influence of e.g. ready-made images via the 'stamp' tool and the quick removal of visual material through the 'eraser' tool. Although *tuxpaint* has built-in sound effects, I turned these off when working with the children. The influence of such sound effects on the semiotic practices of the children would be fascinating to investigate, but I wanted to avoid complicating the comparisons between media with the presence of stimuli in other modes.

In order to ensure that all children felt comfortable with this medium, I guided children through an interactive demonstration of *tuxpaint* following a set procedure: choosing a background colour, using the 'paint' tool (including painting with different colours), using the 'stamp' tool, writing using the keyboard and erasing the picture. All of the children were engaged during this interactive demonstration, and they all took the lead in producing visual material on screen. Each child was then asked:

Do you want to have a go at doing a picture by yourself?

What would you like to make a picture about today?

Because of the potential unfamiliarity of the medium, there was more guidance and interaction in relation to the tools available than was applicable in the first session. For example, if a child had used only one of the tools available after ten minutes of text-making on the computer, they were gently asked by me if they would like to try using one of the other tools and these were physically pointed out on the screen. In order to prevent this from being understood by the child as a demand I was issuing (thereby influencing the way that pictures were made in this medium), I presented options as binaries: e.g. 'Would you like to try one of the other tools or are you happy to carry on using the paintbrush?'. I asked equivalent questions when pictures were made on paper during the second session.

Ideally, as in the first session, this session finished when the participant indicated that their picture was complete. However, the novelty of the computer and the ease with which pictures can be erased and begun again, meant that this was not always practical. After twenty minutes of picture-making, children were therefore told that they had two minutes left so that they should add anything they really wanted to add in that time. The child would then typically end the session themselves within the next two minutes; if this did not happen, I would find an appropriate opportunity to suggest that together we click on the 'save' button to keep safe the text that the child had made and the computer was removed.

Session 2: Group 2

For Group 2, the picture in the second episode was made using coloured A4 paper, coloured pencils, felt-tip pens and stickers. The aim in designing the second session for this group was to minimise the group differences in experience as much as possible except in relation to the medium being used. Therefore, the second session for Group 2 also took place between one and five days after the first session, and lasted for a maximum of 20-25 minutes, with a warning at twenty minutes that there were only two minutes left.

It was also important to create a situation in which there was some change from the first session in terms of medium, and that the new media available were more novel, and likely to be an object of greater interaction between myself and the children. Children in this group were first introduced to the materials available, but they were not demonstrated because children were largely familiar with these materials through their prevalence in the classroom. The exception to this was stickers, which while generally familiar to children, are not used as part of picture-making in mainstream settings: the peeling of the

stickers from their backing was therefore demonstrated before picture-making began. Because of the difficulty of this procedure, children were more likely to ask for guidance and help than when drawing with pencils or felt-tip pens. The use of stickers was particularly important for conducting comparisons with the *tuxpaint* software as the application of ready-made images is given equal visual weight within the *tuxpaint* screen as painting, writing and erasure. Using images was a source of great excitement for the children using the computer, and a key part of their picture-making on screen. Rather than attribute this directly to the medium, the availability of stickers in the paper condition made it possible to determine whether any differences of this nature arose as a result of possibilities within the media, or instead as a result of the perceptions of use associated with each medium. Another difference between the media available in the first and second sessions for Group 2 was the use of coloured paper in the second session: the opportunity to choose a colour at the beginning of the session mirrored the experience of Group 1 in identifying a background colour for their picture on the screen.

Session 3

For both groups, immediately after the completion of the second session, children completed the third and final session in their participation. The final session was originally included in the research design in order to identify any group differences in the overall trajectory of picture-making as a result of experiences within different media. For example, I wanted to determine whether the use of ready-made images in *tuxpaint* by Group 1 participants changed the objects that they chose to represent in the picture of the final session, though they were once again using only plain white A4 paper and coloured pencils. However, as a result of the amount of time the children had committed by this

point to working with me, the third picture became in practice a 'quick drawing' that relied heavily on schematic representations that the child was familiar with. This approach was taken by all children in the study, regardless of the group to which they belonged. I therefore decided that the third session would not be part of my analysis of experimental comparisons between paper and screen picture-making.

4.2.4 Analysis

In the analysis I was looking for evidence to answer the following research questions:

RQ1: How is children's screen picture-making similar/different to their paper picture-making?

RQ2: What are the distinct affordances of screen picture-making?

These questions were approached in relation to three themes: content, composition and narrative and through an analysis of both talk and text. In the following sections, approaches to the analysis of talk and then text are considered, before I explain how I applied them to picture content, composition and narrative.

4.2.4.1 Talk Analysis

At the age of 4-5 years, children talk in different ways. They talk in order to interact with others by taking part in conversations, and they may also talk in order to direct their thinking and activity (Dyson, 1986, refers to this as 'directive talk'). While there are various approaches to the analysis of participants' talk, there is no singular type of analysis designed to deal with children's talk as it switches between

interactional, directive and text-related. My research questions were primarily concerned with talk as a vehicle of information about lived experience. As a result, various forms of discourse analysis were inappropriate for the task, since they require the language itself to be the focus of the analysis (Cameron, 2001). The research of Mercer (2008) and Dyson (1986) particularly influenced the analytical process I developed in order to make sense of the talk data I collected, so that the focus was on what was said, rather than on how it was said.

In order to compare the talk relating to pictures between groups, it was necessary to identify relevant talk. After talk was transcribed, talk relating to the picture-making was fragmented from other types of talk (e.g. making sense of wider life events, or making sense of the current situation). In Barthes' (1978) *A Lovers' Discourse*, fragments are structural elements (e.g. moods, emotions, gestures, tones of voice), which come together collectively to form the discourse. Here, fragments are understood as utterances that are relevant for the analytical task at hand and their boundaries arise from specific discourse makers – most typically a prolonged silence or a switch in turn-taking in the conversation.

Transcript Extract (Participant 7)	Fragments
<p><i>Do you want to tell me what you're drawing as you draw it? Who's that?</i></p> <p>Ife.</p> <p><i>Is that your friend?</i></p> <p>Yeah.</p> <p><i>Do you play together?</i></p> <p>Yeah.</p>	<p>Ife. (fragment 1)</p>

<p>...</p> <p>I'll do a boy. I'll try blue. I'll start with blue, with one head, for a boy... I got it wrong. I'll just turn it over...</p> <p><i>What was wrong with that?</i></p> <p>I can't draw a boy.</p>	<p>I'll do a boy. I'll try blue. I'll start with blue, with one head, for a boy... I got it wrong. I'll just turn it over... (fragment 2)</p> <p>I can't draw a boy. (fragment 3)</p>
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Once fragmented in this way, I organised talk through categorisation in relation to content and narrative while composition was explored primarily through the pictures themselves. Categories were constructed using concepts in the literature and inductively via the analysis of fragments from the first session. I discuss this process in more detail in the sections below on content and narrative.

4.2.4.2 Text Analysis

As well as using talk in the analysis of text-making, I analysed the texts themselves. Visual images as sources in qualitative social sciences research have increasingly been the subject of discussion and scrutiny over the last 20 years (e.g. Prosser, 2012; Rose, 2011). Despite this growing interest, researchers' interpretation of images, including children's pictures, have most often relied on accompanying discourse in the form of talk or written texts. There is a:

general mistrust in the social sciences in researchers' competence in interpreting images that they have not themselves taken or created. (Freeman & Mathison, 2009, p. 128).

I would argue that the tentative approach of social researchers towards the analysis of visual texts is partly the result of previous research

programmes in which children's drawings have been used in constrained ways to measure cognitive or emotional traits, with little attention paid to the reliability of such projective measures. Children are individual in the way that they choose to use images to think and communicate about the world around them; they 'use representation... in creative, playful or abstract ways' (Freeman & Mathison, 2009, p. 113). Semiotic analysts have however, over the last twenty years, attempted to generate a 'grammar' of the visual (e.g. Kress & van Leeuwen, 1996; Kress & van Leeuwen, 2002; Stebbing, 2004) that enables researchers to focus on particular aspects of images and understand them as meaningful choices on the part of the maker. It is this framework that I will apply in my analysis of the children's pictures in a hope to go beyond using them merely as complementary illustrations for the talk analysis, and instead understanding them on their own terms. The nature of this framework has been inspired by linguistic analysis but also deviates considerably as a result of the fundamental differences between language and visual material: 'statements cannot be translated into images' and 'pictures cannot assert' (Gombrich, 1982, p. 138, p. 175). I refer regularly to texts in my analyses of content and narrative, but it is in my analysis of composition that I rely most heavily on the visual.

4.2.4.3 Content

I categorised fragments of talk according to the picture content to which they related. Analytical categories were developed in order to compare content between paper and screen in the second session of picture-making, as demonstrated through both talk and text. Three categories were established with reference to the literature (e.g. Malchiodi, 1998; Cox, 2005; Anning, 2003): *people*, *place* and *action*. In order to check the validity of these analytical categories, I used them to conduct an

analysis of the paper pictures created by all 36 children in the first session of picture-making (this process is described in more detail in Chapter 5). I then adopted these categories for the analysis of the pictures from the second session, but added two more categories that I felt would be important: *experimentation* and *image use*. While these have not been explicitly investigated in previous research on children's picture-making, I decided that they would be important given my interest in the medium itself and comparing different media. These categories led to interesting additional comparisons and so were included in the final analysis.

4.2.4.4 Composition

In understanding picture composition, I prioritised the visual text. Analytical categories were developed in order to compare composition between paper and screen in the second session of picture-making. These categories were established with reference to the literature (e.g. Winner & Gardner, 1981; Golomb and Farmer, 1983). I decided to look at *colour range*, *colour choice*, *balanced composition*, *spatial arrangement*, *object relations* and *image use*. In order to have a clearer idea of the differences I would be looking for within these categories, I applied them to the analysis of the paper pictures created by all 36 children in the first session of picture-making. This helped to clarify what dimensions of difference I would focus on when analysing pictures from the second session. For example, I was aware that colour choice would subdivide into pictures that used colours in a 'realistic' way, pictures that used colours purposefully but subjectively, and those that clearly prioritised form over colour choice, which appeared to be arbitrary.

4.2.4.5 Narrative

While the analysis of content and composition was based on the text and talk of all participants, narrative picture-making related to a subset of participants – those who produced narrative talk to accompany their picture-making. As Rudrum (2005) notes, the definition of narrative is itself problematic, with some narratologists arguing that only a single event is necessary for the presence of narrative, while others state that a sequence of causally-related events is required. In order to remain open to the presence of narrative, I took the most flexible definition of narrative available: ‘the representation of at least one event’ (Prince, 1999, p. 43). Using this, I developed three questions that could be asked of participants’ talk in order to determine whether an event was occurring in the picture that they created (see questions 1 to 3 in table 4.2). The research of Nicolopoulou (2008) has highlighted the need to extend conceptualisations of narrative to include facets other than plot, such as character and setting. In order to recognise the importance of these narrative dimensions, a final question was developed that explicitly responded to them. I took a positive response to any of the questions in the table below as an indicator of the presence of narrative.

Table 4.2 Identifying narrative

Question	Examples from the data
1. Does the talk suggest that an element in the picture is in flux rather than stasis?	<i>I’m picking up the hose.</i>

<p>2. Does it suggest imminent change?</p>	<p><i>She's about... she's trying to get me... (inaudible)... but she's about to be scared...</i></p>
<p>3. Are past, present or future states clearly referred to?</p>	<p><i>Now, the car didn't see where he's going. He was bumping up to this place and then he crashed into this room and then the car falled down of the room. When he was driving on the roof there was a triangle on there... and he pulled up and up and up... then he fell down.</i></p>
<p>4. Does it draw on typical narrative conventions like character or setting?</p>	<p><i>This is Optimus Prime.</i></p>

Once narrative talk fragments were identified, analytical categories were developed in order to compare narrative between paper and screen in the second session of picture-making. These categories were established with reference to the literature (e.g. Preece, 1987; Nicolopoulou & Richner, 2007). I decided to look at *narrative type*, *characterisation* and *scene setting*. In order to check the validity of these analytical categories and to understand them better, I used them to conduct an analysis of the paper pictures created by all 36 children in the first session of picture-making (this process is described in more detail in Chapter 6). I then adopted these categories for the analysis of the pictures made in the second session. Individual examples were

explored as case studies in order to provide in-depth insights into the relationship between narrative text-making and the medium used. While the visual texts were not used to identify or categorise the presence of narrative, they did play a role in the case study interpretations.

4.3 Social semiotic ethnography

I wished to know how the practices of screen picture-making were enacted in the naturalistic context of the early years classroom. I wanted to see in action the influence that peers' and practitioners' conceptualizations of screen picture-making would have on the way children constructed this activity in the classroom; and how certain affordances were 'semiotized' (Bjorkvall & Engblom, 2010) in the naturalistic context. In order to do this, it was necessary to see the technology at work in an early years classroom. I used social semiotic ethnography in order to explore how screen picture-making is enacted and constructed in the classroom context. The following sections provide an overview of the approach I took, the procedure I used and the analysis I employed.

4.3.1 Approach

Social semiotic ethnographers take a dual focus, looking at both the semiotic resources available for meaning-making and the everyday use of these resources. This enables the researcher to understand how different affordances associated with a set of resources are prioritized or 'semiotized' in naturalistic contexts (Bjorkvall & Engblom, 2010). Vannini (2007, p. 125) describes social semiotic ethnography as:

the study of lived experience of meaning and with the actual, practical use of semiotic resources. Whether sociosemiotic

ethnographers are interested in understanding, collecting, documenting, cataloguing old or new semiotic resources they must remain focused on how actual social agents, individually or in groups, produce, create, distribute, exchange, use, consume, or interpret semiotic resources . . .

Ethnography more generally can be understood as the writing of a culture, whereby researchers use observation to understand and interpret cultural practices and phenomena. Ethnographers document behaviours but strive to construct 'thick descriptions' (Geertz, 1973) by engaging with the value systems that underpin these behaviours. When the focus is on semiotic resources, both the use of these resources and the personal and social constructs guiding use are of interest.

Ethnography can act as a fully-fledged theoretical and methodological framework, or as a single method to complement others. Lillis (2008) makes the distinction between ethnography as method, methodology and as 'deep theorizing'. Although she applies these distinctions to the field of academic writing research, they are applicable to research into text-making more generally. Lillis outlines ethnography as method as the collection of 'talk around text' (p. 355). This is akin to the contextualised approaches of Cox (2005) and Frisch (2006), where children's talk is seen as essential in understanding the texts they make. In order for ethnography to be not just a method but a methodology, Lillis argues that there must be use of 'multiple data sources and sustained involvement in contexts of production' (p. 355). Finally, ethnography as 'deep theorizing' only exists if there is an attempt to challenge the theoretical distinction between text and context through the methods employed.

With these distinctions in mind, I would suggest that my approach was one of ethnography as method and to some extent methodology. I was certainly interested in the talk that surrounded text-making: as with the experimental comparisons, this was a primary focus in the analysis of

the naturalistic observation data. However, the ethnography was further developed by combining a focus on talk with other forms of data collection and by conducting the observations over the course of four days. For example, I analysed the pictures that were saved by the children onto the computer and kept field notes that enriched my analysis of the audio recordings. Furthermore, I collected interview data with the practitioners present in the classroom (to be discussed in the next section).

Making sense of the range of data collected during ethnography requires that the researcher relies heavily 'on the social and interpretive skill of the human observer and on the vernacular methods of enquiry' (Walker, 2012, p. 77). Foregrounding particular sources or examples of data depends on the narrative links that a researcher chooses to forge. Because of the multiplicity of data and the subsequent narrative choices that must be made, the researcher must demonstrate 'constant attention to self-reflection, self-critique and concurrent active reading to keep the study intellectually mobile and sharp' (p. 78). I understood self-reflection as an active pursuit within this approach to data collection and analysis. I aided my reflective process by keeping a diary of the choices I made both when gathering data and in interpreting it.

Another issue in conducting ethnography is that of power in the human relationships that are created in 'the field'. In attempting to represent the everyday realities of a community, there are dimensions of power that need to be made explicit (Bhatti, 2012). It was necessary to consider myself in relation to the individuals involved in the study, and to explore their perceptions of me. These interactions and a more in-depth account of the setting in which this study was conducted are provided in the following section. However, it is appropriate to explain here that my presence was unobtrusive. I sought to intervene as little as possible with the site of my study. It was necessary however, for me to be

present in the classroom in order to help with any practical difficulties that might have occurred. Thus, I was a participant in the wider field of study, but unobtrusive within the particular site of interest. This duality enabled me to establish an insider's perspective on the classroom culture, while still capturing as naturalistic a portrait as possible of the use of the semiotic resources in which I was interested.

4.3.2 Participants

The reception class (4-5 year olds) of a foundation stage school was recruited. The school was previously identified as School 3 in the experimental comparisons. Of the three schools in the first study, it was the school from which I recruited the most participants for the first study. Following on from the experimental comparisons, I had engaged in 'longer conversations' (Lillis, 2008) with both the school's headteacher and the reception class teacher. These conversations enabled me to set up the ethnographic observation study.

For this study, all parents/carers of the children in the class to be observed were fully informed of the study through a letter and information sheet. They were given three weeks to ask questions and raise any concerns they had. If they decided that they would prefer for their child not to participate, they had the opportunity to communicate this orally to me or any practitioner in the setting or via a written withdrawal-of-consent form. Had this been the case for any of the children in the class, data collected relating to them (e.g. their screen activity) would have been excluded from the analysis and disposed of as soon as possible. However, no parents/carers raised concerns about the study and the participation of their children. As a result, I obtained 100% participation for the class, and was able to analyse and interpret all of the data collected.

4.3.3 Procedure

For four days (Monday to Thursday), during the afternoon session of free-flow activity time (1.30-2.30pm), a computer was placed in the classroom. The computer had the developmentally appropriate picture-making software *tuxpaint* installed, which was also used in the first study. This continuity enabled me to determine the distinct affordances of screen picture-making across experimental and naturalistic contexts. The programme *tuxpaint* was the only software accessible via the desktop icons on the computer. The use of *tuxpaint* on this computer was an activity that children could choose to engage with by themselves or with other children. During the time that the computer was active in the classroom, audio recording equipment was placed beside the computer in order to capture the surrounding talk of the children as they made pictures on screen.

The children were briefly introduced to this new option for activity at the beginning of the week by the practitioners in the setting. I was present in the classroom during the time that the computer was available to the children in order to solve any technical problems that arose. However, I was not involved in the children's use of the software beyond this and they were free to make use of the programme in whichever way they preferred. For the vast majority of the time, I engaged in different activities in the classroom, away from the site of interest, so that the children did not 'perform' to me when using the computer. If a dispute between children arose over access to the computer, this was mediated by practitioners in the classroom in the way that they would normally resolve conflicts over the distribution of resources. Prior to the research being conducted, I had conversations with the main practitioner in the classroom and explained that I could not be too heavily involved in monitoring use of the computer as this would skew findings from the

study. This was then explained to other practitioners, such as teaching assistants, in the classroom.

4.3.4 Analysis

In the analysis of the social semiotic ethnography, I was aiming to answer the following research question:

RQ3: How is screen picture-making enacted in the early years classroom environment and what is the discourse that surrounds it?

Since my focus was on the construction of a semiotic practice, the primary analysis concentrated on examples of interaction that were recorded around the use of the computer for screen picture-making. This included interactions between peers, between practitioners, or between children and practitioners. In order to understand these interactions, I explored the talk that was used by those involved in the interaction. Therefore, the first step in my analysis was the transcription of four hours of potential interaction that this study recorded. The transcriptions were talk-focused since they were based on an audio recording in order to capture data. However, where other forms of communication that played a part in the interaction were identifiable and significant, they were also recorded in the transcript. Of the interaction transcripts, I focused on those that suggested the co-construction of the activity. The latter was signalled through the presence of discussions, disagreements and demonstrations relating to use. These interactions were identified for further exploration; they were understood as 'key moments' in the co-construction of discourse in the free-flowing environment (Wang & Carter-Ching, 2003).

I supported my analysis of the key moments of interaction through the pictures that had been saved onto the computer over the course of the four days. Initially, I had wanted to collect recordings of these texts being made through the screen capture software *Camastasia*. On further investigation however, the data files that would have been created through the use of this software were too large and I had to resort to only collecting the pictures that were saved on the computer. Despite this constraint, these texts still offered a better understanding of how children constructed the activity in screen picture-making in different ways and how they were influenced by interactions with each other and with the practitioners in the classroom. I used Labbo's (1996) groundbreaking 'worlds' model of screen text-making as a starting point for the interpretation of all the data that I collected in this study. Labbo's model suggests that children construct screen and text-making in different ways: the screen as stage, as playground, as landscape and as canvas. My data lent support to this model, but also enriched it by suggesting additional 'worlds' of the screen, the existence of tensions between these 'worlds', and by outlining the longer-term practices that support or hinder the development of specific 'worlds'. These issues are considered in more depth in Chapter 8.

4.4 Practitioner Interviews

As discussed in the literature review, children's picture-making practices are influenced by the expectations held by the 'interpretative community' (Fish, 1980) that surrounds them. In the context of formal education, this community is the class and comprises both peers and practitioners. Labbo's (1996) research on screen text-making suggested that the expectations of the adults in the classroom are essential in the practices that children develop. To understand the present and future practices of screen picture-making in the classroom,

I therefore needed to access practitioners' conceptualisations of the activity and their understanding of its role in the context of the early years classroom. In order to do this, I conducted semi-structured interviews with practitioners about screen picture-making using examples of screen pictures that had been made by children in their school. Through the analysis of these interviews, I sought to answer the following question:

RQ4: How do early years practitioners conceptualise screen picture-making and do they see a role for the activity in early learning?

4.4.1 Approach

Interviews were used as a means of accessing practitioners' conceptualizations of screen picture-making and its role within early learning. Since the aim of the interviews centred on the complex psychological notion of conceptualizations, it was decided that semi-structured interviews would be appropriate. Semi-structured interviews are an opportunity for researchers to explore the knowledge, understanding and perceptions that individuals harbour and the distinct form that these facets take in different individuals. Mears (2012) describes in-depth interviews as:

Purposeful interactions in which an investigator attempts to learn what another person knows about a topic, to discover and record what that person has experienced, what he or she thinks and feels about it, and what significance or meaning it might have' (p. 170).

This definition is appropriate in this context since the focus was on each interviewee's perspective, rather than pre-ordained categories of experience that I had imposed. Practitioners were not simply positioned

as either 'negative' or 'positive' towards the activity of screen picture-making; open-ended questions allowed for the nuances of their opinions to be shared. Such an approach 'lets the participant decide what seems most important and worthy of sharing' (Mears, 2012, p. 173).

I chose to prioritise depth over breadth in conducting interviews, and so selected the practitioners that represented 'information-rich cases' (Patton, 2002, p. 230). All those involved were practitioners that had been present in the school while the experimental comparisons of the first study were being conducted, and had an interest in the data that had been collected during this study. As a result of this, they were involved in what Lillis (2008) calls a 'longer conversation' between participant and researcher. Thus, although the interviews themselves were relatively short, I was familiar to the interviewee and had sought informally the insights of the interviewee on prior occasions. As a result, there was a level of trust between us and this helped to achieve the necessary depth of response. Beyond the interview, the 'longer conversation' was continued through narrator checks, in which interviewees were presented with a summary of the interview and were asked to confirm that the summary was a fair representation of their participation.

In seeking to understand the way that practitioners conceptualise screen picture-making, it was not possible to ask this as a direct question in the interviews. The terminology may have been unfamiliar to the interviewees, and conceptualisations comprise a variety of aspects – opinions, perceptions, judgments, experiences, understanding, knowledge, questions etc. – that need to be separated and approached individually. The interview schedule was designed with this complexity in mind. One way to prompt talk that related to conceptualisations without leading responses was to present interviewees with the

examples of screen picture-making that had been created by children in their school as part of the participation in the first study. The use of visual material to elicit talk has been recognised as a powerful tool in interview methodology - one which helps to make interviewees feel comfortable and to articulate their experiences more fully (Hurworth, 2012).

4.4.2 Participants

Six practitioners, aged between 21 and 60, were recruited to participate in the semi-structured interviews about young children's screen picture-making. I recruited two practitioners from each of the schools involved in the experimental comparisons of the first study. Four of these practitioners were teachers who had been present in the classrooms from which I recruited the participants for the first study. The remaining two were head teachers in the foundation stage schools that had participated. Although the latter did not have a classroom role, they were present in the classrooms in their schools on a daily basis due to the small size of the schools and the hands-on approach they applied to their work. Thus, all interviewees were knowledgeable about children's everyday experiences within the school and to some extent, the home. They were in a position to comment extensively on children's text-making practices and the role that screen picture-making might have in their early learning. In the cases where practitioners were not head teachers, the head teachers of these schools were first approached to ensure that the schools were happy for the interviews to be conducted.

4.4.3 Procedure

Interviews were conducted on an individual basis and took thirty minutes. Although the interview involved open questions that facilitated discussion, there were some key topics that the interviewer sought to focus on during the limited amount of time available. In order to orient the interview and create a comfortable atmosphere, the researcher began by briefly describing the overarching aims of the research and the part that practitioners' insights would have in fulfilling these aims. The interviewees were then shown *tuxpaint* – the software that children had used to create screen pictures – in the first study. Looking at the software at this point in the interview ensured that interviewees were familiar with the notion of 'screen picture-making' and had a physical object in which to ground their points and opinions. Following this, questioning was organized around two central points:

1. How would you expect the experience of picture-making for young children to be different when they use the computer as opposed to paper?
 - *Would you expect them to create pictures about different things?*
 - *Would you expect the pictures to look different?*
 - *Would you expect them to talk in different ways as they make the picture?*
2. What role do you think screen picture-making has in the early years classroom?
 - *What positive experiences can it offer in a child's learning?*
 - *Do you think there are negative consequences of screen picture-making?*

- *What place does screen picture-making have in your classroom currently?*
- *Do you have plans for implementing screen picture-making in your classroom?*

Discussion around these questions lasted for 10-20 minutes. When a natural break in the interview occurred, the interviewee was introduced to examples of screen pictures that had been created by children in their school during their participation in the first study. Practitioners were shown all of the examples that met these criteria; thus, there was a discrepancy in the number of examples available in the different interviews. In School 1, there were six examples available; in School 2, there were three examples available; and in School 3, there were nine examples available. It was preferable to show all of the available examples because, as part of the 'longer conversation' described by Lillis (2008), it was part of establishing a sustained connection between the research and the participant. By looking at examples which had emerged from their particular school, the practitioners were encouraged to embed their responses to the interview questions within the context that was most relevant and immediate to them. This helped to draw out responses that related to 'real life' rather than general abstractions.

After the practitioners had an opportunity to look through the examples available, the questioning continued:

- *Are the pictures different to paper pictures in the way that you imagined?*
- *What positive and negative aspects can you see 'at work' in these examples?*
- *Do any of the examples change the way you think about screen picture-making?*

At the end of the interviews, the participants were thanked and given the opportunity to ask any questions of their own. As soon as possible after the interview, the interviewees were sent a summary of the discussion. They were asked whether they accepted the summary as a fair representation of what had been covered, and whether there was anything they wanted to add. All of the participants confirmed that the summaries were a fair representation of the discussion and their part within it.

4.4.4 Analysis

In the analysis of the practitioner interviews, I aimed to answer the following research question:

RQ4: How do early years practitioners conceptualise screen picture-making and do they see a role for the activity in early learning?

In order to conduct this analysis, I focused on talk that was representative of the conceptualisations of screen picture-making that the practitioners possessed. The first step in analysis was the transcription of the interviews. Following transcription, I began analysis with the first interview that had been conducted. I read through the transcript twice before making any notes; on the third reading, I noted any examples of talk that I believed to relate to conceptualisations of screen picture-making. These examples of talk were coded. An example of this process is recorded in table 4.3.

Table 4.3 Coding of interviews

Interview Extract	Initial Notes	Thematic Coding	Spectrum
<p>I would be <u>happier</u> to see a child with a pen or a pencil or a crayon in their hand and a piece of paper than <u>I would sat at a screen drawing</u>. If they're <u>always</u> doing that and <u>never</u> holding a pen and pencil, I <u>would worry</u> that way around, but if they're <u>always</u> drawing but <u>never</u> on a screen, I wouldn't worry.</p>	<p>Emotional reaction – happiness</p> <p>Assumptions about materialities of the practice</p> <p>Concern over extreme' scenarios</p>	<p>Practitioners' approach</p> <p>Interaction</p> <p>Balance</p>	<p>Physical movement/static engagement</p>

Once the first interview was coded in this manner, the same process was applied to the subsequent interviews. The same codes as in the first interview were used where they were applicable, but codes were also added whenever a new example of talk was unclassifiable using the established codes. The process of adding codes was continued until this was no longer necessary: this was considered to be the point

of analytical saturation (Braun & Clarke, 2006). I grouped these codes into twelve themes:

1. Experience
2. Intentionality
3. Expression
4. Maturity
5. Engagement
6. Confidence
7. Interaction
8. ICT learning
9. General learning
10. Abstraction
11. Practitioners' approach
12. Balance

In making sense of these themes however, I realized that they needed to be understood in relation to each practitioner's approach to early learning more generally. With this in mind, I used the themes as a starting point for the construction of seven spectrums, onto which could be plotted both practitioners' conceptualizations of screen picture-making and their approaches towards early learning more generally. The seven spectrums were:

1. Sensory experiences/Abstract understanding
2. Physical movement/Static engagement
3. Navigation of a familiar environment/Exploration of an unknown environment
4. Interaction/Independent activity
5. Self-expression/Exposure to external stimuli
6. Feeling like a novice/Feeling like an expert
7. Control/Experimentation

By mapping both types of perspective onto the spectrums, it was possible to see how practitioners' views of screen picture-making were constructed in relation to their perceptions of early learning. The process made evident any existing tensions between what practitioners believed children should be doing at the age of 4-5 years compared with how they envisaged the practices of screen picture-making. The process of spectrum-mapping is outlined in more detail in Chapter 9.

4.5 Conclusions

As discussed in the introduction to this chapter, it was necessary for me to use a range of methods in order to explore the research questions underlying this thesis. Each method was carefully chosen and, when necessary adapted in order to be appropriate within a study of meaning and medium in young children's picture-making. The insights and tensions that develop when methods are used in conjunction with each other mirror those that arise at theoretical boundaries in interdisciplinary research. I decided to use experimental comparisons, interviews and a social semiotic ethnography in order to understand both the material and the social aspects of children's screen picture-making. I framed all of these methods within the 'longer conversation' described by Lillis (2008), whereby participants are actively involved both formally and informally in the project of research over a relatively long period of time. Thus, although the methods I have used are different to one another, the way I conducted the research meant that they were in dialogue with one another and contributed to a coherent narrative about the construction of young children's screen picture-making as a social semiotic practice.

Chapter 5

Comparing picture content between page and screen

5.1 Introduction

The analysis in this chapter relates to two of my research questions:

RQ1: How is children's screen picture-making similar/different to their paper picture-making?

RQ2: What are the distinct affordances of screen picture-making?

It considers these questions in terms of the content that is included in children's pictures and the affordances that guide the inclusion and exclusion of picture content. In order to explore these questions, experimental comparisons were conducted in which 36 4-5 year olds were observed as they made pictures on paper and the computer. The participants were randomly allocated to one of two groups, each with 18 participants. During the second session of picture-making, one group used paper to make their pictures, while participants in the other group made pictures on the computer using the software *tuxpaint*. The differences between groups in the pictorial content included during this session are the main analytical focus in this chapter.

The first section of this chapter focuses on the analytical categories which were used to compare content between page and screen in the second session of picture-making. These categories were established with reference to literature in the field. My understanding of the categories was developed further through their application to the paper pictures that were created by all 36 children in the first session of picture-making. These categories were then used to analyse picture-making in the second session and to make comparisons between the content produced on paper and on screen. In the second half of this chapter, I conduct an in-depth exploration of the material and social

affordances that gave rise to the distinct content found within children's screen picture-making as compared with their paper picture-making. In particular, I consider the reasons underlying the marked lack of people, places and action found within the screen pictures, and the re-direction of the children's attention towards image use and experimentation with the tools available. When children used the screen medium to create their pictures, their focus shifted from the referential dimension to the experimental dimension. Evidence and reasons for this shift will be based on specific examples drawn from the data I collected, as well as previous literature in the field.

5.2 Establishing analytical categories

Based on a review of the existing literature, I decided on a set of categories that would guide my analysis of content in young children's pictures: *people*, *places*, *action*, *image use* and *experimentation*. In order to understand these categories better and to ensure that they were a valid way of interpreting my data set I applied them in an analysis of the paper pictures created in the first session of picture-making. For each picture I examined whether there was evidence to suggest that the category of content played a part in the picture-making experience. The evidence I used was both in the picture itself, and in talk surrounding picture-making. The interplay between text and talk is discussed in more detail in the chapter on methodology (Chapter 4). Below I outline the categories that I decided to focus on and what an analysis of the first session pictures revealed about these categories.

5.2.1 People

Literature on children's drawing often notes the popularity of the human figure in the drawings of 4-5 year old children (e.g. Malchiodi, 1998; Thompson, 1999). The human figure is typically the first schematic representation to be developed in childhood, and it is used primarily to represent people of emotional significance in a child's life (Cox, 2005). In the visual texts from the first session of picture-making, people were the most frequently featured pictorial element. I identified people in 22/36 of the texts created and a total of 49 figures across these pictures. As well as being evident in the texts themselves, the popularity of representing people was clear from the talk that surrounded picture-making in the first episode. The talk of 18/36 participants referred to the depiction of a person in their pictures. As suggested by previous literature, the majority of references were made about specific individuals from the child's everyday life (e.g. family members), but fictional and unidentified figures were also included.

5.2.2 Places

As well as representing specific people or objects, children's pictures are often used as a forum for remembering or imagining a particular place (e.g. Anning, 2003; Labbo, 1996). An impression of place can be created through the talk that surrounds a child's picture-making. Alternatively, children can build a sense of place through the use of certain pictorial elements (e.g. grass, a sun) that are strongly associated with a specific environment. In this session, the talk of 9/36 participants suggested the representation of a place, and the pictures of 11/36 participants suggested the representation of a place.

5.2.3 Action

The representation of action has been related to the representation of place in the work of Labbo (1996) on kindergartners' screen text-making. In this research, the depiction of a landscape was a precursor to the development of action within the picture. Other researchers (e.g. Anning, 2003; Frisch, 2006) have suggested that action can be of fundamental importance in picture-making whether a strong sense of place is present or not. Pictures can act as a means of constructing dramatic scenarios that are acted out through the activity of picture-making. Based on the talk of participants, action was present in the pictures of 14/36 participants in the first session. An impression of action was conveyed in 7/36 pictures from this session. The discrepancy between talk and text in this analysis highlights the importance of analysing surrounding talk in order to make sense of children's picture-making (Cox, 2005). Some of the action represented related to everyday experiences (e.g. Gabriela's depiction of herself making a toy gun at the junk modelling table), while for others, action was imaginary or hypothetical. Joshua represented a collision between a toy digger and a toy crane. In the latter example, picture-making was integrated into dramatic play, and this was suggested through the excited talk, non-linguistic utterances and movement that accompanied the activity. It was also suggested by an interpretation of the visual text, which comprises flux rather than static and discrete representations (figure 5.1).

Figure 5.1. Joshua's picture, Session 1



5.2.4 Image use

Research conducted by Burnett and Myers (2006) on screen text-making among 8-9 year olds suggests that ready-made images are applied to texts in a considered manner by children, who demonstrate an 'awareness of the semiotic potential of these elements' (p. 20). While images weren't used in the first session of picture-making in this study, their use is central to understanding the pictures that were created in the second session, both those created on paper and those on screen. In the analysis of image use in the second session, I will consider the number of images applied in each picture and the manner in which they have been applied: whether images have been used as representations of the objects that they show, as representations of

other objects, as elements of design, or in experimentation with the tools and stimuli available.

5.2.5 Experimentation

The tools associated with picture-making facilitate experimentation as well as representation. The talk that surrounds picture-making can reflect an explicit interest in the material affordances of the tools being used (Chia & Duthie, 1993; Golomb, 1974). In this study, such talk might relate to the use of colour, the use of the craft tools (pencils, felt-tip pens, paper), the insertion of images, erasure and the organisation of the canvas (page or screen). These sub-topics are all relevant in the analysis of the first session, with the exception of image insertion, since participants did not have access to ready-made images in this part of the study. In the first session, 15/36 participants produced talk that related to experimentation and the materiality of the picture-making experience. Across these participants, there were a total of 64 fragments of talk that related to experimentation. By far the most popular type of this talk comprised references to colour (57/64 fragments). A much smaller proportion of references were to the organisation of space (7/64 fragments) and the use of craft tools (1/64 fragments). No references were made to the removal of visual material.

5.3 Session 2

In the second session, participants were asked to make a picture either on coloured paper using felt-tip pens, coloured pencils and stickers, or on the computer using the software *tuxpaint*. The analytical categories constructed and outlined in the previous section of this chapter were applied to the talk and texts of each group. In the following sections, I

discuss *people, places, action, image use* and *experimentation* first in relation to the paper pictures and then in relation to the screen pictures. Before considering each of these categories in turn, I provide an overview of the findings when pictures were made with paper (5.3.1) and with the computer (5.3.2).

5.3.1 Overview of paper pictures

Although participants in the paper group continued to use paper in the second session, they did have a greater range of media available to them than in the first session. They could choose from a selection of coloured paper, and could use felt-tip pens as well as coloured pencils. They also had a variety of ready-made images to choose from in the form of stickers, of which they could use as many as they wished. Despite these material differences, many of the trends in content found during the first session of picture-making continued to apply to the findings from this session. People were still the most frequently featured pictorial element in this session. The proportion of pictures conveying a sense of place and the occurrence of action increased when compared with the first session of picture-making, probably because this was a longer session in comparison to the first. The opportunity to insert ready-made images in the form of stickers was a major material difference between the first and second session and the majority of children were keen to use the stickers available. They were applied in a variety of ways but most often as a representation of the object that they showed. The increase in the tools available produced an increase in the proportion of participants who talked about the material affordances of the tools available. Most often, this talk was related to the application of colour suggesting that while the children were more aware of the material resources available in this session, it was still colour that occupied most of their attention in this respect.

5.3.1.1 People

When content was visually identified and categorised, people were the most frequently featured element in the pictures from the paper group in this episode. More than half of the participants in the paper group (10/18) chose to represent people in their picture. In total, there were 16 people clearly depicted in the pictures created. This finding was corroborated by the talk from the session, which suggested the representation of a person/people by 10/18 participants. The depictions of people related to a wide range of individuals in the children's everyday life: three children referred to themselves as elements in the picture, three to family members and one to peers. In addition to the representation of familiar figures, four children described the people that they were representing as fictional characters, and one participant depicted a fictional character from television.

5.3.1.2 Places

The depiction of particular places was popular among the participants in this group during this session. A visual impression of place was present in the pictures of 8/18 participants and the representation of place was suggested in the talk of 9/18 participants. Among the eight participants to convey a visual impression of a particular place, there was a remarkable level of detail. For example, Alfie's picture of a firestation (figure 5.2) involved the careful construction of an imagined environment, which took time and care to achieve. The participants may have included more detail in their representations of place in this session because they generally spent longer on these pictures than they had during the first session.

Figure 5.2. Alfie's picture, Session 2



5.3.1.3 Action

An impression of action was present in 7/18 pictures created in this session. The talk of 9/18 participants suggested the presence of action. As with place, action was important in the pictures of a greater proportion of participants during this session, when compared with the talk and pictures from the first session. This may again be the result of participants taking a longer time to develop their pictures and therefore using more detail in the construction of particular scenarios that involve both place and action. As in the first session, the action ranged from everyday experience to imaginary or hypothetical scenarios. As well as the representation of action, the picture-making experience could itself be an example of active and dramatic play (as suggested by Anning, 2003).

5.3.1.4 Image use

Stickers enabled participants to insert images that were fully formed. A majority of participants took this opportunity (15/18). Across the group, a total of 66 stickers were used. The stickers were used in a variety of ways that could be organised according to three broad categories of use:

1. The image as a representation of the object it shows. For example, the image of a magnifying glass in Alfie's picture is a representation of a magnifying glass (figure 5.2).
2. The image as a representation of another object. For example, Fred used stickers of blue and red pins to act as pieces of falling rain (figure 5.3).
3. The image as an element of design. For example, Gabriela applied stickers as a method of 'colouring in' the dress that she had drawn for the figure in her picture and to frame the picture (figure 5.4).

The category to which individual examples of use belonged could sometimes be determined through an analysis of the participants' talk. However, this information was often inaccessible to an observer, particularly as use could move fluidly between categories. With these ambiguities in mind, the first kind of use (the image as a representation of the object that it shows) appeared to be the most popular. When participants used images in the first way, they often felt compelled to provide explanations for why these objects had been included. This was exemplified in Alfie's talk, as he built his picture of the fire-station (figure 5.2) and incorporated stickers to represent written instructions, pens and a magnifying glass for use by the station officer. He explained that the pens were for 'writing the directions' and the magnifying glass was there 'in case they can't see'.

Figure 5.3 Fred's picture, Session 2

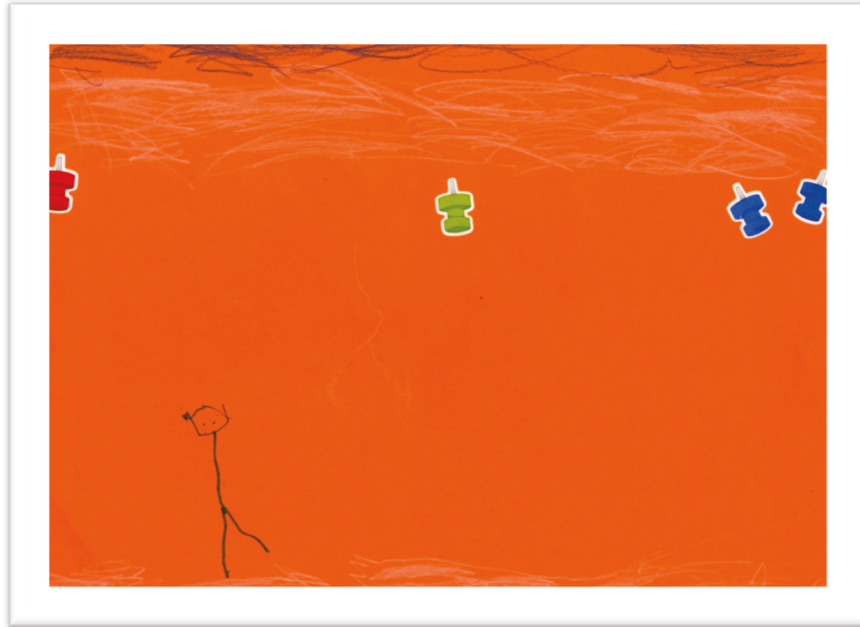


Figure 5.4 Gabriela's picture, Session 2



There were three instances of talk that clearly demonstrated the use of images in the second way, whereby the sticker was used to represent something different from what it actually showed. There was only a

single instance in which the images were used as elements of design, when Gabriela used stickers to frame the picture she had created and add colour to the figure's dress (figure 5.4). Regardless of how the ready-made images were used, their interaction with freely drawn images had a startling visual effect. The juxtaposition of these media created a strong sense of dynamism (an aspect of composition that I will explore further in Chapter 6).

5.3.1.5 Experimentation

A majority of participants in the paper group in session 2 produced talk that in some way related to experimentation or the material properties of the tools available (15/18). Across these participants, there were 71 fragments of talk relating to tools and experimentation. This is greater than the number of tool-related fragments produced in the first session even though they were produced by half the number of participants. This suggests that experimentation was more important in picture-making during this session. The most popular type of this talk again comprised references to colour (51/71 fragments). References to craft tools were made in 6 fragments (6/71) and references to the insertion of images were made in 14 fragments (14/71). There were no references to the organisation of space or to the removal of visual material.

5.3.2 Overview of screen pictures

In the second session, the computer group used the picture-making software *tuxpaint* to create their pictures. To ensure that the participants had a baseline level of competence using this software, I gave an interactive demonstration of the software to each child at the beginning of the session. Although children were shown a select set of tools to

work with, they often found other tools as they were making their picture. The different resources available for picture-making among members of this group corresponded to striking differences in the content that appeared in their pictures. People were not such a popular form of content among members of this group, and were included only as often as other categories of content, like animals or shapes. The representation of place and action occurred much less frequently than in the paper picture-making, suggesting that children were applying their attention and time to the representation of other types of content, or to non-referential dimensions of picture-making. The latter is suggested by the findings relating to image use and experimentation. The number of images present in the final pictures of children in this group was more than double those used by the paper group. Talk relating to experimentation and tool use was slightly increased, and of this, the focus was as much on erasure and image use as it was on colour.

5.3.2.1 People

People were not the most popular form of content for this group. Only 3/18 pictures clearly contained the representation of a human figure. An analysis of talk corroborated this finding: people were mentioned by only 5/18 participants – the same number of participants to mention animals, and less than the number of participants to mention particular shapes. Of the human figures talked about, two were representations of the self, two were representations of family members and one picture included an unidentified person.

5.3.2.2 Places

The depiction of particular places in the second session was much less popular among participants in the computer group when compared with participants in the paper group. No pictures visually suggested the representation of a place. The talk of 3/18 participants suggested that the representation of place played a part in their picture-making. Although children in this group spent the same amount of time creating their pictures as participants in the paper group, they did not appear to spend the time developing a sense of place in their pictures.

5.3.2.3 Action

Only 3/18 finished screen pictures created a visual impression of action. The talk of 3/18 participants suggested that action was being represented in the pictures created. As with place, children in this group did not tend to engage with the representation of action. Although members of this group spent as long on their pictures as members of the paper group, the proportion of pictures conveying action was much less. All of the action represented was imaginary in nature, and no everyday activities were represented. Despite the decrease in the representation of action, there were still some examples of picture-making as a form of dramatic play (e.g. Jack and Yusuf). In such examples, the action was not simply present as an element of the picture's content, but was also enacted through the picture-making experience itself.

5.3.2.4 Image use

More than half of the finished pictures created by children in this group included the presence of at least one ready-made image (10/18). This

is a smaller proportion than in the paper group. Despite this, a total of 145 ready-made images were visible in these pictures, which is more than double the number of stickers used among participants in the paper group. Furthermore, given the high rate of removal and erasure among participants using the computer, the number of ready-made images used at some point in the picture-making session is likely to be even higher. These findings suggest that the use of ready-made images was a fundamental part of screen picture-making for the majority of children, but that these images were not always present in the finished pictures children create on screen.

Ready-made images can be used in a range of ways. As with participants in the paper group, the most popular kind of use among members of this group was of the image as a representation of the object it showed. This was followed by some talk indicating the third category of use – the image as an element of design. Beyond these categories, participants in this group often took a more experimental attitude to the images available. Sometimes the talk of the participants revolved around a desire to include more or different images on the screen, but not for the purposes of reference or aesthetic impression. In these cases, placing an image on the screen was akin to taking an object out of a box in order to look at it properly and either immediately putting it back (removing the object from the screen) or deciding to keep it out for further exploration. This kind of use had not been seen in the paper picture-making and it suggested that the experimental dimension of picture-making was foregrounded by participants in this group.

5.3.2.5 Experimentation

Of the 18 participants in this group, the talk of 14 was in some way related to experimentation and the tools available. Across these

participants, there were 90 fragments in total relating to experimentation and the tools available. The most popular of these references were to erasure (30/90), colour (29/90) and image use (27/90). Erasure and image use are categories of experimental talk that had not been popular among members of the paper group. There were also references to craft tools in 8 of the fragments (8/90) and references to the organisation of space in 4 fragments (4/90).

5.4 Affordances of screen picture-making

Having outlined the differences in pictorial content that occur when children make pictures on paper and on screen, I will now consider the distinct affordances that give rise to the patterns of pictorial content seen in the context of screen picture-making. In the following section, I explore the material and social affordances that led to the marked lack of people, places and action found within the screen pictures, and the re-direction of the children's attention towards image use and experimentation with the tools available. In order to explore these issues, I draw on specific examples of talk and text from the data that I have collected, as well as previous literature in the field.

5.4.1 People

The talk of participants in the computer group suggests that the move away from human representations was often because members of this group found creating a human outline using the mouse more difficult than drawing with a pencil. This was explained by Gertrude: 'I'm trying to do a picture of me but the eyes went a bit wrong'. This sentiment was echoed by other participants. For example, Richie exclaimed after attempting to use the 'paintbrush' tool 'I can't draw anything' and Peter

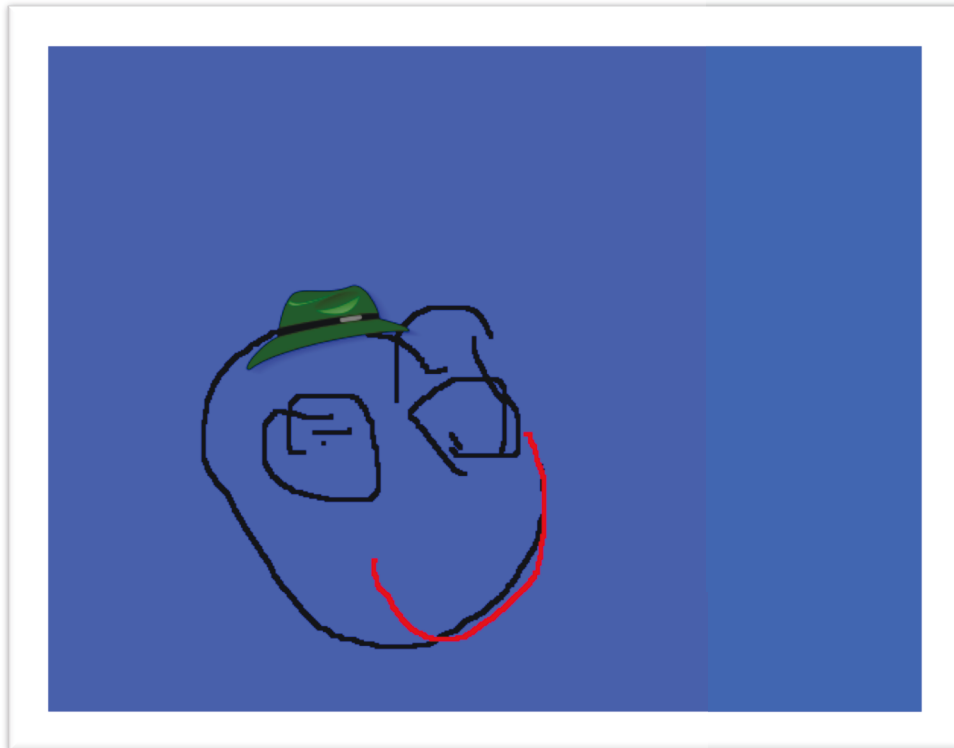
explained that he was attempting to draw facial features using the mouse but had 'done them a little muddled up'. Despite the difficulty that children had in controlling the mouse in order to depict a human figure, some persevered in its use to represent people. Abe created a picture of his brother (figure 5.5) in a similar way to if he had drawn the figure on paper, but the finished product does also demonstrate that there was difficulty in achieving this. The shapes typically involved in the human figure schema, and in particular the circles often used to represent the head and trunk, are less fluently produced when a mouse is used. This can be seen in Abe's picture, and also in Mischa's picture (figure 5.6).

Early research on children's use of computers stressed the importance of competence with mechanical tools. For example, Matthews and Jessel (1993) argued that the first task of pre-schoolers when using computer paintbox software was to work out how to use the mouse to produce skilled drawings. More recent findings however, suggest that while children do show an interest in developing the skill of mouse manipulation, the extent to which this inhibits their creative picture-making on screen has been exaggerated. Donker and Reitsma (2005) found a surprising level of competency in mouse manipulation among 104 children aged between 5 and 7 years of age. In this study, the accuracy with which children moved the mouse tended to be high among the very youngest participants, although there were increases in speed with age. This finding suggests that the difficulty of using the tools involved in screen picture-making cannot fully account for the nature of pictorial content included in screen pictures, and in the case of my findings, it cannot fully explain the lack of people represented in screen pictures when compared with pictures made on paper.

Figure 5.5 Abe's picture, Session 2



Figure 5.6 Mischa's picture, Session 2



Another material factor that may contribute to the lack of people represented in screen pictures is the plethora of digital tools in *tuxpaint* that users can explore and try. Unlike on paper, screen picture-making occurs within a visual frame that constantly suggests new activity. Thus, when a child is drawing an image using the 'paintbrush' tool, the possibility of using the 'stamp' tool or the 'eraser' tool is always visually present. These stimuli may distract children from the act of representing a human step by step. In the pictures of Anastasia and Peter, a human figure was initially drawn but then entirely covered over with ready-made images that were chosen using the 'stamp' tool. This suggests that while children may approach picture-making with the intention of reproducing established schemata, they may be encouraged to try new activities and types of picture-making as a result of the alternative tools that are visually available. This material component of screen picture-making plays a part in children's embodied experience of the digital environment (Dourish, 2001). It can also be conceptualised as part of the 'semiotic potential' (van Leeuwen, 2005, p. 4) of the experience.

While some participants in the computer group did attempt to construct a human figure and then gave up, the majority did not attempt a human figure at any point. This suggests that the difficulty of manipulating the mouse, and the possibility of becoming distracted while drawing a human figure, cannot be the only important factors to consider. In addition to material properties, there may be social affordances that help to explain the lack of people included in children's screen pictures. Holt (1997) has shown that young children expect adults to value referential representations over abstract representations in the context of paper picture-making. This might mean that on paper, children are more likely to represent human figures and other typical schemata in order to meet the expectations of significant adults as they perceive them. This is likely since previous research has shown that the expectations of adults does shape what children choose to represent on

paper and how they go about the task (Thompson, 2003; Anning; 2003). Labbo (1996) argued that screen text-making would afford greater variety in its use by children because adults impose less expectation on the medium, and children perceive less expectation with it. Although the prevalence of the screen has grown since this research was conducted, its uncertain use within nurseries does mean that the expectations surrounding it are likely to be less 'fully and finely articulated' (Kress & Jewitt, 2003, p. 2). Thus, the social affordances of paper picture-making include a high value placed on the representation of human figures, while such a value is less established in the context of screen picture-making as a result of the relative novelty of the medium.

The possibility that children may experience more freedom when working on the screen is supported by evidence from specific cases in this research. For example, there was a shift in Lewis's talk when he went from making a picture on paper during the first session to making a picture on screen during the second session. His talk in the first session was almost exclusively concerned with his competence in depicting a human figure, describing the body parts he felt able and unable to successfully depict. On the other hand, his talk in the second session related exclusively to his likes and dislikes and these preferences guided the inclusion of content in his screen picture. He applied ready-made images of cars onto the screen in different colours, and exclaimed 'I like vehicles', 'I need some more...', 'I wanted two... two blue cars.' This change in talk suggests that while he judged his output in the first session according to adult-imposed standards in the representation of content, his screen picture-making was an opportunity to explore visual material that was personally exciting to him.

The example of Lewis also highlights the need to rethink the assumption that people are the most emotionally significant type of

representation that a child can choose to make. Previous literature (e.g. Malchiodi, 1998; Cox, 2005) has tended to place great value on children's depictions of loved ones. However, these depictions may be so popular as a result of children being aware of the value placed by adults on such representations (Holt, 1997; Rose et al., 2006), and of knowing how to achieve successful representations of this content through a checklist of schematic features. Representations of alternative content, and representations in the form of ready-made images, may be just as emotionally resonant for young children as representations of humans. The research of Thompson (2003) and Dyson (2003) has highlighted the emotional attachments that children form towards visual stimuli that are less valued by adults. Images from popular culture may be an essential part of the 'kinderculture' (Thompson, 2003) in the early years classroom, though practitioners often ignore or devalue children's engagement with these images (Dyson, 2003). Screen picture-making can therefore challenge the discourse that surrounds paper picture-making in the early years classroom by foregrounding the use of popular ready-made images that have personal significance to children at the expense of the human figure representations that adults most value in the context of paper picture-making.

5.4.2 Places

The majority of children making pictures on screen did not locate their picture in a particular place. We can begin to understand why this was the case by looking at how place was created in the few examples in which it was part of the screen picture-making process. When place was represented by children making their pictures on screen during this study, it was typically achieved in a different way to the representation of place on paper. In the pictures of Jack and Gertrude, a sense of

place was created following experimentation with the 'stamp' tool and the multiple application of the same ready-made image onto the screen. In Jack's picture (figure 5.7), the image of a car was placed multiple times onto the screen and this was followed by the declaration: 'See, it's a car park'. In Gertrude's picture (figure 5.8), the image of a duck was placed multiple times onto the screen and this was followed by the declaration: 'I'm at the duck pond. That's why I'm doing lots of ducks'. The latter example of talk strongly indicates that place can follow experimentation with images and can be used to explain the visual impact of these images. Jack and Gertrude sought to provide a justification for their activity on screen, and this was enabled through the invocation of place. In paper picture-making, place was referred to prior to the insertion of ready-made images, and images were selected on the basis of being appropriate in the context already established. This idea is developed further in my analysis of narrative in Chapter 6. It highlights the importance of analysing the sequence of activity when considering the embodied interaction of individuals with digital environments (Dourish, 2001). In the examples of screen picture-making mentioned above, visual experimentation on the screen acted as a prompt for action and narrative while on paper, visual material was added in order to be illustrative of it.

Figure 5.7 Jack's picture, Session 2

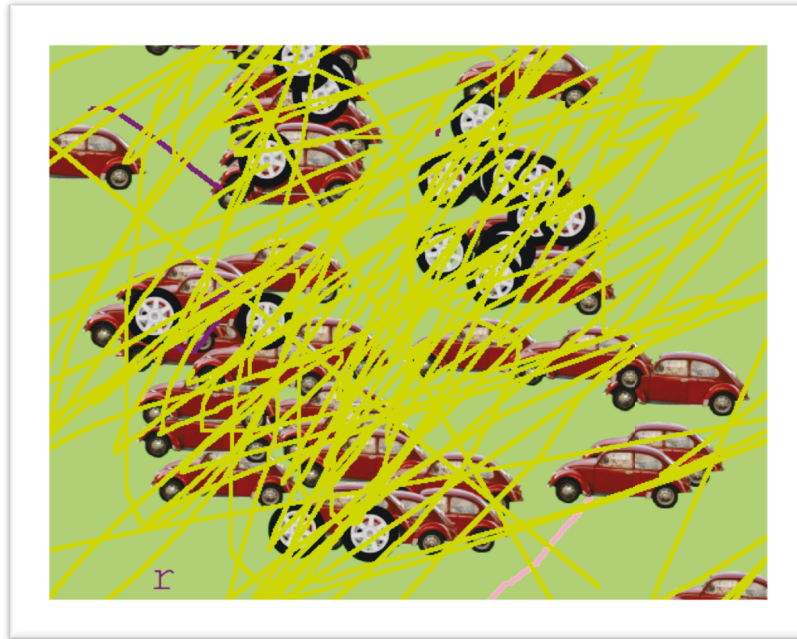


Figure 5.8 Gertrude's picture, Session 2



We can better understand the need to justify what has been placed on screen by considering the theoretical notion of the 'empty signifier'. In the poststructuralist semiotics of Barthes (1977) and Derrida (1980), an 'empty signifier' is one that is not clearly anchored to a signified meaning. In a picture made up of random dashes or unconnected images, the signified meaning is unclear to the viewer and there does not appear to be a one-to-one relationship between signifier and signified. In their picture-making, children may be more or less comfortable with the presence of 'empty signifiers' and this will partly depend on the associations that children have with the medium they are using. Jack and Gertrude used place to justify their use of images and impose a sense of referential coherence in their picture-making. In contrast, Seb and Peter both manipulated images on screen without ascribing a discernible pattern of signified meaning. The finished pictures of the latter two children (figures 5.9 and 5.10) follow some rules of visual coherence but do not have referential coherence.

Figure 5.9 Seb's picture, Session 2



As mentioned, the tolerance that children have for the presence of unexplained ‘empty signifiers’ in their picture-making may be partly dependent on the medium they use to make their pictures and the cultural associations of the medium (Eco, 1976). In the context of paper picture-making in the classroom, ‘empty signifiers’ are not generally valued (Holt, 1997; Rose et al., 2006; Cannatella, 2008). A finding that I will explore more in relation to the interviews I conducted with practitioners (Chapter 9) is that practitioners find non-referential dimensions of picture-making unsettling since they conceptualise pictures as vehicles of information about children’s everyday experiences. This resonates with Derrida’s (1980) assertion that the signifier is often subordinated to the signified; texts are understood as containers of meaning and if the meaning is not readily available, the text is less valued. In the established practice of paper picture-making, it is this approach that children are likely to have internalised and to be acting upon. The less articulated affordances of screen picture-making may offer more scope for the presence of ‘empty signifiers’ and this may explain why place and other typical representations were less present in the examples of screen picture-making that I collected.

Figure 5.10 Peter’s picture, Session 2



It is important to note that my findings with regards to the representation of place conflict with the research of Labbo (1996), which found that screen texts, when compared with paper texts, were more likely to act as landscapes for the children to inhabit in their imaginations. The conflict may be explained by some vital differences between Labbo's study and the research I have conducted; in particular there was a vital difference in the audience or 'interpretive community' involved in either set of practices. In Labbo's research, the texts were being made in the naturalistic free-flow environment of the kindergarten classroom. As a result, the children were most often making the texts collaboratively, and were therefore projecting representations onto the screen that they knew would be meaningful to other children in the class. In contrast, the children in my study made pictures independently, with only me to 'perform' for. As an audience, I had constructed a forum in which the experimental dimension of picture-making was as valued as the referential dimension. This was the case as a result of the interactive demonstration I had given at the beginning of the session, which outlined the different tools available and encouraged participants to use them without necessarily having developed a clear idea of the picture's subject matter. This is unlike the 'interpretive community' of the early years classroom, which emphasises the referential dimension of picture-making (Rose et al., 2006; Cannatella, 2008). Thus in Labbo's study, where screen picture-making was clearly framed by the early years classroom environment, the representation of place may have been foregrounded by children as a key purpose of picture-making while this did not emerge in the context that I had constructed for the sake of this research.

5.4.3 Action

There were fewer representations of action among children making pictures on screen. In paper picture-making, action was most often the consequence of oral narratives about pictorial elements. In screen pictures, this kind of action was replaced with a dynamism that stemmed from the material properties of the picture-making experience itself. The sense of action in screen picture-making stemmed from the immediate application and removal of marks and images. A preoccupation with this type of action was apparent in the talk of participants. For example, Theo did not produce any talk describing action in the picture he was creating, but instead outlined the actions he was currently engaged in e.g. 'Paint, paint, paint. I want to clear the page...' The actions associated with the materiality of the medium fully absorbed his attention. This may be the result of the unfamiliarity of the screen medium in the context of picture-making, relative to paper. Previous literature has highlighted the likelihood that as a medium becomes increasingly familiar, the amount of conscious attention demanded by its material presence will decrease. The medium will become more integrated into the everyday existence of its users and less visible in its mediation of meaning (McLuhan & Fiore, 1967; Heidegger, 1962/1927; Dourish, 2001).

The majority of pictures created on paper were accumulations of static referential content. However, as the research of Anning (2003) has demonstrated, a significant minority of children do go against this norm and build action and dramatic play into their pictures. These pictures are visually different. They are often mistaken for 'scribble' because object boundaries are not respected, and a large flurry of activity covers the page. This type of visual impression was present in a smaller proportion of the pictures made on screen; only two of the screen pictures represented action in this way. Yusuf drew a house that was

then attacked by monsters and he captured the attack in the marks made on top of the drawing of the house (figure 5.11). In the other example of dynamic picture-making, Jack stamped an image of a car onto the screen multiple times. Above these images, he placed a layer of dynamic movement with the 'paintbrush' tool that covered the cars. He referred to this layer as a 'net' and explained that the cars were trapped behind the net (figure 5.7).

Figure 5.11 Yusuf's picture, Session 2



As with the representation of place, my findings appear to contradict those of Labbo (1996). She reported the frequent construction of the computer screen by children as a stage upon which they performed actions for one another. I would suggest however, that the action of experimentation (as opposed to action that is represented) can also be understood as a performance. In the interviews conducted by Burnett

and Myers (2006), 8-9 year olds sometimes explained why they had added a ready-made digital resource to a text by saying that they had simply desired for the action to take place. It is also important to note that the software used by Labbo in her research did not include abundant quantities of ready-made images that could be applied and removed at the single click of a button. I have suggested that the rapidity and abundance associated with this facility established an alternative way for children to create a sense of action that diminished the need for referential action. Had the children in Labbo's study been able to play with images in this manner, there may have been less representational action of the type she recorded.

Experimentation was validated through social as well as material affordances of the medium. In making a picture with only me present, children's experimentation was validated since I had already conducted an interactive demonstration that was solely about the capabilities of the tools available. The influence of this interactive demonstration as a means of setting expectations around use of the medium was demonstrated by the way children mirrored the language I had used in order to make sense of their own experimentation. Thus, Richie explained his tool use stage by stage, as I had done in the interactive demonstration: 'I think I'll rub it out', 'I'll go onto draw again'. The children understood me as an audience with different expectations to the practitioners that they were used to. Through my presence, there was a new 'interpretive community' with a different set of social codes, which included value placed on the experimental dimension of picture-making. Thus, while Labbo (1996) considered the computer to be more open in its use, I would argue that the medium continued to be 'charged with cultural signification' (Eco, 1976, p. 267) but that this was more clearly shaped by my own input into the children's picture-making, and less by the teachers and families of the children who participated.

5.4.4 Image use

Participants making pictures on screen were less constrained in their use of images and were more likely to use images that did not relate to other content in the picture. For example, Seb's picture-making mostly involved applying multiple copies of different images offered by the 'stamp' tool (figure 5.9). He did not try to explain why he had used the stamps as some of the other children did (e.g. Gertrude) but instead placed these objects in large quantities amidst almost entirely non-linguistic utterances (singing to himself, murmuring). The way in which such varied images were applied to the page, and the lack of verbal reasoning that accompanied them, suggest that the application of these images was a pleasurable part of his embodied interaction with the technology. The images acted as 'empty signifiers' since they were not clearly attached to any particular signified meaning. Although the images can not be thought of as abstract in themselves (they are clearly representations of objects in the world) they were, in this case, used to facilitate abstract, non-referential picture-making.

The use of the *tuxpaint* images was understandably enticing. The images available through the 'stamp' tool are brightly coloured, perfectly formed and, unlike the stickers, there is no chance of ripping them during application. The images contribute to visually striking screen pictures. Furthermore, the addition of images can happen at the single click of a button through use of the 'stamp' tool. While ready-made images were also available in the paper context, their application was less immediate among members of this group. As well as the immediacy of the application, images on the computer were more likely to be applied multiple times. The likelihood of multiple application was increased by the design of the 'stamp' tool and, in particular, the property that once an image had been placed on the screen, an outline of the image remained hovering above the screen so that a single

additional click of the mouse would immediately place a copy of the image onto the screen. In contrast, using stickers on paper required peeling the sticker from its backing and I often had to help with this.

Because of the ease with which images could be removed from the screen in the computer group, participants in this group tended to explore the images available more freely. They would often stamp an image onto the screen and swiftly remove it. This was a process similar to removing an object from a box in order to have a better look at it and then either deciding to put it back straightaway or to use it in subsequent play. This option wasn't available to children using the stickers as it was difficult to remove the stickers from the page. No children in the paper group referred in their talk to the erasure or removal of visual material, while this was a popular topic of talk among children making pictures on screen. While Burnett and Myers (2006) argue that 8-9 year olds typically use ready-made digital resources in a careful and planned way, they do also recognise that at times, children apply images in an experimental way, without a clear idea of how they will be incorporated into the text. Thus, a variety of material factors that influence children's embodied interaction with the medium, including the easy application and easy removal of ready-made images in *tuxpaint*, led to the increased use and removal of images among children in the computer group.

As well as these material factors, it is important to consider the role that social expectations may have played in the patterns of image use that emerged in each group. For example, the stickers available to members of the paper group might have been more associated with reward than with picture-making. Children are taught to value stickers as special commendations and to expect to receive only one at a time. In addition, children are not typically encouraged to incorporate ready-made images into their paper picture-making. Some practitioners see the inclusion of

ready-made images as an imposition upon a child's self-expression; there is little room for ready-made images in the 'unfolding' discourse that typically surrounds young children's picture-making in early years classrooms (Gardner, 1982; Hawkins, 2002; see Chapter 9 for a more detailed discussion of how discourse relates to the opinions expressed by practitioners). Thus, although the children in my study were invited to use the stickers as tools in their picture-making and were reassured that they could use as many as they wanted, they were perhaps still constrained in their use of stickers. In contrast, ready-made images available in *tuxpaint* did not have an association with reward. Indeed, I had modelled the use of the 'stamp' tool as part of the initial interactive demonstration, and it had therefore been constructed as an acceptable and valued possibility within their screen picture-making. Beyond my interactive demonstration, the children's picture-making may have been in dialogue with other social cues that suggest the screen is a valid 'remix' medium, in which the selection and addition of ready-made visual information is an appropriate and valued practice (Burnett & Myers, 2006; Knobel & Lankshear, 2008).

5.4.5 Experimentation

There was heightened experimentation when picture-making occurred on screen. The talk relating to experimentation provides further support for the main points introduced in the sections above: that dynamic experimentation with tools available in the screen medium largely replaced or superseded the referential dimension of picture-making; and that children using the screen medium engaged readily with the 'digital remix' (Lankshear & Knobel, 2006; Knobel & Lankshear, 2008) possibilities of the medium, including the selection and application of ready-made images and the rapid addition and removal of visual information. For example, while Joshua's talk in the first episode had

related to the narratives he was representing in his picture, his talk in the second episode related almost entirely to his eagerness to experiment with the tools on the computer. He was less concerned with the communication or creation of referential meaning, and instead prioritised tool experimentation as shown by his talk: 'How do we rub out?', 'Why is this big square... makes it go off really fast?', 'That's so funny. Look at how thick this is'.

Previous literature suggests that experimentation and inquiry is more likely in the context of tools that are unfamiliar (Mercer & Wegerif, 1999; Price & Pontual Falcao, 2011). The example of Joshua's talk does suggest that he was experimenting with tools in order to make sense of what was available; he asked 'how' and 'why' effects occurred and drew attention to effects that were surprising to him. Whale (2002), considering more radical forms of computer art, argues that computers foreground experimentation because software renders a user's input, from the mouse or stylus, 'infinitely transformable' (p. 20). On paper, the movement of the inscription tool will typically mirror the trace that is left; in the case of screen picture-making, the product can be different to the point of unrecognisable on the basis of input. In the case of *tuxpaint*, children were most likely to spend time experimenting with tools that transformed input in an unexpected way, making the input-output relationship difficult to 'read'. The 'magic' paintbrush for example, could produce an impression of an emerging brick wall as the mouse was moved around. It was therefore not simply the unfamiliarity of screen picture-making that led to more of a focus on experimentation, but the increased presence of tools that can alter input in unexpected and exciting ways.

5.5 Conclusions

There were differences in the content included in paper and screen pictures. In screen pictures, there was a marked lack of people, places and action, and more of the children's attention was focused on image use and experimentation. These differences can be understood as a shift in focus from the referential dimension of picture-making when paper is used to the experimental dimension of picture-making when it occurs on screen. There were material and social affordances underlying this shift. The most important material factors were the plethora of tools available in *tuxpaint*, the unfamiliar effects they produced, and the visual prominence of such tools within the software. In particular the availability of visually exciting ready-made images that could be applied and removed to the screen with ease encouraged children to spend time manipulating these images as 'empty signifiers' rather than embedding them as part of a coherent representation involving people, places or action. Although this material property was essential in the differences that emerged between paper and screen pictures, it was only crucial as a result of its 'semiotization' (Bjorkvall & Engblom, 2010) through use. The use of the 'stamp' tool was conditioned by a different set of social codes to the use of stickers among the paper group. The 'interpretive community' (Fish, 1980) surrounding each activity was essentially different. While paper picture-making happened with reference to established expectations of practitioners and family members, screen picture-making was less influenced by social factors outside of the immediate situation and therefore more influenced by my expectations as the sole audience member.

The increased focus on experimentation in children's screen picture-making encourages us to re-think the value we place on different functions in children's creative activity. In the context of the early years

classroom, it the referential dimension of art that is most valued (Holt, 1997; Kolbe, 2005; Cannatella, 2008; Chapter 9). While this reflects a wider preoccupation with the representation of everyday subject matter in Western societies (Thompson, 2003; Chandler, 2007), the referential function is culturally configured and its prioritisation at the expense of other text-making functions is far from inevitable. Practitioners may appreciate clear references in picture-making because these allow them to use pictures as insights into children's everyday lives. In prioritising the referential dimension however, our understanding of other dimensions is inhibited, as is activity based upon them.

Chapter 6

Comparing picture composition on paper and screen

6.1 Introduction

The analysis in this chapter relates to two of my research questions:

RQ1: How is children's screen picture-making similar/different to their paper picture-making?

RQ2: What are the distinct affordances of screen picture-making?

It considers these questions in terms of the visual composition of children's pictures and how this is influenced by the affordances of the semiotic resources used to create them. As in the previous chapter, the comparisons are based on the results of a study that observed 36 4-5 year olds as they made pictures on paper and on the computer. The analytical focus is on the pictures produced in the second session of this study in which half of the participants made pictures using paper and the other half made pictures on the computer using the software *tuxpaint*.

The first section of this chapter focuses on the analytical categories that were developed in order to compare composition between paper and screen in the second session of picture-making. These categories were established with reference to literature in the field and sub-categories were developed by conducting an analysis of the paper pictures created by all 36 children in the first session of picture-making when only paper was used. The second part of the chapter applies these categories first to the paper pictures created in the second session, and then to the screen pictures made in this session. In this way, composition is compared between paper and screen. In the final section, I explore the

material and social affordances that gave rise to the distinct composition found within children's screen picture-making.

6.2 Establishing analytical categories

Based on a review of the existing literature, I decided on a set of categories that would guide my analysis of composition in young children's pictures: colour range, colour choice, balanced composition, spatial arrangement, object relations and image use. In order to develop sub-categories within these categories, I conducted a visual analysis of the paper pictures created in the first session of picture-making. Unlike my analysis of content (Chapter 5), this analysis was based primarily on the interpretation of the visual texts themselves. The reasons for adopting this approach were discussed in more detail in the methodology (Chapter 4). Below, I outline the categories that I decided to focus on and what an analysis of the first session pictures revealed about these topics.

6.2.1 Colour range

The pictures created in the first session varied in the number of colours used by children. Some children used a single colour on the white background, while others used as many as ten different colours. The mean number of colours used was 3.83. Since as many as a third of the participants used a single colour, it was clear that form took priority over colour for many of the participants. This supports the assertion of Golomb and Farmer (1983) that young children primarily express meaning through form rather than colour. The findings also indicate however, that from an early age, colour can be central in children's picture-making.

6.2.2 Colour choice

Three types of colour choice were evident in the pictures from the first session. Half of the participants showed no real interest in the colour they were using. They used one or two colours which did not relate in a conventional or consistent way to the content being represented or to subjective associations with the content. Of the remaining 18 participants, 5 made colour choices that closely and consistently reflected the colour of objects in reality (e.g. green grass and a blue sky). According to Golomb and Farmer (1983), such choices are typical of children in a slightly older age group. Thirteen pictures suggested through the range and patterns of application, that colour was a significant semiotic resource but not one to be used for the sake of realism. Instead, colour was used by these participants subjectively but consistently to represent their impressions of the world around them. For example, in Tom's picture (figure 6.1), the figure on the left is given multi-coloured hair to represent the distinctive qualities of this character. He explained: 'I'm the only one that's got colourful hair because I've got... because I'm the only that's got haemophilia'. Understanding this relationship is made available through talk; this again highlights the importance of a contextualised analysis of picture-making as advocated by Frisch (2006).

Figure 6.1 Tom's picture, Session 1



6.2.3 Balanced composition

Arnheim's comments on balanced composition suggest that whether it is achieved is a subjective impression of the viewer rather than an objective reality:

All such factors as shape, direction and location are mutually determined in such a way that no change seems possible... an unbalanced composition looks accidental, transitory and therefore invalid (Arnheim, 1974/1954, p. 20).

The impression however, that 'no change seems possible' related in my data set to three other factors which could be more accurately determined through a visual analysis: fill of the page, symmetry and spatial arrangement. As Gardner (1982) asserted, balanced composition could sometimes be achieved through complete fill, as in Tammy's picture (figure 6.2) or through symmetrical planning as in Anastasia's picture (figure 6.3). Spatial arrangement will be discussed

in more detail in the following section, but it is worth noting here that alternative arrangements could also create an impression of balance. The inclusion of a groundline or another visual path countered the typical unbalance that follows from an asymmetrical or lightly filled design. For example, Lexi's picture (figure 6.4) is asymmetrical and lightly filled, but the viewer's gaze follows a path from the bottom lefthand corner of the page towards the top right. The variety of factors that contribute to balance help to explain why, as a concept, balance has been described in a highly subjective manner. It remains an important characteristic to consider because it suggests the extent to which the physical organisation of a picture is a significant semiotic resource, without differentiating on the basis of how this resource was used.

Figure 6.2 Tammy's picture, Session 1



Figure 6.3 Anastasia's picture, Session 1

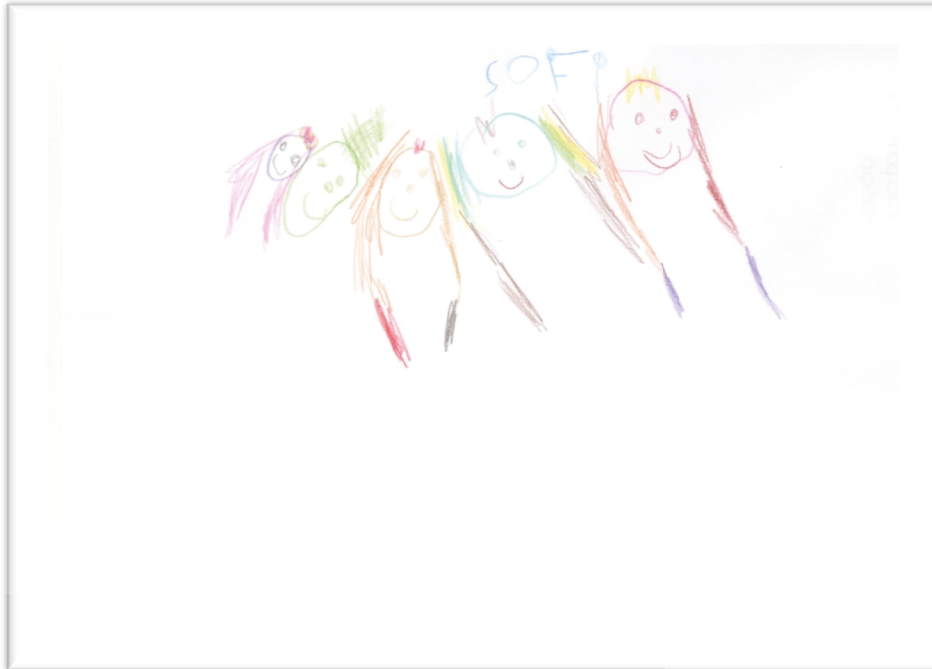


Figure 6.4 Lexi's picture, Session 1



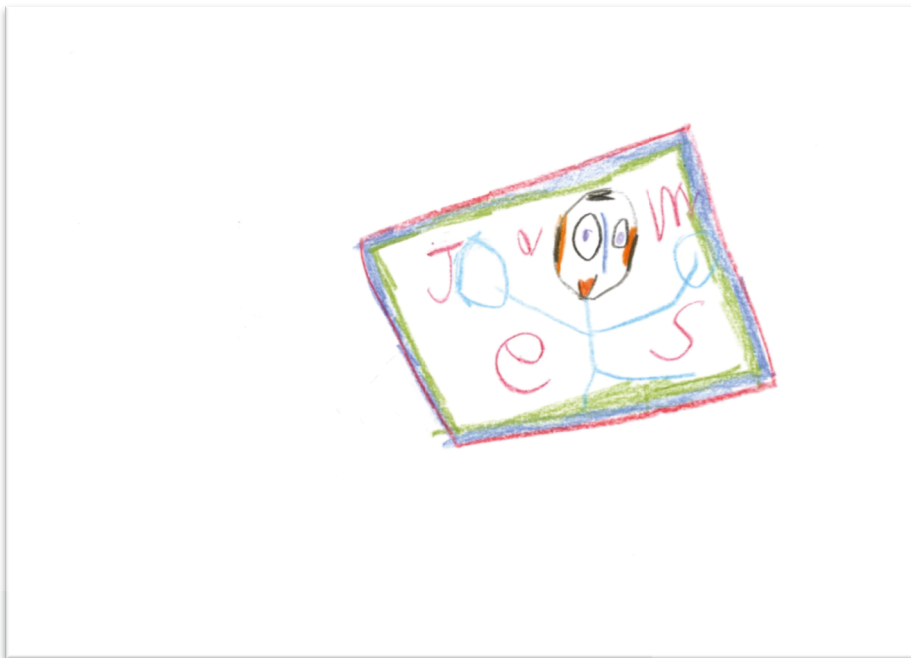
6.2.4 Spatial arrangement

Spatial arrangement can be understood as the route that a viewer's gaze takes through a picture. In Western art, the most valued journey through a picture is one from foreground to distance, where distance is signalled by the decreasing size of objects on the canvas (linear perspective). This type of composition is rarely, if ever, developed in early childhood (Winner & Gardner, 1981). Various other types of arrangement however, were visible in the pictures collected from the first session of picture-making. The largest proportion of participants (16/36) scattered objects across the page in apparently random positions, so that the viewer was encouraged to look from one object to another in no particular order; if there was a single object on the page, its position did not appear to be particularly significant. A more thoughtful approach to spatial arrangement was taken by a remainder of the participants. 10/36 of the participants included a groundline and/or skyline that clearly established a conventional landscape setting. Elements of other pictures suggested a topographical approach where objects appeared as they would from above. This can be seen in Richie's picture (figure 6.5) which maps objects and people within the classroom space. Interior framing was another possible approach that children could take. In Peter's picture (figure 6.6), the computer screen is used as an internal frame within his picture.

Figure 6.5 Richie's picture, Session 1



Figure 6.6 Peter's picture, Session 1



6.2.5 Object relations

Overlapping objects were noticeably uncommon in the pictures created by participants in the first session. This finding supports Cox's (2005) assertion that children tend to avoid overlapping object boundaries in their early picture-making. When overlapping did occur in the first session, it was in pictures that comprised multiple attempts at the same drawing rather than a sequence leading to a finished composition. For example, in Jack's picture (figure 6.7), the overlapping figures are a result of Jack repeatedly trying to draw the same figure.

While the proximity of objects to one another on the page appeared to sometimes be random, at other times, it was used to represent physical distance, social relationships, or both. In Reem's (figure 6.8) picture, the figures are arranged vertically around a large sun whose light pervades the entire picture. The figures, in their magnificent array of colours, are each given a position on the page to indicate their role or place within the family. Figures placed in the foreground are largest and appear to be the most important (they were also the first to be drawn), while figures in the background are smaller and less important.

Figure 6.7 Jack's picture, Session 1

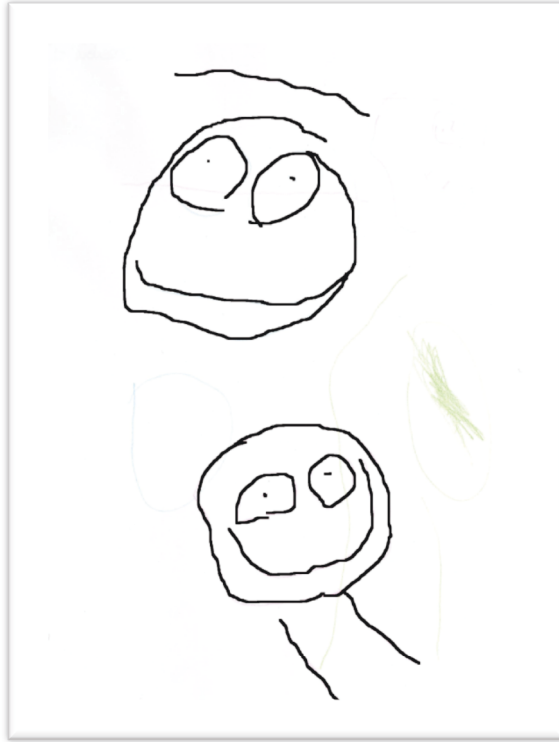
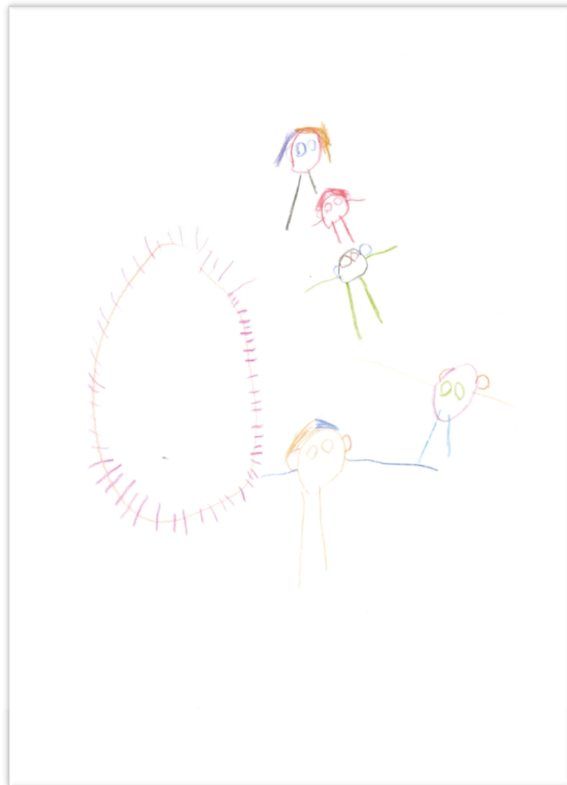


Figure 6.8 Reem's picture



6.2.6 Image use

Although the literature on children's use of ready-made images is limited, findings so far suggest that images are applied to texts in a thoughtful way by children (Burnett & Myers, 2006). They are used to inspire the creative process and at other times to create a particular visual effect. While images weren't used in the first session of picture-making, their use is central to the composition of pictures created in the second session, both those on paper (when stickers were used) and those on screen (when the 'stamp' tool was used). The questions I plan to ask about image use in relation to composition are as follows:

1. Are images applied to represent additional content or as non-referential elements of design?
2. How are they positioned in relation to each other and in relation to other objects in the picture?
3. What is the visual impact of their application?

6.3 Session 2

In the second session, participants made a picture either on paper or using the computer software *tuxpaint*. The categories and sub-categories constructed and outlined in the previous section were used to guide a visual analysis of each of the texts created. In the following sections, I discuss colour range, colour choice, balance, spatial arrangement, object relations and image use first in relation to the paper pictures and then in relation to the screen pictures. Before considering each of these sub-topics in turn, I provide an overview of the findings when pictures were made with paper (6.3.1) and with the computer (6.3.2). Following this analysis, explicit comparisons will be made between the pictures created using either set of semiotic resources. In the final section, I suggest material and social affordances

that could account for the distinct composition of screen pictures. I support these suggestions with specific examples from my data and with reference to previous literature in the field.

6.3.1 Overview of paper pictures

The semiotic resources used by the paper group in this session, while still paper-based, were different to those used in the first session, and this led to some minor differences in composition. For example, the presence of a coloured background led to less varied colour use via inscription tools. Colour continued however, to be significant in the production of meaning and half of the participants used it in a careful and planned manner. Some of these participants were striving towards realism, while others made subjective but consistent choices with regards to colour. In terms of the organisation of space, balance was achieved by a majority of participants. Complete fill, groundlines/skylines and other forms of spatial arrangement were used in order to achieve an impression of balance. Having said this, the complexity of the physical organisation of the canvas seen in this session encouraged me to think not in categories of spatial arrangement, but rather about the different spatial elements that might be present in a picture and the way they each influence how a picture is understood by the viewer. Stickers followed different rules of interaction to the drawn images in the picture since they often overlapped with drawn objects and therefore crossed object boundaries. They were significant both in terms of the content they represented and as elements of design; they could be used in either way to create meaning.

6.3.1.1 Colour range

The range of colours used by children in this group was zero to six, and the mean number of colours used was 2.4. Thus, children tended to use fewer colours in this session than in the previous session. This is still in line with Golomb and Farmer's (1983) assertion that young children prioritise meaning expressed through form rather than colour but also suggests that this depends on the media that children use in their picture-making. The material properties of the resources available during this session (coloured paper, felt-tip pens, coloured pencils and stickers) may help to explain why fewer colours were used by children in this session. The background and the stickers may have achieved some of the 'colour work' that a child would have otherwise created using the drawing implements available. For example, in David's picture (figure 6.9), a colourful effect is achieved without the application of a single colour via coloured pencils or felt-tip pens.

Figure 6.9 David's picture, Session 2



6.3.1.2 Colour choice

As in the first session, three types of colour choice were visible in the pictures made during this session and half of the participants showed minimal colour choice (9/18). They appeared to use colours because they were close to hand or were preferred independently of what was being represented. Of the remaining participants, there was a divide between those that applied principles of realism and those that made subjective but consistent choices about colour. The same proportion of children used colour in a thoughtful way as in the first session, despite the difficulty of applying colour to a coloured background. Thus, while the latter appeared to constrain colour range, it did not shift the underlying practices regarding colour use. Some participants fully incorporated the coloured background into the referential content of their picture. For example, the green background in Daniel's picture (figure 6.10) was used to represent grass, and this decision acted as the starting point for the action contained within the picture (rain falling on objects on the grass).

Figure 6.10 Daniel's picture, Session 2



6.3.1.3 Balance

Balanced composition was achieved by a majority of the participants (12/18) in this group. The new semiotic resources available did not appear to interfere with this aim, which was achieved in a variety of ways. Six of the twelve children who achieved balance did so through a complete fill of the page; four children used the presence of a groundline to establish balance; and two used symmetry.

6.3.1.4 Spatial arrangement

As the finding about balance demonstrates, the organisation of space was a resource utilised by the majority of participants in this group to create and communicate meaning. The manner in which this was achieved however, varied greatly. The representation of a conventional landscape format was common, as demonstrated by the presence of a groundline in four of the pictures. But there were also examples that relied on distinct visual pathways that I had not seen previously. In Ali's picture (figure 6.11), space was used to represent not only physical proximity, but the chronological progression of a narrative. New space was found for the most recent events in the narrative, though this was often on top of objects that were already drawn. This wasn't problematic for Ali because his priority was making space for each subsequent event. As long as consecutive events occupied different spaces, layering was acceptable.

Figure 6.11 Ali's picture, Session 2



Some of the pictures created by children in this session were disorientating because they seemed to involve various types of spatial arrangement simultaneously. In Tess's picture (figure 6.12), the arrangement is particularly difficult to categorise. The main object in the picture is not immediately recognisable, though it may be some kind of figure (possibly a ghost) as indicated by the presence of 'eyes' towards the top of the object. If it is a figure, it is being seen by the viewer head-on, but it could equally be a topographical representation. Furthermore, the marks made along the short edge of the page could be a groundline, or could be part of the topographical impression. The difficult analysis of this example alerts us to the possibility that spatial features can be used in conjunction with each other to create a particular effect. This will be a disorientating effect if each feature suggests an alternative kind of representation. Rather than categorising pictures in terms of space, we need to be aware of the different spatial features that can be used by the picture-maker, and the types of effect that these are likely to have. In the analysis of the pictures made by those using the computer in the second session, I adopted this approach – prioritising the features of spatial arrangement and their effect rather than overall impressions.

Figure 6.12 Tess's picture, Session 2



6.3.1.5 Object relations

In line with the expectations of Cox (2005) and the findings from the first session, the overlapping of drawn objects was uncommon in pictures made during this session. Stickers however, interacted with drawn objects differently. They were often placed on top of or within boundaries. Thus, different forms of media led to different types of object relation, and in turn, created a distinct visual impression. In Caspian's picture (figure 6.13), the placement of the sticker on top of the house creates an impression of flux, which is aided by the referential content of the sticker (a vehicle in profile). The striking visual impression created by a combination of ready-made images and drawn images has been a popular style in recent visual media for children. For example, illustrations used in the popular book and television series

Charlie and Lola achieve a sense of dynamism through this juxtaposition of media.

Figure 6.13 Caspian's picture, Session 2



The differences in scale that occurred between drawn and ready-made images made it difficult for participants to achieve the complete referential integration of stickers. Having said this, some participants did carefully strive towards such integration. For example, in Jasmeen's picture (figure 6.14), the stickers are positioned with respect to the drawn images included in the picture. The picture is of a bedroom, and the stickers are used to represent objects in this scene, placed either on the desk or the shelves. Laws of physical proximity could be applied to stickers by participants even when the stickers were not used to represent the objects that they actually showed. In Fred's picture (figure 6.15), the stickers of pins represent raindrops but these are then carefully integrated into the physical organisation of the canvas, falling from the clouds at the top of the page.

Figure 6.14 Jasmeen's picture, Session 2



At other times, stickers were more haphazard in their placement and this made it difficult to 'read' meaningful relations. For example, in Fatima's picture (figure 6.16), a sticker of a bag is incorporated. This might be a bag belonging to the figure shown in the picture, but the placement of the bag, on its side and slightly away from the figure, make it difficult to be sure that this was the relation being demonstrated.

Figure 6.15 Fred's picture, Session 2

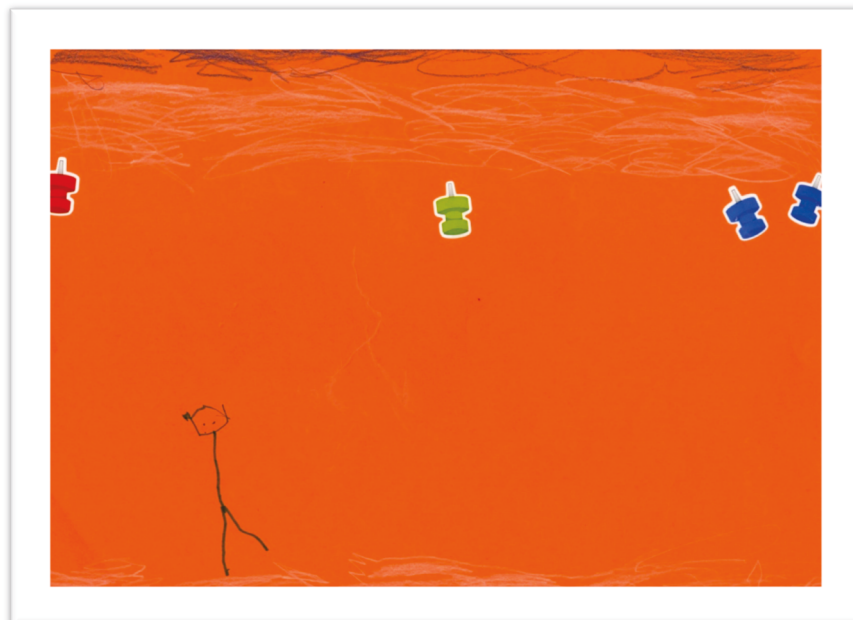
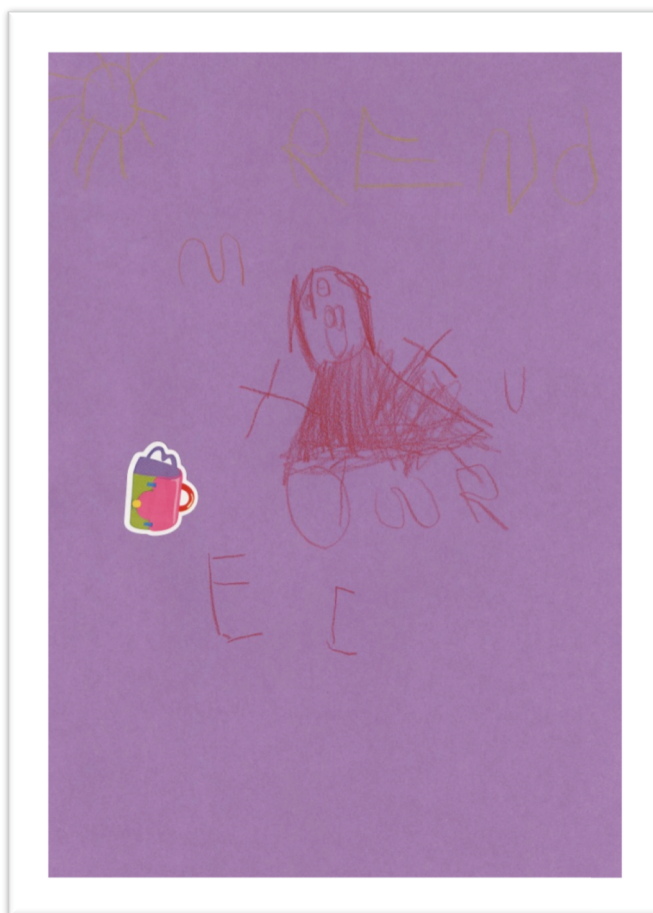


Figure 6.16 Fatima's picture, Session 2



6.3.1.6 Image use

The ready-made images available in this session were an integral and exciting part of the semiotic resources used by children to make meaning. The importance of ready-made images is clear given that some pictures made in this session used stickers exclusively (e.g. figure 6.9). Stickers carried two types of meaning in these pictures: children could make use of the representational content of the image, or could focus on the visual impression of the sticker. In Gabriela's picture (figure 6.17), stickers are used to represent hair clips (contributing to the referential dimension of the picture) but also to 'colour in' the dress

and frame the picture by their placement in the corners of the picture (contributing to the aesthetic dimension).

Figure 6.17 Gabriela's picture, Session 2



As mentioned in the previous section, the visual tension between different types of media (the stickers and the drawn images) created a distinct impression of flux. The impression of dynamism either appeared to cluster around the sticker image or the drawn image. In Caspian's picture (figure 6.13), it is the sticker of the vehicle in profile that appears to be moving. In Ali's picture (figure 6.11) on the other hand, the sticker is the least dynamic part of the picture: the drawn images demonstrate flux, while the image of the boy is distinctly static in comparison. Another source of tension between the different types of media occurs as a result of the incongruent size of the ready-made and drawn images. In Lexi's picture (figure 6.18), the sticker of a ruler is almost the same size as the figures in the picture. As a result, she creates a reality in which this is possible. She describes the stickers as tape measures and explains that the figures in her picture are measuring themselves.

Figure 6.18 Lexi's picture, Session 2



6.3.2 Overview of screen pictures

The computer group used the semiotic resources offered by the laptop, mouse and the software *tuxpaint* in their picture-making. These resources led to a distinct pattern of picture-making that showed some similarities and many differences to paper picture-making. A similar range of colours was used as in the paper picture-making, but colour choices were less related to the referential content of the picture. Colour was still important but became an aesthetic rather than a referential tool. This shift was mirrored by changes in the physical organisation of the canvas. While balanced composition was present in

the majority of pictures, this was typically achieved through complete fill of the screen rather than other types of spatial arrangement. Space was not used to represent physical or social relationships, but instead to create a striking aesthetic impression. The visual relationships between objects in screen pictures was also different: overlapping was common and the visual integrity of individual pictorial elements was often compromised. These changes suggest that picture-making on screen was ordered according to different principles, which prioritised the aesthetic over the referential dimension.

6.3.2.1 Colour range

The range of colours used by children in this group was zero to eight, and the mean number of colours used was 2.83. The mean and range of colours used were both positively influenced by certain individuals who paid a lot of attention to the use of varied colour in their picture-making. For example, Georgia's picture (figure 6.19) included the use of eight carefully chosen colours. As with the paper picture-making, the background and ready-made images contributed to the colourful effect of the pictures and may have reduced the need for colour to be applied via the 'paintbrush' tool.

Figure 6.19 Georgia's picture, Session 2



6.3.2.2 Colour choice

There was little evidence of structured colour use among members of this group, either through realism or subjective associations between colour and content. Associations between colour and content were far less likely because a greater proportion of the pictures contained abstract or indeterminable content. As a result, colour appeared to be chosen as a result of personal preferences for that colour or for visual effect. Choices of this kind can be seen in Georgia's picture (figure 6.19) and Nina's picture (figure 6.20). In the latter example, two sets of colour are applied from complementary sides of the colour wheel: pink/red and green. The background comprises these two colour spectra, as does the ready-made images of the apples (in red and green) and the strawberries (which contain both red and green). The picture possesses visual unity as a result of these colour patterns, but

only a single colour (green) has been applied with the 'paintbrush' tool and this is unrelated to the referential content. This example demonstrates the necessity of envisaging colour choices beyond reference, where relationships between colours are meaningful in themselves without a relationship to content existing. This encourages us to widen how we think about meaning-making in the context of children's picture-making, so that we consider aesthetic choices as well as referential 'work'.

Figure 6.20 Nina's picture, Session 2



6.3.2.3 Balance

An impression of balance was created in the same proportion of screen pictures as in the paper pictures (12/18). There was less variety however, in how this sense of balance was achieved. It was typically achieved through complete fill of the screen. This is likely to be a result of how quickly the entire screen fills during screen picture-making.

There were only a few examples of a conventional landscape arrangement in which a groundline was used, and other visual pathways (distinct from scattering the pictorial elements randomly) were not visible among the screen pictures. There are competing explanations for this. It may be that the shift to the aesthetic dimension (as discussed in the previous section) led to the production of balanced composition for its own sake, without the presence of conventional visual pathways and spatial arrangements. Alternatively, this composition may not have been carefully planned (hence the lack of identifiable visual pathways) and balance was simply the default product of children tending to fill the entire screen with visual information.

6.3.2.4 Spatial arrangement

As described above, objects were most often scattered across the canvas. The proximity of pictorial elements was not indicative of either physical or social relationships. However, as with colour, this does not necessarily mean that the physical organisation of the canvas carried no meaning in screen picture-making. In Nina's picture (figure 6.20), the two large strawberry images are placed in parallel to one another, and the smaller apple images are used to decorate the surrounding space. There is no impression of a particular visual pathway; the objects are scattered, but scattered purposefully across space so that the objects do not overlap with one another and the overall effect is balanced. Similarly, in Georgia's abstract experimentation with colour, there are a series of parallel lines that create patterns in the physical organisation of space. I have picked these patterns out in figure 6.21, in order to show how these principles have been used. In Seb's picture (figure 6.22), multiple sets of random images are positioned across the page on a background of various colours applied using the 'paintbrush' tool.

This leads to an impression of layering, which in turn builds a sense of depth but not in the manner of a conventional landscape. These examples again suggest the potential for prioritizing an aesthetic impression in spatial arrangement rather than focusing on the representation of discernible or coherent content. The pictures possess visual coherence without representing a known reality.

Figure 6.21 Georgia's picture with parallel lines, Session 2



Figure 6.22 Seb's picture, Session 2



6.3.2.5 Object relations

Children in the computer group showed little concern for the visual integrity of objects and overlapping objects was a common phenomenon. When the 'paintbrush' tool was used, colours were placed on top of one another in a similar way to when paint is applied by young children though the material effect was one of layering rather than mixing. When the ready-made images of the 'stamp' tool were used, overlapping was more akin to overwriting. The size of the stamps and the screen meant that the latter was quickly filled and finding a blank space wasn't always feasible. As a result, stamps and marks were often placed on top of each other. In paper picture-making, children tended to steer away from adding visual elements on top of one another because this would stop the picture from looking neat. In screen picture-making, this was not a concern as the application of any

additional visual material created a crisp visual effect, regardless of whether there were pictorial elements underneath. The frequency with which objects were placed on top of each other may also suggest that screen picture-making is more of a process-based activity. That is, children may adopt more of an experimental or practice approach and as a result, be less aware of the visual integrity of each object in their picture.

6.3.2.6 Image use

The use of ready-made images in screen picture-making, as well as the talk that surrounds this use, suggested that the children were aware of the referential content of these images. Their response to this recognition was varied. Some participants strived for referential integration, as in Gertrude's multiple application of the duck image to the pond setting (figure 6.23). Others worked towards thematic unity among the images used, as in Nina's application of thematically related images of apples and strawberries (figure 6.20) but did not relate this to any content added through freehand drawing. Other participants explored the images as if they were objects, responding to the referential content in a fleeting manner and not considering the relationship of this image to other images in the picture. This was seen in Theo's picture-making, and his final picture (figure 6.24) is indicative of the referential discontinuity in subject matter between the images that were placed on the screen canvas and then quickly removed. In the picture it is possible to see part of the image of a plaster and a saucepan, neither of which have been fully erased. In this example of picture-making, neither the referential or aesthetic dimension were prioritised. Instead, the rapid addition and removal of unrelated images was a form of experimentation with the tools available. In contrast, as in Seb's picture (figure 6.22), the aesthetic impression of the images was

sometimes prioritised over their referential content. Thus, Seb may have recognised the images he used as toy ducks, nutcrackers and jugs, but this was unimportant in his application of the images to the screen canvas.

Figure 6.23 Gertrude's picture, Session 2

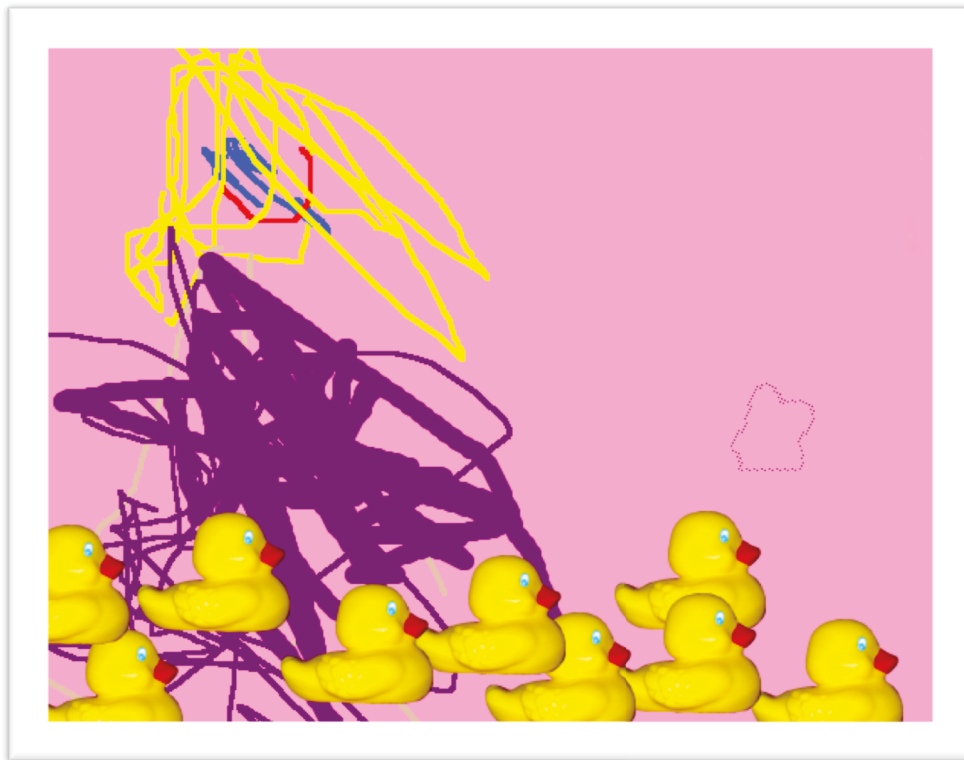
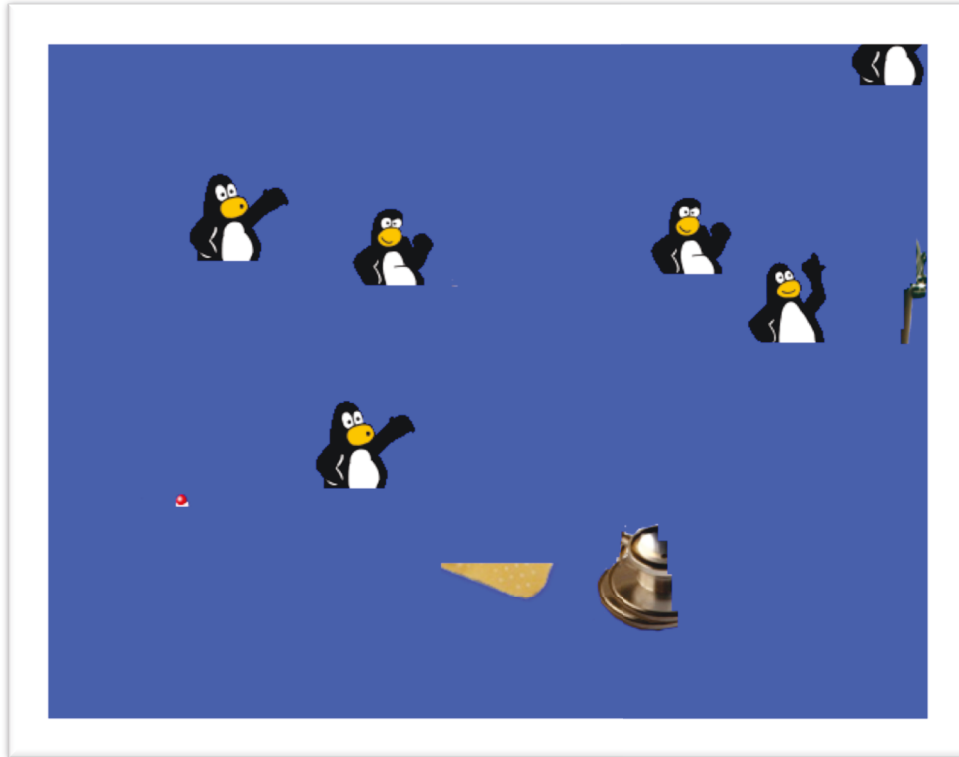


Figure 6.24 Theo's picture, Session 2



6.4 Overview of comparisons

While the range of colours used was equivalent in paper and screen picture-making, colour choice on screen was less linked to the referential content of the picture. Balance was achieved to the same degree in both media, but on screen this was more likely to be the result of complete fill. On paper, a range of spatial arrangements such as the conventional landscape with a groundline were common, but these did not occur when children were making pictures on screen. On paper, respect was shown for the visual integrity of distinct pictorial elements. It was uncommon for drawn images or stickers to overlap, though when both media were used, they were more likely to overlap with each other. In contrast, the screen canvas was likely to contain overlapping marks and images. Ready-made images in both media were recognised for what they represented but could be applied with

more or less regard for subject matter. Images could be used in experimentation or to create an aesthetic impression and this was more often the case in screen picture-making. As with the comparisons of content between media, comparisons of composition suggest that screen picture-making does not foreground the referential dimension to the same extent as paper picture-making. However, while these comparisons, as in the previous chapter, suggest the importance of the experimental dimension, they also suggest that screen picture-making encouraged children to pay attention to the aesthetic impression of their pictures.

Collectively, these differences suggest two underlying shifts in the approach children take when they make pictures on screen as opposed to on paper. Firstly, the referential dimension appears to be less of a priority when children make pictures on screen. This is suggested by the way that colour is used and the positioning of pictorial elements according to aesthetic rather than referential principles. Secondly, screen picture-making is more of a process-based phenomenon, in which children are less concerned with the finished product. As a result, they are less aware of the visual integrity of different objects, and are more likely to experiment with abstract forms and images that show no thematic unity. While there are some exceptions in the data I collected, screen picture-making generally prioritized the aesthetic and experimental dimension of picture-making, while paper picture-making was approached as an activity that would lead to a representational product, thereby prioritizing the referential dimension. This difference had repercussions for the distinct visual impression created when either set of semiotic resources was used.

6.5 Affordances of screen picture-making

There are two shifts underlying the difference between young children's composition in paper and screen picture-making: the shift of focus from the referential to the aesthetic dimension of picture-making, and the shift of focus from the referential to the experimental dimension of picture-making. In order to explain these shifts it is necessary to consider both the social construction of the medium being used and its material properties. Below, I consider these in relation to the compositional aspects that manifest differently depending on the medium being used: colour, spatial arrangement, object boundaries and the use of ready-made images.

6.5.1 Colour

Why was colour less likely to be linked to content when it was applied in the context of screen picture-making? In previous literature, the development of colour use as children grow older has been understood as an increasing shift towards realism (Golomb and Farmer, 1983). Such research suggests that by 4-5 years of age, children are beginning to consistently link content with the colours they are using in their paper pictures. However, the realistic portrayal of content is not materially possible in the context of screen picture-making with *tuxpaint*. While the ready-made images that can be applied in *tuxpaint* are often realistic in terms of colour, the sizes of the images when they are stamped onto the screen are incongruent and this makes realistic representations difficult to produce. In Nina's picture for example (figure 6.20), the strawberries she chose from the image bank were far bigger than the apples she placed on screen. There were similar experiences among all of the children who chose to apply images when using *tuxpaint*. As a result of these size mismatches (or what I describe as

'referential rule-breaking'), children were unable to produce realistic representations, and may have responded by being less interested in realistic links between colour and content.

Another reason for the lack of realism in colour use on screen was the abstract nature of much of the visual content that children created in screen picture-making. The marks that they made with the 'paintbrush' tool often appeared to be non-referential. Of course, it is possible that while they appeared abstract to me as a viewer, they were in fact related to content that existed in the child's mind (Gardner, 1980). However, it was not only the texts, but also the talk surrounding the texts, which suggested that much of the content produced by children in their screen picture-making was abstract in nature. The representation of everyday content may have been more difficult for children when using the computer as a result of mouse manipulation and the constraints that this creates (Matthews & Seow, 2007; Matthews & Jessel, 1993). Alternatively, there may have been an attraction to abstract picture-making because it enabled them to prioritise potential dimensions of picture-making that are often neglected in paper picture-making (e.g. the aesthetic or experimental dimension). Georgia's picture (figure 6.19) is an example of the startling visual effect that can be created when colour is used as a tool in design, rather than a way of creating more realistic representations.

In much of the literature on children's picture-making, the referential dimension and ultimately realism have been presented as the 'neutral' approach (Kolbe, 2005). The perceived neutrality of realistic representations has been noted by Chandler (2007), who argues that even among adults, realism frames our notions of what a picture is even though it is as much of a social construction as abstract picture-making. The perceived neutrality of realism is unsettled when a medium is introduced that does not follow these rules. I have already mentioned

that the size mismatches caused by image use in *tuxpaint* undermine the principles of realistic representation, and as a result, make realistic colour use among children less likely. There is also a social dimension to this shift. Since there are fewer expectations surrounding text-making via the screen medium (Labbo, 1996), the dominance of realism is likely to be less influential on the way children make pictures on screen. In this research, the expectations that surrounded screen picture-making were constructed mostly through my input, which focused on experimenting with the tools available, and through experiences of the screen that children had outside of the classroom, which are most likely to involve game-playing rather than the creation of realistic representations (Orleans & Laney, 2000; Burnett, 2010). These differences would help to explain the prevalence of abstract picture-making among members of the computer group, and the weakened relationship between colour and content.

6.5.2 Spatial arrangement

Why were there fewer conventional spatial arrangements present in the context of screen picture-making? When working on screen, children filled the available space much quicker than they did when working on paper. This is the result of tools that enable a large amount of visual material to be placed onto the screen at the single click of a button. The rapidity of this process may have led to less time being spent on the arrangement of content in space. As a result, the children in this group tended to achieve visual balance through a complete fill of the screen. While Burnett and Myers (2006) found digital ready-made material to be applied by children with care, they were not specifically looking at the spatial layout of this material and were instead most concerned with the selection of content. Furthermore, their study took place with children aged 8-9 years old. It is possible that there are significant changes in

children's approach to ready-made digital material between these age groups. In this study, most children covered the entire screen within a short amount of time and then either layered information on top or removed material in order to begin again.

Certain spatial arrangements were made less likely by the material affordances of screen picture-making. For example, landscape arrangements in paper picture-making are typically associated with some attempts to scale the size of objects in relation to one another. In screen picture-making, the latter is unlikely since the ready-made images are not scaled in terms of size. As a result, the children making pictures on screen may have thought that creating a landscape format was impossible or inappropriate. This is supported by the observation that the children who produced landscape formats on screen were also those who tried hard to scale the size of objects in relation to one another. For example, Gertrude applied the duck 'stamp' multiple times in the landscape of a duck pond. When she applied new visual material that was too large or small within this context, she quickly removed it by clicking on the 'undo' button. Even more unlikely than landscape arrangements were topographical representations. These weren't possible if ready-made images were used since none of the latter were representations from above. This highlights the extent to which impressions of spatial arrangement depend on the interpretation of picture content as well as the distribution of elements in physical space. If content is not scaled in terms of size, a landscape impression is unlikely; if content is face-on, a topographical impression is impossible; and if content is thematically disorganised, spatial arrangement is less likely to be perceived as organised.

The final material affordance that needs to be considered in relation to spatial arrangement is the verticality of the screen surface. Children are most used to creating pictures on a horizontal surface. Within this

physical context, spatial relations such as up/down and left/right are connected to a set of physical routines that lead to an immediate impression on the surface. For example, placing visual material in the upper part of the page requires pushing your hand away from you before applying it to the surface. The physical movements for arranging space in a picture on screen are the same since the input device of the mouse is on a horizontal surface. Children may be disorientated however, by the verticality of the environment into which the visual material is appearing. Even though up/down and left/right are the same in paper and screen products of picture-making, the processes involved in navigating these spatial relationships are different. Although I have not been able to find any research on this specific issue, findings by Price et al. (2008) suggests that different types of input-output mappings will lead to different forms of engagement with the technology in use. A physical disassociation between input and output, as in the example of children's screen picture-making, will lead to a particular kind of embodied interaction with the medium (Dourish, 2001). If the physical environment of the activity was constructed differently so that the input and output devices were in the same location (as in the case of paper picture-making or picture-making via a touchscreen device), the patterns of composition might be very different. Further research is required in this area. Observations of children using different types of device in order to make pictures on screen would enable an understanding of how different input-output mappings facilitate distinct types of activity.

6.5.3 Object boundaries

Why was there less respect for object boundaries when pictures were made on screen? Previous studies of drawing have demonstrated that children very rarely cross object boundaries by allowing pictorial

elements to overlap (Cox, 2005). Exceptions to this occur in drawing when children are repeatedly practising some aspect of their drawing, as in Jack's repetition of the human figure schema in his picture from the first session, or when the drawing is incorporated into dramatic play (Anning, 2002, 2003). In both of these situations, children are focused more on the process of drawing than on the product. This suggests that respect for object boundaries is related to the visual impression of the product. Thus, screen picture-making may involve more overlapping of visual material because children are more focused on practising and playing with the tools available than on creating a finished product. This is likely in this study since the children had been less exposed to the tools available in *tuxpaint* and had been introduced to them through an interactive demonstration that placed the emphasis on experimentation.

Furthermore, the material affordances of screen picture-making may support this kind of playful approach. Paper picture-making occurs at a much slower pace than screen picture-making. In the latter activity, children often filled the screen within only a few minutes of beginning their picture. Once the screen was filled, children could either choose to remove material before adding more or they could place material on top of what was already on the screen and cross object boundaries as a result. The children in this study made different choices depending on how important they felt the object boundaries to be. For example, Ben asked: 'But how would I draw if I haven't got any more space?' and then made a decision: 'I'm ripping them all out'. Many of the other participants were happy to place visual material in layers and not only cross object boundaries but cover up entirely the objects underneath. The crisp impression created by placing ready-made images or marks on top of existing visual material on the screen was more appealing than on paper, where drawings placed on top of one another could not fully cover what was underneath and looked 'messy'. This is also suggested by how children positioned stickers in the paper picture-

making, since these were much more likely to cross object boundaries and be placed on top of existing visual material than drawn images. The stickers, like all visual material in *tuxpaint*, created a crisp impression when placed on top of other material on the page.

6.5.4 Image use

Ready-made images were more likely to be applied in a non-referential way when children were making pictures on screen than when they were making pictures on paper. By this I mean that there was less attention paid by children to the subject matter that images represented and fewer attempts to integrate the referential content of different images. There are a number of material affordances that can help to explain this difference. When children made pictures on screen, the images available were not clearly visible until they were placed onto the screen. Prior to this action, the image was only visible through a small thumbnail to the right hand side of the screen and as an outline that hovered above the canvas part of the screen. Children therefore applied images in order to know more about them. This type of application was identifiable through the talk surrounding picture-making. For example, Gertrude applied an image of smoke to the screen before saying: 'I want to take it out. I didn't know what it was'. While Gertrude wanted to remove the image that she had applied in this way, many of the other participants were happy to continue exploring images through application and for the images to then remain on screen. Thus, screen picture-making was sometimes characterised by the application of images without full awareness of what they represented or the desire to integrate these images into a coherent referential product.

The application of images on screen was an appealing activity in itself. Although Burnett and Myers (2006) found that most images were

applied with care by 8-9 year olds in their screen text-making, they did note some examples of children being unable to rationalise the act of application other than to say that it was something they had simply wanted to do. This suggests that the application of ready-made digital material can be a stimulating activity that promotes positive affect among young children. This kind of application was not unique to the screen environment: some participants in this study took a similar kind of pleasure in the application of ready-made images on paper. Two of the participants in the paper group made their pictures using stickers and nothing else, suggesting that this was the activity they found most stimulating. However, on paper, the act of application required more care and time since stickers needed to be peeled from their backing and smoothed onto the paper. In contrast, an image could be applied to the screen with the single click of a button. Thus, the latter environment encouraged children, to a greater extent than on paper, to organise their picture-making around the action of image application.

As well as material affordances, it is important to consider the social factors that may have changed the way that ready-made images were applied when children made pictures on screen. As mentioned previously, the emphasis placed on reference and the assumption that picture-making is fundamentally a referential act, are part of a culture that has developed around children's picture-making (Kolbe, 2005; Schirmacher, 1986). The beliefs and practices that constitute this culture are unsettled when a new medium is introduced (Jewitt & Kress, 2003). The practices that are enacted through this new medium are therefore likely to be less constrained (Labbo, 1996). Thus, the approaches that children took towards screen picture-making comprised greater diversity. While some attempted representations as they would have done on paper, others saw screen picture-making as an opportunity to explore non-referential aspects of the activity. For some children, like Peter, there was a visible shift in their approach to

picture-making while they worked on screen. They began the session with an interest in referential picture-making but as the experience progressed, they explored a greater range of the available tools, and the differences between paper and screen picture-making became increasingly clear. In Peter's picture-making, his interest shifted from the content of the images to their visual manipulation through rotation and enlargement. His interest transferred from the referential content of the images he was applying to how these images could be changed and arranged on screen.

6.6 Conclusions

A visual comparison of composition between paper and screen picture-making revealed important differences in the approach that children take towards composition when using either set of resources. The differences suggest that when children are creating pictures on screen, they are more likely to take a process-based approach and prioritise the experimental dimension over the referential dimension of picture-making. This shift did not however, correspond to a loss of interest in the aesthetic elements of their picture-making. They paid close attention to the colours in their picture and the spatial arrangements of the material they included. Although the pictures that emerged were more likely to be abstract, they comprised motivated signs that took time and effort to produce. The shift I found can be explained through both social and material affordances of the semiotic resources on offer. On a social level, the resources are 'read' in a more open way by children, so that focusing on process rather than product is perceived as more acceptable within this medium. On a material level, certain properties of *tuxpaint* contribute to the compositional shifts described. Firstly, coherent representations were less likely on screen because the images available failed to conform to rules of size congruity. The

referential rule-breaking in the software meant that children in this study were less likely to prioritise realistic and coherent representations. Secondly, the endless layering of visual information that was possible and pleasurable during screen picture-making meant that the children built up visual material in a less inhibited way than when they were working on paper.

Even in the context of experimentation, children often persisted in attention towards the aesthetic elements of their pictures. Indeed, there was a heightened awareness for colour and the visual effects created by different tools available in the software. This suggests that the conversations between practitioners and children that surround screen picture-making could have a different focus to those that typically occur in relation to paper picture-making. Rather than focusing on the content of the representation, discussions could centre on the manner of the representation. By this I mean that children's interest in the tools available in screen picture-making could be seen by practitioners as an opportunity to develop their understanding of composition and design. Talking openly about the visual effects created by the different tools on offer and how we as readers (in the sense of Kress, 2003) respond to these effects is a way for young children to become empowered users of the medium. Similarly, allowing children to talk about the ready-made images that are available in the medium and why these are simultaneously exciting and limiting, draws their attention to the opportunities and constraints of the medium. Speaking in an explicit way about the medium will enable them to make informed decisions about the representations they create and the wider context in which their decisions are situated. It makes sense for discussions surrounding screen picture-making to have this type of non-referential focus (as well as a referential focus when appropriate) because children typically create non-referential texts when they make pictures on screen. Having said this, classroom discussions around paper picture-making would

also benefit from a shift in this direction. By focusing solely on what children are representing in their pictures, we are missing an opportunity to engage them in discussions about the processes of text-making and the interpretation of texts; we are suggesting to them that the medium is a neutral vehicle for their intended meanings, rather than a socio-cultural product with implications for the types of text they make.

Chapter 7

Narrative in picture-making on page and screen

7.1 Introduction

The analysis in this chapter relates to two of my research questions:

RQ1: How is children's screen picture-making similar/different to their paper picture-making?

RQ2: What are the distinct affordances of screen picture-making?

It considers these questions in terms of the narratives that accompany children's pictures and the affordances that guide the development of narrative in screen picture-making. In analyses of content and composition, I explored both the picture products and the talk of 36 4-5 year olds as they made pictures using different media. In analysing the talk that surrounded picture-making, I started to reflect on the part that pictorial representation could play in wider processes of children's thought and play (Anning, 2003; Frisch, 2006). In order to develop these reflections, I focused on one particular kind of talk with which the children in this study sometimes engaged while making pictures: narrative talk. In this chapter, the analytical focus is on examples of picture-making that demonstrate a relationship with narrative and what these examples can tell us about the influence of screen media on picture-making.

As in the previous chapters of analysis, the primary focus will be on a comparison of picture-making in the second session between the two groups: paper and screen. Prior to this comparison, findings from the first session of picture-making were explored alongside relevant literature in the field in order to establish feasible analytical categories. Having established these categories, I then compared the use of

narrative in the second episode between participants of the paper group and participants in the computer group. In order to explain differences in the role of narrative within each medium, I used the notion of affordances. In the discussions that follow the comparisons in this chapter, I will discuss the material and social affordances at work in screen picture-making and how these inspire certain types and aspects of narrative and inhibit others.

Narrative is not present in all examples of picture-making. The inclusion of at least one narrative fragment of talk in a session of picture-making occurred in, on average, one third of examples (see the methodology chapter for an explanation of how I identified narrative fragments). Thus, I must be careful about generalizing since the findings outlined here rely on a smaller group of participants: eight participants in the paper group and four participants in the computer group. Having said this, focusing on a small sample allowed me to develop a finer-grained analysis with conclusions and comparisons that were supported by the in-depth interpretation of specific cases. By adopting a case study approach, I was building upon a rich tradition of case studies into children's text-making. In particular, the work of Mavers (2007) suggests that much can be learned about the affordances of a set of semiotic resources by exploring specific occasions of use.

7.2 Establishing Analytical Categories

Following a review of the literature, I decided to focus on three analytical categories in my exploration of narrative: types of narrative; characterisation; and scene-setting. In order to understand these categories in more depth and what I was likely to find in examples from the second session, I applied them to examples of narrative talk produced during the first session of picture-making. I did not however,

produce any detailed case studies based on data from the first session, but applied the categories in a more general way. In the first session, ten participants produced talk that suggested the presence of narrative. While some produced only a single talk fragment that was categorised as an example of narrative talk, others fully integrated narrative structures and devices into their picture-making. In the discussion below, I consider both literature and findings from the first session in relation to the three categories; this will provide a backdrop for the more complicated analyses of the second episode of picture-making in which medium was the primary variable.

7.2.1 Types of narrative

The 16 types of narrative described by Preece (1987) were used as a starting point for classifying narrative talk produced in the first session. The type of narrative used by participants in the first session ranged from the relaying of personal anecdotes to the development of imaginary fantasies. While in Preece's research, narrative was most often anecdotal and examples of original fantasies were rare, my findings from the first session demonstrated greater diversity in narrative types. Of the ten participants to produce narrative, five recounted everyday experiences and five produced narratives that relied on imaginary events or characters. The even division between everyday and imaginary content in this study may be the result of narrative being an accompaniment to picture-making since picture-making as an activity has been shown to comprise both everyday and imaginary content (Thompson, 1999, 2003).

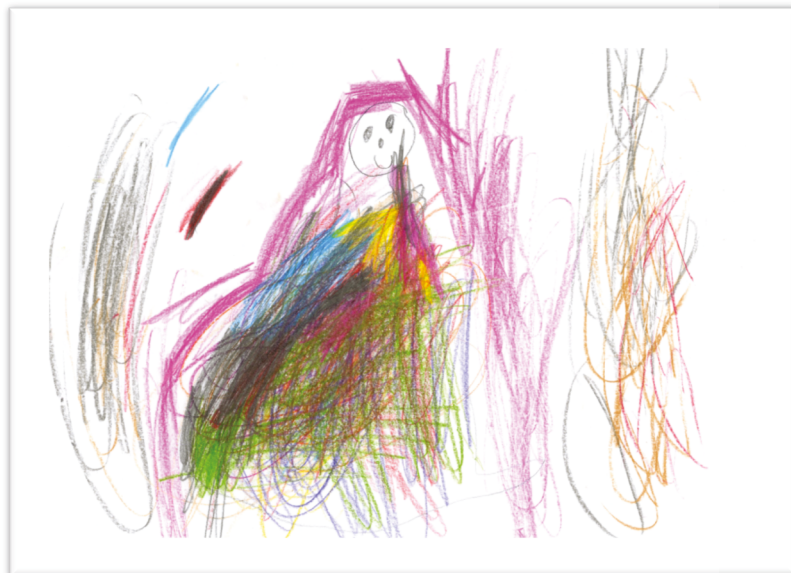
The five imaginary or fantastical narrative examples could be divided roughly into two groups. In the first group, narrative was dependent on the depiction of imaginary characters. For example, Caspian depicted a

knight (figure 7.1) and Tammy depicted a princess (figure 7.2). There was no suggestion from the participants' talk that these characters were in the midst of action or in a state of flux. The identification of narrative depended simply on the borrowing of static narrative material from other sources – in this case, characters drawn from popular fictional texts.

Figure 7.1 Caspian's picture, Session 1



Figure 7.2 Tammy's picture, Session 1



In contrast, the other participants to produce an imaginary narrative created extended narratives around objects acting and interacting on the page. Members of this group all began their pictures as diagrammatic representations of objects and then positioned these objects within narrative. For example, Joshua's picture (figure 7.3) began with the careful depiction and description of a toy digger: 'This is a kind of digger. But it's a bit different from the other digger... It has so many scoops to go across'. As the session continued, the digger became a source of movement and action. Joshua furiously drew circles in an array of colours while explaining: 'These circles are trying to make... are trying to crash into this big digger.. but he's too strong... A big crane is going to get them'. Joshua's picture-making demonstrates how this activity can become part of a wider act of multimodal expression and play. While the role of drawing in dramatic play has been discussed in the work of Anning (2002, 2003), applying a narrative framework to children's pictures and looking systematically for elements of narrative in their talk has not – as far as I know – been attempted previously. The everyday narratives that were produced by children in this session related to experiences in the classroom (e.g. making a gun at the junk modelling table), in the playground (e.g. playing Star Wars) or at home (e.g. being at home with pets).

Figure 7.3 Joshua's picture, Session 1



7.2.2 Characterisation

As well as diversity in the type of narrative constructed, the examples from this session involved different levels of characterisation that could be classified according to the previous research on narrative conducted by Nicolopoulou and Richner (2007). In this study, characterisation was seen in terms of three levels: characters as actors, characters as agents and characters as persons. While actors are described in purely physical terms, agents and persons involve references to mental states and attributes respectively. The fictional characters used by Caspian and Tammy were characters as a result of their associations, but were not a source of narrative action. As a result, they failed to meet the criteria for even the least mentalistic of characters (actors) in the typology of Nicolopoulou and Richner. The remaining examples included characters that conducted or were subject to action. Most often, these characters were described without reference to mental traits and can therefore be described as actors. This finding fits in with previous literature on characterisation, which suggests that the development of characters with mental traits emerges at a later age (Nicolopoulou, 2008). Having said this, there were two instances of characterisation in the first session that involved mention of mental traits. In Daniel's picture-making, he represented himself *choosing* what game to play on the computer, and choosing a particular game on the basis that Anna *liked* that one. In Joshua's depiction of a collision between a toy crane and toy digger, their action was described using intentional verbs such as 'trying to'. These examples suggest, in line with Bruner's research on 'dual consciousness', that evidence of agency in children's characterisation can emerge from a very young age.

7.2.3 Scene-setting

The research of Labbo (1996) highlighted the possible creation of a scene or landscape in children's picture-making. The examples of narrative from the first session demonstrated a spectrum of scene-setting, which ranged from no evidence of scene-setting to explicit and extended scene development. Three participants refrained from grounding their narrative in a particular scene. Five participants did not mention a particular setting explicitly, but there was a degree of implicit scene-setting as a result of the action that they referred to. Thus, when Lexi stated 'That was me when I was off school', the viewer imagines that the action is taking place in Lexi's home. Similarly, Ali's depiction of a scooter and Yusuf's representation of playing Star Wars both make sense in the context of the playground. Gabriela's depiction of the junk modelling table and Daniel's representation of himself on the class computer both suggest the context of the classroom. Some scene-setting was more explicit. Tom, like Yusuf, depicted himself playing Star Wars with his friend. The only difference in scene-setting between these examples was that Tom explicitly stated: 'We're outside playing Star Wars'. In the final example, Alfie was not only explicit, but also developed the scene of the firestation in much finer detail than any of the other participants had developed scenes for the narratives they created. He carefully included a pole, gravity suits, a fire engine and a fireman using the pole. These additions created a strong sense of place and acted as a starting point for narrative action involving a fire and the use of water to put it out.

7.3 Session 2

In the second session, participants were asked to make a picture either on coloured paper using felt-tip pens, coloured pencils and stickers, or

on the computer using the software *tuxpaint*. The analytical categories described in the previous section of this chapter were applied to the talk and texts of each group. In particular, I was interested in the following questions:

- Type of narrative: is narrative imaginary or everyday?
- Characterisation: are characters present and if so, are they 'actors' or 'agents'?
- Scene-setting: are scenes prioritised, and are they implicit or explicit?

In the following sections, I discuss these questions first in relation to the paper pictures and then in relation to the screen pictures created during the second session. Before considering each of these questions individually through case studies, I will provide an overview of my findings when pictures were made with on paper (7.3.1) and on the computer (7.3.2). Following this analysis, I will make explicit comparisons between the pictures created using either medium. In the final section, I consider the material and social affordances associated with screen picture-making that may be responsible for the differences that occurred between media.

7.3.1 Overview of paper pictures

In the second session, 18 participants made pictures using coloured paper, felt-tip pens, coloured pencils and stickers. Of these, eight produced talk that suggested the presence of narrative. This is slightly higher than the proportion of children who used narrative in the first session; this may be a result of children spending longer on the creation of their pictures in the second session and therefore having more opportunity to develop narratives. As with the first session, there was diversity in the types of narrative that were constructed by this group.

As well as diversity in the representation of everyday and imaginary content, there was complexity: often the fantastical and the anecdotal were intertwined. This may have been a more prominent feature in this session compared with the first session because of the increased amount of time children spent making their pictures. Six of the eight narratives contained identifiable characters; of these five were actors, and one was an agent. This echoes the finding from the first session, and again suggests that agency in young children's characterisation, while rare, cannot be ruled out altogether. Furthermore, examples from this part of the study suggest that the distinction between actors and agents needs to be problematised on the basis that it is too dependent on the way children use language, and in particular their use of mentalistic verbs like 'trying to'. All participants in this group grounded their picture in a scene of some kind; three did so explicitly, and the rest achieved a sense of place/time implicitly. In the following sections, I consider these findings in more detail and present case studies to elucidate the points I have made.

7.3.1.1 Types of narrative

The types of narrative suggested by the talk of participants in this session were diverse. As with narratives in the first episode of picture-making, these narratives ranged from personal anecdotes to original fantasies. Unlike the earlier narratives however, the everyday and the imaginary were more interwoven and it was impossible to apply the categorisation criteria in a rigid manner. Two case studies are outlined below in order to demonstrate the diversity of narrative types in this session, but also to highlight the difficulties in drawing a clear distinction between everyday and imaginary narratives.

Tom



When Tom was invited to participate in the picture-making activity, he had just come inside from playing outdoors with his friends. He decided to make this activity the subject of his picture. In the picture shown here, Tom depicted himself playing outside with four named friends. He explained that they were playing 'Bumble Bees' and 'Optimus Prime'. The latter is a fictional character from the television show *Transformers*. Thus, according to the narrative typology of Preece (1987), this narrative has elements of a visual media retelling in addition to the personal anecdotal material. Tom did not begin by using *Optimus Prime* as a character in his narrative; rather, it was his friends embodying this fictional character in an everyday context that drove the narrative initially. However, as his picture developed and his drawing of *Optimus Prime* became more detailed, this character became more of a focus in the picture and it was difficult to tell whether the representation was still of his friends embodying a fictional character, or of the fictional character in an imaginary setting.

Ali



Ali was enthusiastic and driven in his picture-making. He started to create his picture almost as soon as he had taken his seat, and he recounted the details of his picture all the way through its construction. He described a traumatic road accident, but with some fantastical details, such as a snail causing the collision. It was not clear what the source of this narrative was. The strong narrative drive represented in this example relates to two of the fundamental purposes of both young children's picture-making and their use of narrative: the need to make sense of the world, and the need to make sense of inner experience (Malchiodi, 1998). The dialogue I shared with Ali suggested that this was not a collision that he had experienced or witnessed firsthand. However, he was adamant that 'they was reals'. It is possible that Ali saw or heard about these incidents through peers, adults or on television. In re-telling the action he was helping himself to understand the events and make predictions about the cause ('the snail was in the way'). It also enabled him to think about the repercussions of the event: he described the family as going 'up to somewhere else'. It is impossible in this example to draw a distinction between the imaginary and everyday content present in the narrative, since Ali's integration of the narrative material

was – even if fantastical – very much part of his everyday understanding of the world around him.

The case studies above highlight the constant dialogue between children's everyday and imaginary worlds. Aspects of both of these types of experience are likely to be found in the narratives that they create. In the examples from this picture-making, they were almost always woven together. As a result, it is difficult to use the Preece's (1987) typology of narrative to apply rigid classifications to the narratives created. Instead, each picture-making experience can be conceptualised as the integration of external material into an everyday perception or understanding of the world. The external material may be concrete experience, others' anecdotes, or fantastical material from television or books (Thompson, 2003), but the process of sense-making will always constitute an 'everyday' activity and narratives will reflect this.

7.3.1.2 Characterisation

Six of the eight narratives in this group included characters. The two narratives which did not include characters were structured instead around the weather. Five narratives involved actors, that is, characters who produced or were involved in action. A single participant, Lexi, created an agentive character described with reference to mental traits. Previous research suggests that it is untypical for children before the age of eight years to develop characters with agency (Nicolopoulou & Richner, 2007). However, I was aware of agents being present in both this and the previous picture-making session and wanted to consider the dimensions of this phenomenon in more detail. In order to explore the presence of agency, or the externalisation of 'dual consciousness'

(Bruner, 1990), among children of such a young age, I will focus on Lexi's picture-making in the following case study.

Lexi

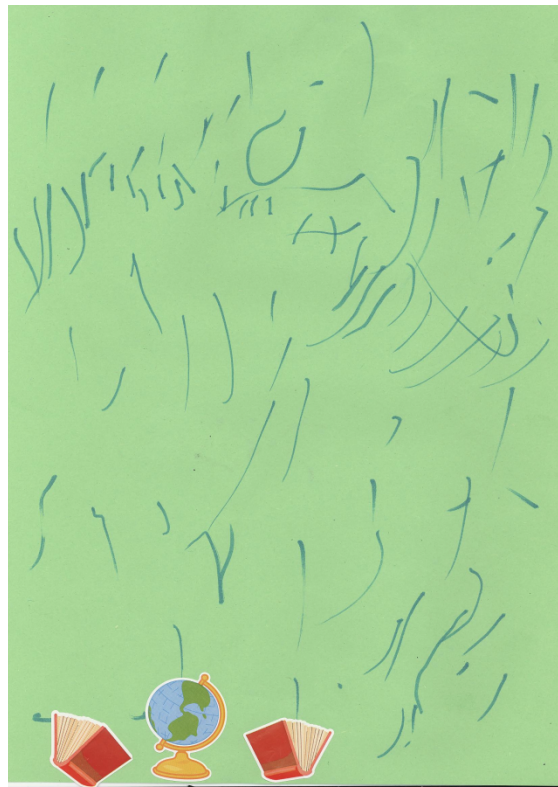


When Lexi was invited to participate in the picture-making task, she agreed only to leave the comfort of the classroom if she could bring along her doll. During the picture-making, she placed this doll on her lap and often referred to her, sometimes as a character in the narrative that she created around her picture. Lexi was the only child to produce a narrative in this session that included characters who were agents as well as actors. Her characters possessed agency as a result of mentalistic traits and processes that she ascribed to them. For example, the younger sister depicted in her picture enacted mental processes ('she thinks'), had emotions ('she is happy') and changed her behaviour as a result of these mental factors ('that's why she's not smiling'). These

fragments of talk, though not occurring within a particularly lengthy narrative, suggest 'dual consciousness' – an awareness that characters possess a consciousness of their own.

As well as challenging the claim that agency in narratives does not develop before the age of 8-9 years old, the data from this study also questions the clarity of the distinction between actor and agent (Nicolopoulou & Richner, 2007). The analysis of my data produced examples that problematize the construct of agency in children's narratives by suggesting it to be overly dependent on linguistic tendencies and capabilities. Verbs such as 'trying' and 'wanting' reference mental states but may simply be used to convey current or imminent action e.g. 'the digger is trying to crash into the crane'. Daniel's narrative around weather, explored further in the following case study, is one example in which mentalistic verbs without it being clear whether agency is present in the characterisation.

Daniel



Daniel drew rain that exploded onto the page amidst indecipherable noises and overwhelming gestural expressiveness. In the outline above, I've chosen not to identify Daniel's rain as a specific character. Despite this, it was described with language that took us closer to agency than other examples that did clearly include characters. For example, Daniel said: 'It's a heavy pour, and it's going to aim at both books.' Is the suggestion of intention in this fragment indicative of actual intention on the part of the rain or is it evidence of Daniel grappling with language in order to convey what he wants it to? His desire to convey not just action, but also imminent action, is supported by the phrase 'it's going to aim' even though he may be aware


that rain cannot aim. This is an example of agency being applied to a non-character. It suggests that we cannot be entirely certain of agency in children's narrative on the basis of language alone; we can only be sure of what a child is able or willing to express about their characters.

While the majority of children in this group produced narratives that contained, as would be expected for this age group, actors, the case studies above demonstrate two important things to consider. Firstly, they suggest that it is possible for children aged only 4-5 years old to refer explicitly to the agency of the characters contained within their narrative. Secondly, they draw attention to the extent to which the distinction between actors and agents is dependent upon the language that children choose to use when conveying narrative. Therefore, the relative lack of agents demonstrated by the talk in this session cannot be used as evidence that children did not conceptualise the characters that they created as agents. Simultaneously, the use of language that suggests agency cannot be taken as firm evidence that characters are conceptualised as agents and narratives constructed with 'dual consciousness' (Bruner, 1990).

7.3.1.3 Scene-setting

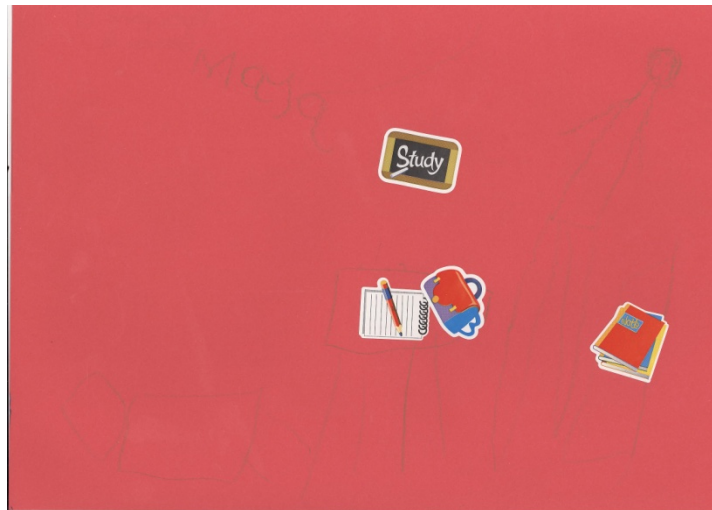
Unlike in the first session, all narrative in this session was grounded in a scene of some kind. Three participants referred explicitly to the scene that they described. The remaining participants did not state explicitly the scene in which their narrative was set, but did build a strong sense of place through implicit cues. The cases I have chosen to focus on in this section are representative of both the explicit and implicit approaches to scene-setting taken by participants. As well as being

distinct in this way, the pictures of Jasmeen and Fred also highlight the diverse ways in which stickers can be used in picture-making and the relationship that this use can have to the construction of narrative and scene-setting. These points develop on the findings regarding image use reported in Chapters 5 and 6.

Fred

<p>Fred represented himself in an implicitly set scene that developed over the course of the session. His picture began with the image of himself. Once the bold outline of this human figure had been achieved, he decided to create a setting around the figure. Although it was not snowing on the day that this picture was created, it was made in the depths of winter and snow had fallen in the last few weeks. Fred stated: 'I like the snow the best' and he engaged readily with this topic of discussion, explaining carefully the activities that he had participated in when it had been snowing. Following and during this conversation, Fred started to build up a sense of place on the canvas. He</p>

drew a layer of snow at the bottom of the page, and two kinds of cloud in the sky – the light clouds from which snow would fall and the dark clouds from which rain would fall. While drawing the dark clouds, he explained that ‘it’s about to rain in my picture’. The imminent rain became actual through Fred’s representation of raindrops through stickers that actually depicted drawing pins. Although Fred never stated explicitly where the figure in his drawing was, scene-setting was an essential part of the narrative he built. It developed over the course of picture-making, rather than being an established part of his picture at the beginning of the session.

Jasmeen



Stating the setting for her narrative was the first thing Jasmeen said about her picture as she was making it. The scene in her picture, a bedroom, was inspired by the ready-made images she chose to use. These included a school bag, books, a notebook and a small chalkboard.

After incorporating these into the scene, Jasmeen began to develop a narrative that could occur in the scene: '...that's the girl's dad...he's seeing if it's tidy...if everything's on the table'. Unlike Fred, who developed the scene of his picture through negotiation and dialogue, Jasmeen began with a scene in the same way that storybooks often lay the scene and then develop action within it. Another distinction between the pictures of Fred and Jasmeen (not unrelated I think to the way in which they developed scene and narrative) is the manner in which they incorporated stickers into their picture. While Fred used stickers at the end of picture-making to represent what he needed them to (raindrops), Jasmeen used stickers at the beginning of picture-making and crafted her scene around the subject matter that these stickers represented.

The case studies above demonstrate the diversity with which children approach the process of scene-setting. While all of the children in this group developed a scene, some did so implicitly and slowly built up a scene over the course of picture-making, while others explicitly referred to a particular place and introduced the scene at the very beginning of the session. Another difference was in the way participants incorporated stickers into their pictures and the relationship that these images had to the scenes they were setting. Stickers could be used to represent something else in order to have a place within the scene (e.g. the raindrops in Fred's picture); alternatively, the images could be used to inspire the development of a particular scene. The approach taken by a child was indicated by the point at which they decided to include the stickers. When they were applied early in the session, they were more

likely to inspire scene-setting. If they were applied in the middle or at the end of the session, they were more likely to be incorporated into the scene already set, and if necessary, used to represent something else that was congruent in the narrative.

7.3.2 Overview of screen pictures

In the second session, 18 participants made pictures using the computer software *tuxpaint*. Of these, four produced talk that suggested the presence of narrative. This is less than the proportion of children who used narrative in the paper picture-making of the first or second session. All of the narratives produced by participants in this group were original fantasies. This is in sharp contrast to the diversity of narrative types seen in the paper picture-making of the first and second session. Imaginary worlds were encouraged by the experimental approach children tended to employ when using the tools offered by *tuxpaint*. Characterisation was far less developed among children making pictures on screen. Only two examples included characters and of these, only one was developed beyond a single indication of their presence. There was no evidence of agency among the characters represented. While characterisation appeared to be inhibited among children working on the computer, the tools available did stimulate innovative and explicit scene-setting. The application of a ready-made image multiple times acted as a starting point for scene-setting in three of the participants' narratives.

7.3.2.1 Types of narrative

All of the examples of narrative in this group are original fantasies. That is, they involve imaginary settings or events that are removed from the

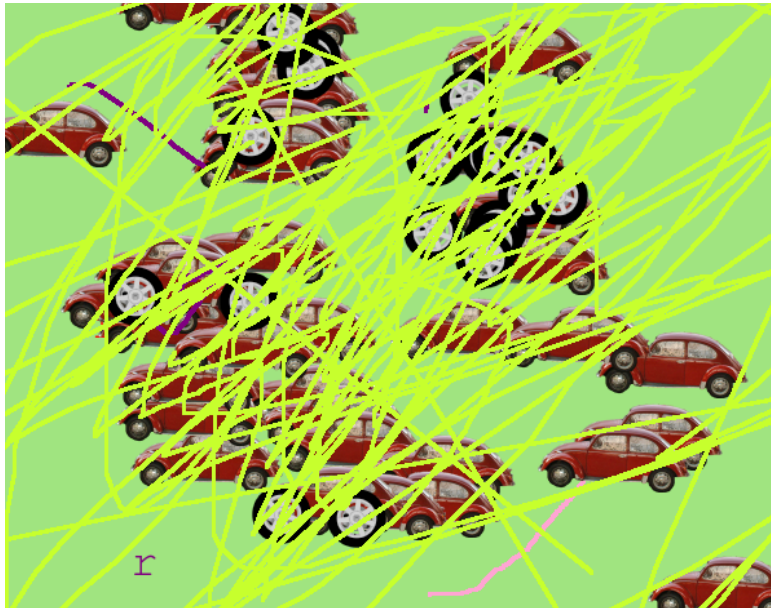
everyday and the anecdotal. The origins of these fantasies appear to belong to one of two categories. On the one hand, Yusuf produced a fantasy that seemed to stem from internal preoccupations. In a similar way to Ali in the paper group, he depicted an imaginary scenario with personal significance, perhaps as a result of stories he had recently been enjoying or creating. He represented, in careful sequence, the setting of a house, the characters of monsters, and the action of the monsters trying to break into the house. On the other hand, all three of the other participants to use narrative in this group developed narrative talk as a response to what was occurring on screen. This is explored further in the table below (table 7.1) and in the case study of Jack's picture-making.

Table 7.1 Narrative talk relating to events on screen

Participant	On-screen event	Subsequent narrative
Jack	<p>The stamp of the car image is used multiple times.</p> <p>The 'paintbrush' tool is used to scribble over the car images.</p>	<p><i>See, these ones are in the car park. And now, these ones are on the car park.</i></p> <p><i>Oh no! The cars are trapped!</i></p> <p><i>Like a net.</i></p> <p><i>They're all trapped behind the net!</i></p>
Gertrude	The stamp of the duck image is used multiple times.	<i>I'm at the duck pond, that's why I'm doing lots of ducks.</i>
Tammy	The stamp of the star	<i>It's the night time.</i>

	image is used multiple times, and then dragged around the screen.	
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Jack



Jack's experience with screen picture-making was based primarily on experimentation. He experimented with the tools available in *tuxpaint* and it was through this experimentation that he arrived at the narrative he created about cars in a car park that become trapped behind a net. He started with the 'stamp' tool and looked through the ready-made images available. Once he had identified an image that resonated with him, a red car, he applied the image multiple times to the screen. He then declared: 'See, these ones are in the car park'. Once these images were on the screen, he changed the tool that he was using to the 'paintbrush' and again the activity on screen became the key driver underlying narrative development – the cars

became trapped behind the net he had drawn with the 'paintbrush'. Thus, the picture-making in this example was inspired by experimentation with the resources available. This helped Jack to represent more imaginative material than in the first session of picture-making, during which he had repeatedly attempted to draw the same human figure.

Picture-making on screen led to a particular form of narrative construction. For the majority of participants in this group, narratives were a consequence of experimentation with the tools available through *tuxpaint*. This finding unsettles further the rigid application of established narrative typologies (e.g. Preece, 1987); it suggests that when narratives are inspired by text-making, and in particular screen picture-making, they may be inspired not by prior personal or imaginary experiences, but instead by current experiments with the properties of the medium.

7.3.2.2 Characterisation

Out of the four participants in this group to produce narrative talk, only two included characters of some kind. Gertrude's narrative, 'I'm at the duck pond', positioned herself as a character, but there were no subsequent references to either real or potential action on this character's part. Yusuf structured his narrative around monsters who demonstrated the potential for behaviour: 'they're going to break the house down'. The other two participants did not include characters in their narratives. The cars in Jack's picture cannot be understood as actors since they caused no action and there was no indication that they were capable of action. Instead they were the subject of action that was not associated with a particular actor: 'the cars are trapped!' In

Tammy's picture, there was a single narrative reference: 'It's the night time'. This is identifiable as narrative because it indicates a scene in which action might occur, but no characters were included. Overall, characterisation among the participants in this group was noticeably under-developed. As mentioned, the exception to this was Yusuf's description of the monsters in his narrative. In the following case study, I suggest that this character development was linked to the approach that Yusuf took towards screen picture-making. This approach was characterised by the careful communication of a narrative through the tools available, as opposed to the construction of a narrative stemming from experimentation with these tools.

Yusuf



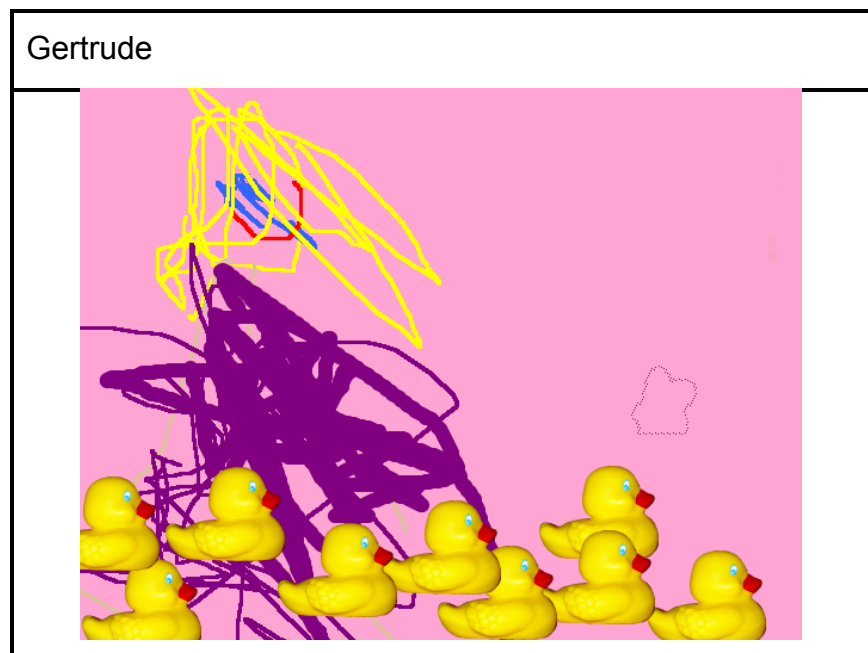
In using *tuxpaint*, Yusuf had little interest in many of the features that engaged the other children in this group. For example, he did not explore the 'stamp' or 'shape' tool. His picture was created through manipulation of a fine-tipped

'paintbrush' in the software that he applied in three colours: black, red and blue. He used the different colours to symbolise different aspects of his picture: the house is depicted in blue, the monsters in red and the black appears to be symbolic of the monsters' attack itself. In the semiotic choices that were made while creating a screen picture, Yusuf demonstrated a single-mindedness in the representation of narrative. He was not distracted by all of the tools that the others used in experimentation. This suggests that the subject matter of his representation was of particular interest to him in and outside of the picture-making experience. Thus, picture-making was a vehicle through which this interest or imaginative process could be expressed. This feature made him distinctive among members of the group whose narratives were inspired by current experimentation with the tools available in *tuxpaint*.

Although further research is required to understand the exact link between experimentation and characterisation, the findings from this study suggest that when children are engaged in experimentation with the tools available, they do not pay as much attention to the development of characters. When making pictures on screen, children are likely to build narratives as a response to their experimentation, but are unlikely to develop characters as part of these narratives. Having said this, experimentation is not an inherent quality of the computer and *tuxpaint* and the example of Yusuf's picture-making demonstrates that it is possible for children to use the screen medium as a vehicle for conveying developed characters. When the experimental as opposed to the referential dimension of picture-making is foregrounded, narratives are unlikely to contain developed characters.

7.3.2.3 Scene-setting

All participants in the computer group explicitly stated the scene in which their narrative was occurring. Furthermore, two of the examples of narrative, presented below as case studies, were categorised as narrative primarily as a result of the scene-setting suggested by the talk of the participants. That is, it was the presence of a scene that led to their classification as narrative pictures, as opposed to other elements of narrative such as plot development or characterisation. Scene-setting is encouraged in screen picture-making partly as a result of the 'stamp' tool which enables children to place ready-made images on the screen. The 'stamp' tool makes it easy for children to use the same image multiple times since copies can be added with the single click of the mouse. The children in this study explained the multiplicity of images on screen through the creation of a setting that would include multiple copies of the same feature or object. This is explored further in the case studies of Gertrude and Tammy, but is also a feature within the picture-making of Jack.



Gertrude began her screen picture by trying to manipulate the 'paintbrush' tool in order to draw herself. She carefully chose colours for her hair, smile, eyes and dress. However, she found the mouse difficult to control and was not satisfied with the drawing of herself: 'I'm trying to do a picture of me but the eyes went a bit wrong'. At this point in the picture-making, Gertrude decided to explore some of the other tools that were available. Once she had identified the 'stamp' tool, she scrolled through the available images and applied them to the screen in order to find out more about them. If they didn't appeal to her, she removed them using the 'eraser' tool. When she found the image of the toy duck, she applied it to the screen and then applied eight copies of the image in quick succession. This process involved tactile pleasure since a single click of the mouse led immediately to the application of a copied image. After stamping the ducks on the canvas, Gertrude declared: 'I'm at the duck pond, that's why I'm doing lots of ducks'. The statement, particularly the second phrase, suggests that Gertrude felt the need to justify the manner in which these ducks had quickly appeared. One way of justifying their presence was to explain them through the narrative device of scene-setting.

Tammy



Tammy's talk as she made her picture on screen was much more related to the tools that were available than the construction of narrative coherence. She wanted to use all of the tools available and flitted back and forth between them, removing and adding visual information at a rapid rate. When she found the star tip for the 'paintbrush' tool, she stamped it onto the page in multiple areas, and then dragged the mouse round until a blurred impression was created. This effect was described by Tammy as 'the night time'. This was the single narrative reference created by Tammy during her picture-making, setting a scene through time rather than place. It was a fleeting idea that was not developed in subsequent picture-making. Tammy then continued to erase and add visual information to the screen.

Tammy, Gertrude and Jack all used the multiple application of the same image as a starting point for narrative, and in particular scene-setting. In order to explain the visual product of their experimentation, they invoked a sense of time or place. Once created, these scenes were either maintained until the end of picture-making (Gertrude), maintained and developed through the presence of action (Jack), or dismantled through further experimentation (Tammy).

7.3.3 Overview of comparisons between paper and screen

In the second session, eight participants in the paper group produced talk that suggested the presence of narrative, while this was true of only four participants in the computer group. While the prevalence of narrative was therefore greater for the paper group, I am not arguing that this is a meaningful difference since a similar discrepancy was present between the two groups in the first session, when the experience and conditions for each group were the same. Thus, there was a difference between the groups in the presence of ‘narrators’ regardless of the medium used. However, by conducting qualitative explorations of the examples of narrative produced by each group in the second session, I have sought to determine whether the affordances of paper and screen media led to distinct types of narrative and narrative development.

The types of narrative in the paper group were diverse. They ranged from personal anecdotes to original fictions and fantasies. All of the narratives related to recent and significant experiences in the children’s lives, so that imaginary and everyday material was often difficult to distinguish. In the examples of imaginary narrative, the elements included in the narrative were still related to experiences that the child had had outside of picture-making, for example, the inclusion of a

character from the television series of *Transformers*. In contrast, all of the narratives accompanying screen picture-making were imaginary, and a majority of participants in the computer group used what was occurring on the screen, the picture-making itself, as a starting point for narrative. The participant in this group that developed an original fantasy that did not respond to what was on screen, did so using the tools that most closely reflected the material affordances of the tools available when using paper (the 'paintbrush' tool in *tuxpaint*). This suggests that when children embrace the wide range of tools available in picture-making software and their distinct affordances, experimentation with these tools can act as the starting point for narrative and lead to different types of narrative.

In the paper group, the majority of narratives relied on actors i.e. characters that can cause action but are not described in terms of mental attributes or processes. Two participants represented action without including actors, and one participant went beyond the behavioural traits of the actor and suggested mental attributes, thereby creating a sense of agency. Characterisation among participants in the computer group was far less developed. Only one example was robust in its inclusion of actors (Yusuf's monsters), and again this was the participant who used the tools in *tuxpaint* that most closely resembled those available when using paper and pencils. Two narratives contained no actors, and the final example involved a minor reference to the positioning of a character. There was no extension of characterisation to agency. The lack of characterisation among members of the computer group was striking and suggests that the types of narrative created on the computer were not suited to (or did not stem from) the inclusion of actors or agents.

In the paper group, half of the narratives involved explicit references to scene-setting and half built a sense of place through implicit visual and

oral clues. In contrast, scene-setting was explicit for all of the participants creating narrative in their screen pictures. References to a scene were not only explicit in these examples; they also occurred as one of the first (and sometimes the only) fragments of narrative talk. For three of these participants, the representation of a scene acted as an entry point into the narrative. The development of a scene was related to the use of the same ready-made image multiple times e.g. a multiplicity of ducks to represent a duck pond. However, while a scene typically marked the beginning of these narratives, it also often marked the end, since there was little narrative development beyond an explicit reference to the scene.

7.4 Affordances of screen picture-making

In this section of the chapter, I will analyse the comparisons outlined above within the framework of affordances. Affordances have both a material and social component, and in the following discussion, I will consider the material properties of *tuxpaint* and the computer, as well as the social associations of screen picture-making that lead to distinct narratives when children engage with this activity. These aspects will be considered through particular examples from my data set, as well as previous literature in the field.

7.4.1 Types of narrative

In the context of screen picture-making, activity occurring on screen inspired narrative as opposed to being illustrative of it. As a result, the narratives created were more likely to be fantastical since they were based on screen activity rather than the personal preoccupations of the child. The speed with which visual elements could be removed from or

added to the screen meant that rapid visual activity occurred before children had planned what they would represent or the narratives they would create. Narrative therefore became a way of justifying what was on screen. The rapidity of activity was partly the result of the 'stamp' tool offered by *tuxpaint* which allows users to apply images onto the screen (and subsequent copies in infinite quantities) at the single click of a button. The multiple application of the same image was a motif seen across the majority of screen pictures made by children in the second session, and a majority of screen pictures that were associated with narrative talk. In the latter group, three of a total four applied the same image in numerous quantities and followed this activity with the partial construction of an original fantasy. The importance of ready-made images and their ready availability within digital media has been recognised by theorists who position the computer as a 'digital remix' medium (Lankshear & Knobel, 2006; Burnett & Myers, 2006), in which users are encouraged to select, rather than painstakingly create, visual or audio material.

But why does the process of image selection more often lead to the construction of imaginary, rather than everyday, narratives? Many of the images available through the 'stamp' tool in *tuxpaint* relate to everyday material. Most of the images are photographs rather than drawings, and they tend to be photographs of common objects, from jugs to plasters to vehicles. Despite this, the children making pictures on screen did not use pictures to convey stories about their everyday life. For example, Jack chose images of a car and a wheel to stamp across the screen in large quantities. He responded positively to these visual stimuli, but did not relate them to his personal life. The cars were never discussed as cars that he had seen, or cars that belonged to family members. Instead, Jack engaged with this subject matter on an abstract level, perhaps as a result of being exposed to similar ready-made images in popular visual media (Thompson, 2003). Similarly

Gertrude and Tammy talked about the images of ducks and stars that they used in general terms, rather than referring to a specific duck pond or night-time sky. The difference in children's relationship to ready-made visual material and material that they construct themselves does not mean that one type of picture-making is more valid than the other (Schiller & Tillett, 2004). Having said this, it does suggest that screen picture-making may be more suitable for certain types of learning and activity, and less suitable for others. As an activity, it may promote imaginative thinking or encourage children to move beyond a 'rut' in their drawn schemata, but simultaneously, it may be a less suitable forum than paper picture-making for a young child's engagement with personal and emotional matters. An art therapist hoping to prompt a child to recount experiences may opt to avoid the presence of ready-made images, as children are less likely to adopt these as representations of aspects of their everyday life. On the other hand, ready-made images may facilitate children to move beyond drawing 'tried-and-tested' schemata that they know to be pleasing to adults and in this respect, they may enable individual children to make pictures that build on their interests and passions. Kapitan (2007) has stressed the need for further exploration of the potential relationship between art therapy and digital media.

As well as material differences between paper and screen picture-making that may lead to more fantastical narratives on screen, there may be social differences that contribute to these kinds of narrative. Based on her ethnographic research with kindergartners, Labbo (1996) suggested that the screen was more likely than paper to be constructed by children as a space for imaginary activity. For example, children were more likely to construct the screen as a landscape or a stage or a playground that would then be inhabited by imaginary characters and fantastical action. The construction of narratives in my study did, to some extent, reflect this pattern. In particular, the construction of the

screen as a car park (Jack) and as a duck pond (Gertrude), suggested that building a landscape was often the starting point of narratives created during screen picture-making. This is certainly possible in paper picture-making also and this was reflected in my data set (e.g. Alfie's careful construction of a firestation on coloured paper), but it is less likely given that the most typical representations included in paper picture-making tend to be objects rather than landscapes, and in particular, emotionally significant humans (Cox, 2005). These tendencies are the result of a culture that has been shaped around children's paper picture-making over hundreds of years and enacted through the communication of expectations that surround the activity. In contrast, screen picture-making is still a relatively new activity with fewer expectations surrounding it; users therefore have more freedom to construct the screen as a space for fantasy rather than everyday representations.

7.4.2 Characterisation

Why was characterisation less developed in the context of screen picture-making? One possibility is that it is much harder to visually capture representations that are likely to be developed into characters (e.g. people, animals and monsters) on screen. I discussed this possibility in Chapter 4 when exploring why fewer human figures were included in children's screen pictures than in their paper pictures. Gertrude described the difficulty of using the mouse to draw a person, and although she persisted in this representation, many other participants in the computer group abandoned their attempts to represent people on screen. As a result, the screen may have offered fewer opportunities to transform a representation into a character. Gertrude's difficulty in using the mouse to draw a person highlights the extent to which the computer as a tool may be 'present-at-hand' rather

than 'ready-to-hand'. This distinction, originally introduced by Heidegger (1962/1927) and since adopted as part of Dourish's (2001) embodied interaction approach, refers to whether a person using a tool is aware of the tool that they are using, or whether the tool has become so embedded in their activity that it is effectively invisible, shifting from 'present-at-hand' to 'ready-to-hand'. A tool can shift back from 'ready-to-hand' to 'present-at-hand' if there is a breakdown in its use that draws attention to it.

Having said this, *tuxpaint* offers a range of ready-made images that could have acted as characters had the children wished to develop them as such. There are pictures of people and animals in the collection of ready-made images available through the 'stamp' tool, and yet these weren't used by the children in this study as a starting point for the development of character. This may be because the images do not entail the same level of choice or personal significance as images that are drawn. Had Yusuf looked for ready-made images to represent the monsters that he included in his picture, it is unlikely that he would have found an image that directly corresponded to his idea of what the monsters should look like. The research of Burnett and Myers (2006) suggests that ready-made digital material may be more suited to inspiring content rather than conveying visual intentions that have already been developed. Furthermore, ready-made images suddenly appear and are imposed as static entities on the screen, while drawn images involve the action of their creation. As a result, the latter may be more associated with the features of a character and in particular, the potential for action.

7.4.3 Scene-setting

In using narrative talk to make sense of what happened on screen, the children in this study focused most often on setting a scene. Narrative scenes were a way of thinking about activity on the screen, especially the sudden multiplicity of the same image. Initial explorations with the tools available and in particular the 'stamp' tool meant that within a few minutes of picture-making, the screen was visually filled. The ease with which ready-made digital material is selected and applied in the context of screen text-making has been highlighted in previous research (Burnett & Myers, 2006). It has played a major role in the suggestion that screen text-making is based on fundamentally different processes and phenomena to paper text-making. Researchers have argued that screen text-making is essentially a process of 'remix' or selection and requires us to re-think the notion of semiotic creativity or design (Lankshear & Knobel, 2006; Kress, 2003; Lamb, 2007). Having said this, my data set did include evidence that children do not always engage with the medium in this way. Thus, Yusuf did not engage with a phase of tool experimentation and did not use a single ready-made image. As a result, his picture-making did not follow the pattern demonstrated in the other examples of picture-making from this session, whereby rapid activity on the screen was followed by scene-setting in order to explain the resulting composition. Instead, Yusuf set the scene orally ('This is my house') and then created the action to occur within it. This was more akin to the process seen among children making their pictures on paper. It is difficult to know the reasons behind Yusuf's departure from the trend seen in screen picture-making in this study generally. It may have been that he was more experienced on the computer and embarked on its use as if it were a 'ready-to-hand' tool (Heidegger, 1962/1927). Alternatively, he may have felt uncertain about many of the tools available and relied heavily on the 'paintbrush' tool since it most closely resembled the tools available when making

pictures on paper. The role of experimentation in different sequences of scene-setting could be explored in further research relative to the familiarity of the medium. Does the presence and process of scene-setting change with increasing exposure to the medium?

The unfamiliarity of the screen medium may have led to more explicit scene-setting as a result of the social, as well as material, affordances that this created. Familiarity comes with expectation. The more familiar a medium is, the more its use will be constrained by previous use and the expectations that have developed as a consequence (Labbo, 1996; Kress & Jewitt, 2003). While paper picture-making is typically associated with static representations, screen picture-making may offer an opportunity for children to explore dynamism across place and time (Labbo, 1996). There is no direct evidence from my study to support the role of wider social constructions of screen and paper in this distinction. There is however, some evidence to suggest that when making pictures on paper, children were more aware of the wider 'audience' that would receive their picture product, than when they were making their pictures on screen. On paper, they enquired about who would see their picture, how the picture would be stored, and whether they could take it home. On screen, no such questions were asked, suggesting that they were not thinking about the products of their picture-making, but were instead focused on the process. Perhaps this suggests that children experience greater freedom in making screen pictures since there is less awareness of reception. Future research could investigate this further by interviewing children about their perceptions of audience in either situation.

7.5 Conclusions

By focusing on the small group of children that used narrative talk while making their pictures in this study, I was able to explore the relationship between narrative and picture-making when the latter occurred in different media. Established taxonomies of narrative were used as a starting point for comparison, but could not be applied too rigidly since they underestimated the extent to which everyday and imaginary material are intertwined in the narratives associated with picture-making. Having said this, there was a clear trend in the data whereby the majority of children making pictures on paper drew inspiration from a wide range of sources in order to build narrative, while children making pictures on screen tended to use the picture-making activity itself as a starting point for narrative. Other differences between media arose in relation to the processes of characterisation and scene-setting. While the characters created during paper picture-making were most often actors, there was a marked lack of character development among children making their pictures on screen. In contrast, scene-setting was more developed among children in the computer group, who made more explicit references to place and time.

I have highlighted a range of material and social affordances to explain the differences between narratives developed in paper and screen picture-making. Activity on screen tended to inspire rather than illustrate narratives. This was partly a result of the rapidity with which screen pictures were typically constructed. Ready-made images were layered onto the screen rapidly and this activity then became the foundation for narratives. The images available in screen picture-making software are different to drawn images in that they are immediate representations of impersonal content. The children in this study did not use images in the software to represent specific people or objects in their everyday life but instead took the images as representations of general ideas or

properties. Thus, it was unlikely that children would use the images to convey everyday experiences and anecdotes. Furthermore, depicting specific objects or people via the 'paintbrush' tool was physically difficult, especially as the computer mouse as a tool was most often 'present-to-hand' and not 'ready-to-hand' (Heidegger, 1962/1927) as a result of its relative novelty, particularly in the school context. Narratives developed in the context of screen picture-making were often used to explain the visual material that had been placed onto the screen. The children used narrative as a tool for justifying the presence of 'empty signifiers' (Barthes, 1977; Derrida, 1980) that had been placed onto the screen without much prior planning. The perception of the need to justify the presence of visual material and activity is the result of an awareness of the immediate audience or the wider 'interpretive community' (Fish, 1980). The children in this study showed less awareness for the reception of their picture products when they were created on screen; while they designed their paper pictures amidst talk of how they would be received, screen picture-making was seen as a process without a distinct product that would be shown to parents and practitioners. This difference is likely to have led to a difference in subject matter and the narrative development involved in paper and screen picture-making.

Chapter 8

Screen picture-making in the classroom

8.1 Introduction

Although the children in my first study made pictures independently, from a social semiotic perspective, children's picture-making must be considered in relation to its social influences and the interactions that surround it (Hodge & Kress, 1988; van Leeuwen, 2005). Previous research findings demonstrate that children's approach to picture-making is shaped by their peers, parents and teachers (Rose et al., 2006; Burkitt et al., 2010). More than fifteen years ago, Labbo (1996) conducted an influential ethnography of young children's screen text-making in the kindergarten classroom. She observed and recorded the conversations of children as they made texts on screen, as well as considering the visual products of this activity. Based on her observations, she argued that children's screen text-making is best understood in terms of various 'worlds' that the children construct through their text-making practices. Depending on the way children engage with text-making, the screen may be constructed as a canvas, a playground, a stage, or a landscape. Labbo's notion of 'worlds' offers an effective way of conceptualizing children's screen picture-making in the classroom and to my knowledge is the only model to have done this so explicitly. But the model needs to be explored further. Are 'worlds' the most productive way to think about children's screen picture-making in the classroom? Do the specific 'worlds' described by Labbo – canvas, stage, playground, landscape – need to be amended or added to? In order to explore these questions further, I conducted a small-scale semiotic ethnography of screen picture-making in a reception class comprising 30 children aged 4-5 years old.

The ethnographic observations from which the data in this chapter is drawn were conducted over four days (Monday to Thursday) in a single setting. In the afternoons of each of these days, a laptop was present in the reception class. It could be used by children as part of their free-flow activity time. If they wished to use the computer in order to make a picture, they could do this as long as they worked within the general rules of the class (e.g. with regards to sharing). Similarly, if they did not wish to use the computer, they did not need to do so. Verbal interactions around the computer were audio-recorded. These were transcribed, and episodes of interest were isolated for closer thematic analysis. Key points in each episode transcript were identified and annotated; these annotations were grouped into larger themes until a point of analytical saturation was reached, that is to say, until all further comment could be organised according to the constructed themes. The construction of these larger themes also involved my understanding of previous literature on this and similar topics, primarily the leading-edge work of Labbo, which I have mentioned. Labbo's 'worlds' model proved to be a productive way to think about the data I had collected, but the data also suggested that certain issues needed to be incorporated into the model: the tensions that exist between 'worlds'; the possibility of additional 'worlds'; the means through which children construct alternative 'worlds'; and the longer-term processes that validate certain 'worlds' and invalidate others. In this chapter, I first present evidence that supports Labbo's 'worlds' as she conceptualised them, and then consider, using evidence from my study, ways in which the model needs to be re-worked and developed.

8.2 Labbo's 'worlds'

As discussed in more detail in Chapter 3, Linda Labbo's (1996) research into children's screen text-making in a kindergarten classroom

was leading-edge in its suggestion that the screen could be constructed in one of multiple ways when children made texts on it. In different episodes of text-making, Labbo witnessed children constructing the screen as a canvas, a playground, a stage and a landscape. Labbo referred to these constructions as 'worlds' and I adopted the same terminology in analysing the findings from my ethnographic observations. There was a wealth of evidence from my study to support the construction of the screen in these different ways. This evidence is presented in the following sections.

8.2.1 Screen as stage

Screen picture-making often took the form of a communication between the principal user and other children who were near to the computer. In such examples, the principal user constructed themselves as an entertainer or director and the children nearby constructed themselves as an audience. The screen became, like a stage or a cinema screen, something to be watched for entertainment. Many of the discussions and negotiations that occurred around the computer were about the organisation of the audience space. This pattern emerged on Monday (episode 2), with frequent demands for more space e.g. 'I want to watch it. Can I have a space?'. This pattern continued throughout the four days. The children complained if their view of the screen was obstructed and made careful recommendations to each other about places from which to see the whole screen.

So what kind of entertainment was the principal user providing? The user was often encouraged by the other children to make things appear on the screen in a comic way. For example, on Wednesday (episode 5) and Thursday (episode 8), the children clustered around Ben as he made images appear and disappear on the screen. They urged him on:

'Ben, click on this, Ben, it will be so funny if you click on this one, click on this one'. When Ben did as they asked, the whole group laughed together. They also made a range of non-linguistic utterances to indicate the noises that the objects on the screen would make or they'd comment on the incongruous size of the objects in order to increase the hilarity: 'Look! It's ginormous!' These episodes are similar to the dramatic play described by Anning (2003) in her research on children's drawing practices. Anning noted that such practices were more typical among boys, and this suggestion was supported by the observations I collected in this study.

In other exchanges, there was a greater sense of narrative coherence to the activity that was unfolding on the screen/stage, and there was less input from the audience surrounding the computer. For example, on Thursday (episode 7), Levi told a story about the images that were on the screen. He placed a penguin on the screen and exclaimed 'There! He's just sitting and relaxing and he's having fun'. The other children present indicated that they were listening and enjoying the story by exclaiming with non-linguistic utterances; this encouraged Levi to continue in the development of the narrative. In all of these examples, the screen was a source of entertainment for the children and the aim of the user was to keep the other children engaged and interested in what was on screen. The principal user constantly looked for social responses to the visual stimuli they placed on screen and listened carefully to what their audience wanted when input was given. These examples of highly social interactions contrast with some teachers' expectations about how children typically engage with the screen medium (Orleans & Laney, 2000; Aubrey & Dahl, 2008).

8.2.2 Screen as playground

As well as providing entertainment, the principal user could communicate with other children nearby in a more playful way. Symbols could be applied by the principal user to the screen in order to communicate specific meanings to a peer nearby. In an example of this from Monday (episode 1), two children were working at the computer – Levi and Katie. Levi, as the principal user, had been working concertedly on a picture representing a narrative about superhero cats. Sitting beside him, Katie repeatedly asked him to put a red love heart onto the screen. Levi initially ignored Katie's pleas but then responded by triumphantly stamping a love heart onto the screen. As he did so, he stated 'I love... that's why I put a love heart there'. After this, they both repeatedly said to each other 'Oh, we love!' and giggled together. Their role play was supported by the symbols available to them (the heart), and the conventional meanings that they both understood this to connote (love and friendship).

At other times, meanings were communicated between users but through unconventional symbols. That is, the children were aware of choices that would have a particular significance for other children near to the screen. This is an example of the 'semiotization' process described by Bjorkvall and Engblom (2010) whereby material resources are given a social meaning through their manipulation and use. This often involved the application of colour, since children were vocal about the colours that they preferred. In an example from Tuesday (episode 1), a group of children were gathered around the computer screen. They made decisions collectively; the children who did not have control of the mouse made constant suggestions about colour and shape. One of the children asked the principal user: 'Could this be some blue for me, because I like blue'. The suggestion was responded to by the user, but also by the other children present around the computer screen who

started to give step-by-step instructions to the principal user about applying blue. These exchanges were a way for the principal user to demonstrate that they were leading a whole-group activity, and they also enabled the secondary users to show active engagement with the process.

Communication did not only occur through the preferences of other individuals near to the computer. The principal user could engage another individual in their decision-making process by asking them to guess what they were drawing or asking them whether they liked their picture. This showed a desire for the process of picture-making to be a social and spontaneous venture, like play. This can be seen in a conversation that I had with Jake on Monday (Episode 5), in which he responded to my question 'What are you drawing?' by saying 'You'll see' and drawing me into a guessing game about what he was representing:

Is it a person?

Yes.

Oh.

But what person do you think it is? My dad
or me?

I think it's your... dad!

No.

Oh, is it you?

Yeah .

These examples all support assertions that text-making on the computer is often a social activity that can encourage conversation

among children (Labbo, 1996; Mercer, 2008). Rather than positioning the screen as a private canvas to be imbued with personal meaning, the children often used the screen as a way of engaging with children that were near to the computer. This was not always the case but it was often the reality and it was not a pattern that lessened over the course of the four days. It suggests that concerns voiced by practitioners in the interviews I have conducted (see Chapter 9) and in the literature about the lack of interaction associated with screen use (e.g. Cordes & Miller, 2000) are not echoed by the practices that occur when a screen is placed into a free-flow classroom setting.

8.2.3 Screen as landscape

As suggested by Labbo, children could use the screen in order to construct a landscape that was then inhabited with action. Before enacting the 'we love' role play, Levi and Katie built a landscape for a narrative involving evil and superhero cats in a flood. The characters in this narrative moved around the screen as if it were a landscape.

There's one evil cat... shall I show which is the evil cat? This one... and he made it flood and all of these cats are running away... because they turned into the jelly flood so he couldn't find them... he run that way and then he looked there and then he was there and then he ran there and then he went there and then he nearly caught that, but they cats are really fast, they ran away, and they're really speedy.

Uh oh.

That one's, that one's chasing that one, but
until, he... he was there and there and there
and there and there and there...

The talk surrounding this narrative demonstrated that it came from a range of sources. It initially stemmed from a visual media retelling, as Levi described how he saw a flood on a television programme, but it was also a consequence (like many of the narratives in Chapter 7) of what was occurring on screen. This supports the assertion of Nicolopoulou (2008) that children's narratives can be of multiple types simultaneously. The stamp of the cat that Levi and Katie were using had a special material quality that facilitated representations of landscapes and physical action. When it was stamped across the screen, the positioning of the cat image changed – the first stamp may have been the profile of a cat running, but the next could be a picture of a cat sitting still. Thus, stamping the image across the screen created a visual impression of flux that was justified by the users through the development of a narrative involving this movement.

As well as the whole screen being constructed as a landscape, images could be substituted for objects in the landscape. In the following exchange from Thursday (episode 2), Bea found the image of a rabbit and stamped this onto the screen. She talked about the picture of the rabbit as you would a real rabbit, describing the rabbits as 'lovely' to her friend. In this scenario, the picture became an element in a type of role play where the children reacted to the picture in the way they would towards the actual object. Again, this reflects some of the children's work in their independent use of *tuxpaint*, where the objects on screen were treated as objects being pulled out of a box, examined, and then either put back or incorporated into play.

Look, look, look.

Awwww.

Look, these are like... lovely. Lacey, look at the rabbits, aren't they lovely?

You could do it all rabbits.

I am.

The same attitude was taken by Jake later on Thursday (episode 8), when he responded to the images of cake on screen.

Yum yum yum, these cakes are delicious!

8.2.4 Screen as canvas

When Labbo explained that sometimes the screen was used as a canvas, she was comparing the practices she saw on screen to those that are expected in the context of drawing on paper. At the drawing table in the classroom I observed children (typically girls) producing pictures of their mothers or other emotionally significant others. This pattern of picture-making was sometimes replicated when children were making pictures on screen, although this was not the dominant pattern of expression. On Wednesday (episode 3), Aysha talked through the process of creating a representation of her mother on the computer and produced an image similar to what she would have produced had she been working on paper (figure 8.1).

How are you going to make your mum Aysha?

Now we're on white, but she's got a white face...white, white...

She's having brown.

My mummy has black just like mine.

My mummy's got black hair like mine.

It's my mummy I'm making.

Figure 8.1 Aysha's picture



As with paper picture-making, the representation of static stimuli can transition into the representation of stimuli in flux. On Monday (episode 3), a group of girls produced the figure of an unidentified girl, describing 'her lovely smiley mouth and a lovely nose... her lovely hair'. The figure became dynamic when the representation of her hair did not go according to plan and the hair was drawn in the wrong position: 'Look at her messy hair.' As a result, she was given a character trait and described as 'a naughty girl... because she pulled her hair and put it in her face...' In this example, getting it wrong encouraged a static representation of a human figure to develop into a narrative. As well as static and dynamic representations, pictures could be experiments in visual pattern-making. For example, Emma produced multiple pictures

that were based on the careful positioning of ready-made images in symmetrical patterns across the screen.

Within the construction of the screen as canvas, there were a diverse range of practices and approaches that prioritized different dimensions of picture-making: referential, aesthetic, social and experimental. This diversity has been noted previously in research into children's drawing (e.g. Gardner, 1982; Kolbe, 2005). Through ethnographic observations however, it was clear the extent to which the diversity was a source and product of negotiation. That is, there was not a single 'canvas' practice that appeared to be validated while others were invalidated. Instead, children had different ideas about what should occur when picture-making took place on screen, and these ideas were in tension with each other. An interaction on Wednesday (episode 3) demonstrates this tension. Emma and Annabel had been creating a picture based on the careful positioning of ready-made images in symmetrical patterns across the screen. Another child approached the computer and exclaimed: 'That's not even a picture!'. Annabel, defending the practice that she and Emma had been enjoying, explained: 'Yes, it is, it's an art picture isn't it?'. An 'art picture' according to Annabel appeared to be one that prioritized the aesthetic over the referential dimension. Thus, different ways of conceptualising picture-making were evident through the children's interactions with one another, even when these approaches could all be understood through Labbo's 'canvas' metaphor. Perceived boundaries of what constitutes a picture and the practice of picture-making were actively policed by children in the classroom. As suggested by Thorne (1993) in relation to gender identity, the way young children evaluated each others' behaviours was key in the process of defining 'acceptable' and 'unacceptable' screen picture-making in the early years classroom. In the example I have described, Annabel and Emma were verbally attacked by a classmate

for the way that they constructed the activity of picture-making; their rebuttal was based on conjuring an alternative norm: the 'art picture'.

8.3 Additional 'worlds'

The notes and recordings I made during my observations in the classroom suggested that additional 'worlds', not outlined by Labbo (1996), were constructed through the children's screen picture-making over the course of the four days. If we continue to use Labbo's notion of 'worlds', then the world of the laboratory and the world of the workshop are two examples of this. These worlds relate to practices that could not be described by the stage, playground, landscape or canvas metaphors adopted by Labbo, but could be understood through the alternative metaphors of laboratory and workshop. The world of the laboratory is one based on experimentation, while the world of the workshop denotes a focus on tool use and increasing competence with the available tools. In the following sections, these additional 'worlds' are outlined in more detail and through selected examples.

8.3.1 Screen as laboratory

Many of the exchanges described in the previous sections involve finding and applying new tools and material in picture-making. This kind of experimentation was a fundamental part of children's computer use. Some children were more willing than others to experiment and to coach others through experimentation with tools that were available. In an example below from Wednesday (episode 4), two children used the computer together when the classroom was particularly quiet. Many of the other children had decided to go outside. Neither of the children using the computer was an 'expert', that is, they were not children that

had attached themselves to the computer over the last couple of days and developed a high level of competence with the tools available. They had seen others using the computer but had not adopted the role of principal users previously. In the exchange, they talked each other through the decision-making process and sought support in trying new things: 'What shall I press?' 'Shall I press X?'. They used prior general and ICT knowledge in order to navigate what they were doing. For example, they sounded out the first letter of 'pictures' in the hope that it would be a clue as to where to find the tool on the screen (presumably expecting to see the word in writing beside the tool). Their actions actually led them to close *tuxpaint* without realising and to access and apply a screensaver image available for the desktop. This is why one of the children says in the exchange: 'You can only look at the images today'.

I want pictures.

Ok, so, see the 'p...p....pictures'.

P...p... pictures.

Shall I press X?

What shall I draw?

Maybe... No, I see pictures at the bottom.

You're sitting on the wire. Oh dear, oh dear.

We got some time.

Pictures.

Oh dear.

What pictures do you want?

Yes!

Then press X.

(gasps) We can just look at them today.

This episode is of particular interest because it demonstrates the bravery that is necessary in order to try things out on the computer when your knowledge and competence is not secure. It also demonstrates however, the willingness with which children embrace this process, particularly if they are working together. By adopting roles of 'expert' and 'novice', despite neither embodying the state of the former, pairs and groups of children were able to navigate and negotiate the decision-making processes that were involved in using less familiar tools (Willett, 2007). As well as inhabiting these roles, adopting talk relating to the genre of experimentation helped them to establish a situation in which children felt comfortable in conducting the trial and error process. By asking questions like 'What will happen if I do this?' children were giving themselves the freedom to make mistakes and learn through these mistakes. Whether children adopted this type of talk related to the extent to which they engaged with experimentation. Some stayed rigidly within the tools that they understood, for example, using exclusively the 'paintbrush' tool which most closely resembled drawing with a pencil or pen, and their talk was descriptive, outlining the representation that they were making. This distinction between children could relate to an individual difference, or it may relate to the perception that the child had of the screen and what functions of picture-making they thought they should prioritise when working on screen.

8.3.2 Screen as workshop

The intention to master the tools available in *tuxpaint* could lead to complete intellectual and emotional engagement. Dean showed an astonishing level of commitment to parameters of success that were solely about the mastery of tools, and in particular, mouse manipulation. Completely filling the screen with a single colour was an activity that relied on his successful manipulation of the mouse, and he would not participate in other activities until this was achieved. This practice required time, concentration and high levels of repetition. In the following chapter, I will argue that practitioners often see this type of text-making as a developmental step back that counters the mainstream discourse of 'self-expression' (Hawkins, 2002). My observations suggest that this is not the case; constructing the screen as a workshop can lead to mature, organized and fulfilling patterns of activity for children.

8.4 Developing the 'worlds' model

As well as adding new 'worlds' to Labbo's model, my observations suggested that other aspects of the 'worlds' model needed to be questioned or problematised. Firstly, it was not clear in Labbo's study how children constructed the 'world' of use that they wanted to engage in. Related to this, if screen picture-making practices were diverse, how did children 'read' the 'worlds' that other children constructed through their activity? Secondly, Labbo argued that there was more freedom in the way that children constructed screen text-making, as compared with their constructions of paper text-making. However, different constructions of an activity do not co-exist without tension. As mentioned briefly in section 8.2.4, there were tensions between the types of practice that children engaged in and these need to be

understood as a more central part of the 'worlds' model. Related to these tensions is an understanding of how particular children were labelled 'competent' or 'incompetent' by their peers as a result of how they engaged with the screen medium. Finally, Labbo did not discuss how different constructions of the screen would develop as a result of longer-term practices. Although her ethnographic study was conducted over a whole academic year, her paper does not engage with the specific practices that a classroom can adopt in relation to screen picture-making, and how these will influence future constructions of the screen. In the following sections, I discuss each of these points in more detail, using examples from the data set I collected.

8.4.1 Constructing a 'world'

How did children construct the screen as a particular world and how did others 'read' this process in order to know which world was currently being engaged with? Collective schemata – a common pool of popular images and ideas (Thompson, 2003) – were used to create a sense of continuity between different episodes, and could signal the adoption of a particular type of use. For example, narrative motifs that were first used on the Monday (evil cats and jelly floods) were invoked later in the week to signal to other users that the world of the stage was being invoked, and to enable a successful shift into this world of use. One of the most fascinating properties of this narrative was the manner in which it recurred throughout the week. The motifs it contained – flooding, evil cats and superhero cats – were used later on in the week, even when the creators of this narrative were not principal users of the computer. The narrative became a way in which the action on screen could be made sense of, or, in the model put forward by Thompson (2003), part of a collective schema that the children used to order their experiences.

By hearing and adopting the narratives of others, children could better make sense of what was visually occurring in their picture-making. The notion of 'flooding' was used repeatedly by different children to understand the motion of colour across the screen. When it occurred in a bright colour, it was described as a 'jelly flood'; when occurring in white, it was described as a 'snowy flood'. In this way, children were able to talk about visual events that were not similar to visual events that occurred in paper text-making. This new terminology was in conflict with paper-based ways of describing what was going on. For example, on Tuesday (episode 1), one child joined the group of children at the computer and demanded to know why the principal user was scribbling:

Why are you scribbling?

He's not scribbling. He's making... he's making
a blue flood go over that...that dark (laughs).

Is it another jelly flood?

It's a white jelly flood.

It's a snowy flood!

Not all shifts between 'worlds' were intentional. On Monday, Dean was carefully covering the screen in different colours using the paintbrush tool. I was present during this episode and asked Dean whether he might like to see what would happen if he used the stamp tool. He was adamant that he did not want to find out about this or other available tools. However, his rapid movements of the mouse led him to accidentally select the stamp tool, and then the frog stamp, and then to immediately apply this image onto the screen. This event was a complete surprise for Ben and for the other children watching the activity, who began to laugh in response. There was a positive social reaction to this event, and the frog stamp was then dotted purposefully

around the screen by Dean in order to entertain his peers. In this example, Dean transitioned from the world of the workshop to the world of the stage through an exciting accident afforded by the materialities of screen picture-making.

8.4.2 Tensions between ‘worlds’

The construction of one world instead of another was a source of negotiation and tension between children. This tension was visible in episodes where there was disagreement over how involved the secondary users should be in what was produced on screen. While the majority of interactions surrounding the computer screen involved a group, there were attempts by some of the children to assert their independence in the activity. For example, Ella’s turn on the computer on Thursday (episode 1) was characterised by a strong resistance to the wishes of others. The suggestions and demands of other children were countered with: ‘No, just let me do what I’m doing’, and when she was asked to draw something for someone else (in a similar way to Katie asking Levi to draw a love heart) she responded by saying: ‘I’m not going to draw anyone anything. I’m just making my own picture. I’m not making anyone a picture’. This fierce independence can be read in a variety of ways. It is possible that by being entirely independent in this way, she was accruing power among the group of children near to the computer. After all, the computer was a coveted object that she had principal use of and previous studies have shown that there is often reluctance to share computer use in the early years classroom (Heft & Swaminathan, 2002). By excluding others from the process she was engaged with, she was establishing a powerful and dominant presence. On the other hand, Ella may have had different perceptions of what constituted appropriate screen picture-making practices. While many of her classmates understood the screen as a social tool, she may have

understood the process as a fundamentally private act about the representation of personal meanings. In the language of Labbo, the screen may have been constructed by her as a canvas rather than a stage or playground. By wanting to be involved, the other children were not only jeopardising the integrity of her representation, but also preventing her from establishing the privacy necessary for her to portray what she wanted. In this particular classroom, this conceptualisation mirrored the way that paper picture-making as an activity was constructed. In the drawing corner, children tended to work independently on pictures laden with personal and emotional meaning. Most often, drawings were of the children's mothers and talk centred on these emotionally significant figures. Of course, paper picture-making is not always enacted in this way (e.g. Anning, 2003; Wright, 2012), but in this classroom, this was the only type of paper picture-making that I witnessed. Ella may have simply been inserting that reality into her use of the computer in order to make sense of the experience.

For other children, the application of images was a careful and planned act that followed aesthetic principles. Emma chose images on the basis of thematic and visual unity. The images were complementary in colour to the screen background that she had chosen (figures 8.2 and 8.3). She applied the images to the screen in a careful pattern following lines of symmetry, with an image in each corner and in the centre. She was proud of the pictures she created and asked others on Wednesday (episode 1) to appraise what she had made:

Do you like this picture? A butterfly there, a butterfly there, a butterfly there, and a cake in the middle.

As well as showing the picture to others for their approval, she was aware of the images that she had saved in the archive. When closing down the computer on Wednesday (episode 5), she asked me to

access the picture that she had saved previously in order to for her to look at it again. When she did, she exclaimed: 'I love it!'. She became upset when a classmate attempted to work over the picture and approached me to resolve the situation. This incident will be described in more detail in section 8.4.3 but the disagreement needs to be mentioned here because it demonstrates a tension between worlds which emerges when children consider what should happen to their finished pictures. For Emma, prioritizing the aesthetic dimension of picture-making, her finished picture belonged in an untouchable archive to be retrieved for viewing only. Others in the class understood pictures in the archive as a legitimate starting point for future texts or were uninterested in the archival of pictures altogether.

Figure 8.2 Emma's picture (A)



Figure 8.3 Emma's picture (B)



8.4.3 Constructing competence

Other tensions played out through a competence/incompetence discourse that surrounded screen picture-making. From the first appearance of the computer in the classroom, some children positioned themselves as 'experts' in relation to the computer. In introducing the computer, the class teacher had asked for two volunteers to be the first users. One of these, Levi, was very aware of his previous knowledge of the computer and of using similar software. He talked about what worked on his father's computer, and compared this to what occurred when he was using the laptop. He also made comments that explicitly referred to his knowledge, as on Monday for example (episode 1), when he issued a series of instructions for another user: 'Paint any size. You just press...thing, size...and then that makes the size' and then said: 'I easily knew that'. Other individuals confirmed his expert status by

seeking his help. At its most extreme, other users would ask Levi to act as a scribe in their picture-making. He would use the mouse and they would issue instructions about the content of the picture, becoming frustrated if Levi did not follow these instructions and instead allowed his own plans to take over.

As well as reinforcing the 'expert' status of an individual, children had the power to construct other users as 'incompetent'. For example, when Aysha used the computer for the first time (Monday, episode 2) and struggled to manipulate the mouse successfully, other children watching the screen urged her on and became exasperated with the time it took for her to carry out their intentions.

White Aysha! I'll do it. No. You need a white
Aysha...don't we Aysha. Now do it. Aysha! I'll
do it! Aysha!

The reactions of children to these kinds of intervention differed. Aysha persevered with her picture-making and did not respond verbally to others. She also used the computer later on in the week, suggesting that she had not been disheartened by others' comments on her use. On the other hand, Ben showed full awareness of others' users comments on his competence. He repeatedly said 'I can't do it!' so that they would understand that it was skill, rather than intention, that was preventing him from enacting the activity that the group had developed as the aim. This was important because the use that he was engaged with was collective in nature. The computer was set up in an audience and entertainment format, and so Ben needed to show that he was acting in line with the interest of the group.

In the first study that I conducted, children were more likely on paper than screen to construct an identity around their competence or incompetence with the tools. Some of the children were confident in

their paper picture-making, while others were reluctant to make any marks on the page and made comments that suggested that they felt unable to do what they perceived to be required. This identity divide was also visible in my ethnographic observations in that it was a certain group of children within the class that frequented the drawing table. In the time that I observed the class, a large proportion were never seen by me to do any drawing. This does not mean that they necessarily felt incompetent, but it does suggest varying levels of confidence with the activity in the classroom context. Such levels of comfort and subsequent identities were constructed as a result of interactions with others, and in particular, interactions that validate or invalidate a child's participation in an activity (Anning, 1997). The markedly collective nature of screen picture-making in this study suggests these identities may form in relation to screen picture-making quickly, following minimal exposure to the activity in the classroom. In future research, it would be fruitful to follow a whole-class exposure to screen picture-making by observations of independent use to see whether the identities enacted in the latter were reflective of participation (and responses to the participation) in the former.

8.4.4 The validation of 'worlds'

The tensions between the screen as different 'worlds' play out in longer-term processes. I would argue, based on my observations of paper picture-making, that these processes are likely to lead to the narrowing of use so that over time there are more or less dominant constructions of screen picture-making. This process is described by Kress (2003) as the 'force of convention' (p. 154) pressing more heavily over time on a particular mode or medium of expression. In the next section, I explore some of the factors that play a part in the validation of certain 'worlds'. For example, the interactions children and practitioners have around

screen picture-making will influence which constructions of the activity are validated. In the previous section, I mentioned briefly that some children were more possessive than others over the finished pictures they had made. This illustrates the importance of considering how practitioners decide to treat the finished products of screen picture-making: the storage and retrieval of the screen pictures, as well as policies surrounding over-writing. Choices about these matters will validate certain 'worlds' and hinder the construction of others. In the following sections, I consider the conversations practitioners and children had about screen picture-making and the choices that practitioners will need to make around storage, retrieval and over-writing. I will discuss how these practices and decisions relate to the validation of certain worlds and the semiotic activity of screen picture-making becoming more 'fully and finely articulated' (Kress & Jewitt, 2003, p. 2).

8.4.4.1 Conversations between children and practitioners

In this study, interactions between the children and teacher in the classroom surrounding screen picture-making were infrequent. The class teacher entered a brief discussion with the principal user only once during the four days, and no teaching assistants participated in conversations around the computer. In the discussion between teacher and child, the teacher expressed an interest in the tools that were available. In the first instance on Monday (episode 3), she questioned the principal user about what they were trying to achieve and having established that they were painting the screen white using the 'paintbrush' tool, she questioned them about shortcuts: 'Is there a quick way to change it to white?'. In this exchange, which is shown below, the teacher was assuming that the child's aim was to achieve the end-result of an entirely white screen, rather than to complete the process of

making it white gradually; a process the children described to each other as 'flooding'. The teacher showed through their questions that they expected intentions to relate to the product rather than the process.

So what are you making?

I'm just trying to make it white.

You're changing it to white?

I'm changing it to red.

Is there a quick way to change it to white?

Yeah, but that's start over.

Oh! Ok...That's a funny paintbrush... Actually it says 'magic' doesn't it...

Magic! Oh, that's what it is...

In the final part of this exchange, the teacher and principal user were negotiating the appropriate terminology for the available tools. The teacher began by comparing the tool to a paintbrush, describing it as a 'funny paintbrush'. It is 'funny' because rather than transfer pure colour onto the screen, it transfers the colour and an effect onto the screen. There are various effects to choose from, including the impression of bricks or spray paint. The teacher then used the writing underneath the tool to make sense of what it does: 'Actually it says 'magic' doesn't it'. This label is vague in the sense that it fails to provide an insight into what visual effect is created through the use of the tool: the label of 'magic' is an admission by the software designers that there is no equivalent tool when picture-making occurs on paper. The child in this exchange however, took up the term readily exclaiming 'Magic! Oh,

that's what it is...' because it provides a metaphor (albeit a vague one) through which the experience could be understood better.

The quantity and nature of conversations between practitioners and children in this study was influenced by my involvement as a researcher and my presence in the classroom throughout the ethnographic observations. In preparation for the study, I had explained to the class teacher that I was most interested in how children made sense of screen picture-making and that there was no 'right' or 'wrong' way for them to respond to the task. In referring to this openness, I led practitioners to understand that they should not steer children towards particular types of screen picture-making. In practice, this meant that the practitioners avoided interference, and most often avoided interaction around screen picture-making altogether. Other studies, such as Heft and Swaminathan (2002), have found a higher rate of interaction between practitioners and children in relation to computer activities. It is possible that without this type of guidance, conversations between practitioners and children about screen picture-making would occur more frequently. Having said this, previous research has shown that in early years contexts, practitioner support in relation to technologies in the classroom is most like to be 'reactive supervision' (p. 6) rather than proactive and planned intervention (Stephen, 2010). In order to investigate this further, a longer ethnographic study would be required, and practitioners would be given instructions that did not suggest a way that they should (or should not) interact with the children as they make screen pictures. If they were simply told that the interest was in whether screen picture-making offered new opportunities for early learning, the conversations between practitioners and children would likely be more intensive and more revealing about the role that such interactions play in shaping the use of relatively new semiotic resources in the classroom.

8.4.4.2 Archival

On Monday, six pictures were saved. This occurred by chance since whenever a new picture was started, the user was given an option to save the picture that they had previously been working on. Some of the children responded to this query by clicking 'yes'. On Tuesday, I explicitly introduced the idea of saving pictures when working with a couple of children. This idea quickly spread among the children and over the course of the four days, saving pictures became more and more common. The number of saved pictures increased steadily over the course of the four days. On Tuesday, eight pictures were saved; on Wednesday, 15 pictures were saved; and on Thursday, 17 pictures were saved. Despite this, the majority of children did not talk actively about saving or retrieving their pictures; episodes of talk relating to archival were few.

While ownership was not explicitly established by all children, some children demonstrated a keen sense of ownership over the pictures they had created. They recognised their pictures when the archive was opened and laid claim to these, showing an awareness of and memory for what they had previously created. In the exchange below from Tuesday (episode 1), two children who were active users of the computer on Monday – Levi and Dean – were establishing ownership over a picture that was accessed in the archive.

That's the one I did yesterday.

No, I did that one.

No I did that one.

No I did that one actually.

Oh, well, I did do that colour.

Once the tool to save pictures had been introduced, there were examples of both conscious attempts to save work, and conscious attempts to discard work. Some children stated openly that they did not wish to save their picture. Other children, like Emma, showed concern for the product. Emma asked to see her picture when I was packing away the computer on Wednesday, and became upset when another user changed her saved picture. Practitioners will need to decide how to integrate saving practices in the support they offer around screen picture-making. While this is an immediate practical concern in the multimedia classroom, it is a topic that very little research has been conducted in. Will practitioners encourage children to save their pictures or allow each child to decide? If they do the latter, will practitioners show appreciation for children's work by suggesting that it should be saved? Will children have individual folders into which they can save their pictures, or will all pictures be saved together? These decisions will influence whether children prioritise the process or product of screen picture-making, which dimensions of the activity they perceive to be most important, and which 'worlds' they construct through their practices.

8.4.4.3 Retrieval

When children opened the archive of pictures that had been saved, they generally did so by accident. There was no evidence to suggest that retrieving and looking at previous pictures was a favoured social activity, though there were isolated cases where specific individuals wanted to see pictures that they had made in the past. Unlike many of the pictures that are made on paper, the screen pictures made by children were not shown to adults. This may have had a liberating effect on children's attitude towards the activity since they did not need to worry about what adults considered to be appropriate screen picture-

making (Labbo, 1996). This would explain the importance of the social dimension of screen picture-making and why this was popular in a way that was not mirrored by activity at the drawing table. In the future, it would be interesting to explore the possibility that changing the way that the picture products are treated could lead to changes in patterns of use. For example, if pictures were emailed to parents/carers, or if pictures were retrieved collectively during 'carpet time', the picture-making process may become more tailored to these experiences and the referential or aesthetic dimensions of picture-making prioritised.

8.4.4.4 Overwriting

When children did open the saved pictures of other children, an interesting power dynamic was introduced since they could position themselves as in control of the picture that had been produced previously. In this way, Emma, who was immensely proud of her saved work, was taunted by Ella on Thursday (episode 3), when she threatened to cover over Emma's picture so that it would be lost.

I did that one yesterday... I made that one
yesterday, I made that one yesterday.

Did you put these on?

I did that one and that one and that one...

I'm going to take them off.

No! Don't! No! Don't!

I just don't want them.

Don't. I don't like it. Don't take them off.

Don't like it.

Just let me do what I'm doing. Just let me do what I'm doing. And I'm going to put some on...

Don't!

I'm going to put different ones on and they will look nice.

But yesterday... I'm going to cover your picture.

Emma was understandably fretful in this situation and came to find me to ask me to intervene. Luckily, the old saved file had not been overwritten and so Emma's picture was intact and she was easily reassured. This would not always be the case (at least with this software), since the individual who has made the modifications can choose to overwrite the old version with the new version if they wish. It is essential to recognise that this is a potential way in which children can emotionally harass or hurt one another. Pictures on paper are saved in physically discreet areas e.g. individual trays, and this means that children cannot easily access pictures that are not their own. In contrast, the saved images on the computer exist unnamed in a communal folder. These can easily be explored and tampered with without any realisation on the part of other children or the practitioners. On the one hand, this could encourage the practice of digital remix (Knobel and Lankshear, 2008), in which creativity builds constantly on the previous work of others. On the other hand, as demonstrated by the exchange between Emma and Ella, there is a concern that this will become a forum for negative social interactions between classmates. The latter is more likely if the children are thinking about screen pictures in different ways. If there is a mismatch between one child's construction of the screen (for example, as a canvas) and another

child's construction of the screen (for example, as a shared playground), tensions are likely to occur in relation to the practice of over-writing.

8.5 Conclusions

Labbo's (1996) influential 'worlds' model offers a clear starting point for thinking about screen picture-making when it occurs in the context of the early years classroom. It is based on a set of metaphors that open up the semiotic potential of screen picture-making by moving away from the terms we use to talk about paper picture-making. In the model, a wider range of metaphors, from the playground to the stage, are used to make sense of children's text-making activity when it occurs on screen. Through my own ethnographic observations of screen picture-making in a particular early years classroom, I was able to build on the model by adding additional 'worlds' to explain the constructions of the screen enacted by the children in this study. More significantly, I developed the model by positioning the 'worlds' of semiotic activity as being in constant tension with one another. I have argued that when children construct the activity of screen picture-making in a particular way, they are engaging in a contested practice. While Labbo positioned the children in her study as being much more open and tolerant than the practitioners in the classroom, my observations suggest that children have strong views about what a picture is and how it should be made. Many of the conversations that occurred around screen picture-making demonstrated the activity to be a site of contestation among the children in the class. In contrast to Labbo's conceptualization of the practitioners in her study, the teachers and teaching assistants in the class I observed were loathe to interfere with the child-led practices of screen picture-making; it was other children who positioned themselves as semiotic guardians, vehemently suggesting how meaning should be

made in this relatively new context. Children adopted a 'meta-communicative approach' (Samuelsson & Carlsson, 2008, p. 627) about picture-making on screen, and exhibited the critical voice that previous research has credited them with (e.g. Richards, 2003). Having said this, in the longer-term, the validation of certain 'worlds' over others will be a practitioner-led as well as child-led phenomenon. Classroom procedures, for example those surrounding archival and retrieval, will have a vital impact on the way screen picture-making is enacted in the classroom and the extent to which the practices are characterized by diversity and innovation. Further research needs to be conducted in order to find out how longer-term processes in the classroom will validate certain patterns of use and invalidate others.

Chapter 9

Practitioners' conceptualisations of screen picture-making

9.1 Introduction

In observing children as they made pictures on screen both through the experimental comparisons and ethnographic observations, I was aware that they constructed the activity as a result of both material and social affordances. The social affordances were their expectations of what the medium was for and these were a result of interactions with others. For the screen, these expectations were less established since screen picture-making was not a common classroom activity and was not a source of interaction between practitioners and children in the way that paper picture-making was. As the presence of screen picture-making in the classroom grows however, the expectations of practitioners will have an increasing influence on how screen picture-making is constructed and enacted. Practitioners will frame the 'interpretive community' (Fish, 1980; see also Anning, 2003 and Burkitt et al., 2006) through which screen picture-making is shaped. In order to explore the future of screen picture-making in the classroom further, I decided to interview practitioners about their understanding of the activity and its role within early learning. Thus, in this chapter, the focus shifts from the children's creation of screen pictures, to the practitioners' conceptualisations of this activity.

The analysis will focus on data from semi-structured interviews that were conducted with six practitioners. The practitioners I chose to participate in this part of the study were all practitioners in one of the three schools that had been involved in the initial study. Two practitioners from each school participated. They were interviewed about the way they conceptualised screen picture-making and the way that they currently implemented practices in relation to the activity. Practitioners offered a wealth of information on these topics and the

interviews were engaging and lively interactions. Having said this, the conceptualisations of screen picture-making shared here were fledgling since the activity was not a common one within any of the classrooms I visited. Thus, many of the points made by practitioners in relation to screen picture-making were hypothetical or based on predictions of what would happen if the activity were to be integrated more fully. These predictions are fascinating data since they enable us to explore how the activity of screen picture-making is likely to be shaped in the future.

Following the transcription of interviews, I thematically coded practitioners' comments. Key points in each transcript were identified and these were grouped into larger themes until a point of analytical saturation was reached, that is to say, until all further comment could be organised according to the constructed themes (Braun & Clarke, 2006). The construction of these larger themes however, also involved my understanding of previous literature, as well as my knowledge and analysis of the children's picture-making in the first and second study I conducted. These processes led to the creation of twelve themes. However, while these themes were useful for organising the wealth of ideas, opinions and comments put forward, they were insensitive to the diversity in practitioners' approaches towards early learning. The latter is important, since practitioners' opinions about screen picture-making can only really be understood in the context of their thoughts about the early years curriculum more generally. In order to contextualise practitioners' conceptualisations of screen picture-making, I therefore created a series of seven spectrums that could be used in relation both to their understanding of early learning and their conceptualisations of screen picture-making. A position on these spectrums could initially be located in relation to the practitioners' conceptualisations of early years education (i.e. what early learning should involve) and then the same done in relation to the practitioners' comments on screen picture-

making. The following spectrums were created as re-workings of the twelve themes previously mentioned.

1. Sensory experiences/Abstract understanding
2. Physical movement/Static engagement
3. Navigation of a familiar environment/Exploration of an unknown environment
4. Self-expression/Exposure to external stimuli
5. Feeling like a novice/Feeling like an expert
6. Interaction/Independent activity
7. Control/Experimentation

In the following sections, I outline each spectrum and relate it to the interview responses from practitioners. In the discussion section, I apply this approach for each school I gathered data in, and suggest how the spectrums I have developed can be used as a practical tool in schools for more successfully managing the integration of screen picture-making into the early years classroom.

9.2 Sensory experiences/Abstract understanding

Some practitioners conceptualised screen picture-making as an environment in which general learning could occur, while others saw it as an opportunity for specific skills to be developed that would be relevant within that particular context, but would not be relevant outside of it. The latter kind of conceptualisation was often the result of a concern that the screen environment was an abstracted experience for children and did not involve the level of sensory stimulation that children were used to and would most benefit from. Such concerns have been reported in previous literature on practitioners' conceptualisations of screen activities (Haugland, 2000; Plowman & Stephen, 2003). Even the practitioners that were positive about learning that could occur in

screen picture-making were still concerned that the medium was, as MD described, 'slightly removed'.

This offers some things... but I would always weight towards the concrete. I think this kind of removes it slightly... and it makes it clean and dry and tidy. And you know that's not really early years-ish ... we like mess. (MD)

This comment demonstrates clearly the tension between practitioners' conceptualisations of early childhood and the learning it entails, and their conceptualisations of the screen environment, and screen picture-making in particular. The elements of each, which are often materially envisaged, cannot always be reconciled. Thus, the screen was typically conceptualised as a neat, sharp and vertically rigid environment, while early learning was associated by practitioners with messy, fluid and horizontal spaces, which allow for activities to move beyond typical physical boundaries (such as desk edges) and merge.

Another difference between paper and screen picture-making that practitioners highlighted is the immediacy of the effects that occur in either medium. When a child moves a paintbrush loaded with paint over paper, a mark is left behind. In contrast, screen picture-making when enacted through a mouse involves moving an object on a horizontal surface which is left unmarked and as a result, creating a mark on a vertical surface that is some distance away. Practitioners were concerned that this pattern of cause and effect might be difficult for children to interpret and navigate. TU suggested that touch technologies, where the input device is a finger rather than a separate mouse, might be different in this respect. Even then however, the mark that appears on the screen is 'locked away' from further impression and the type of mark left behind is determined by a choice between functions that are positioned on the side of the screen as opposed to through immediate physical choices, such as pressing harder with the

paintbrush. The complexity of this pattern of cause and effect – the physical distance between the causes and effects of mark-making on screen – was identified as a potential source of learning by practitioners, but also as a source of confusion.

It feels to me like it's a less immediate medium for the children than having to mark-make with their hands... it's like another stage between just using a pencil or a paintbrush on paper... I think it's one more causal step up... (TU)

Despite concerns about abstraction in the context of screen picture-making, the practitioners considered certain types of abstract knowledge to be vital benefits of paper picture-making. For example, the practitioners argued that the process of drawing encouraged children to think about the essential features of an object they wished to represent.

If you think about when they draw a car, they kind of go 'well I don't know how to draw a car' and you go 'there's the circles for the wheels'...(FY)

You know, it's that kind of level of what makes it a car...the discussion that might only really happen around drawing it ... (MD)

It is interesting that both of the comments above use the same example as Kress (1997; a young child's drawing of a car) to illustrate how the semiotic choices involved in early pictorial meaning-making relate to the process of understanding the world around you in abstract terms and essential features. Some of the practitioners voiced a concern that the immediacy of representations created through image use in *tuxpaint* was not conducive to this thought process, since images in the software did not need to be constructed through essential features.

I suppose they don't have to think about it as much. They think 'that's a car', rather than 'it's made out of circles'... (GD)

Such a difference had implications for other aspects of the practitioners' conceptualisations, for example, the extent to which they felt that the screen medium encouraged or inhibited intellectual development. Overall, there was a contradiction in the practitioners' opinions whereby screen picture-making was too abstract and yet incapable of producing more abstract types of thought among young children.

9.3 Physical movement/Static engagement

Only one of the practitioners interviewed raised the concern that children's screen picture-making might contribute to a general fixation on the screen. She did suggest however, that this was an important aspect of thinking within the school more generally, and that this concern inhibited the development of ICT use among the children in the school:

We worry - why do we worry, that's a good question - when children get fixated on screens, but there are definitely some children that do and some children will quite happily sit on the computer for as long as you left them. (MD)

As MD discussed this concern, she questioned herself - 'why do we worry, that's a good question' - because she fully recognised that children can also obsess about other non-screen experiences. They can become 'stuck' on one particular role play, or on playing with the water, or on a certain story. Screen activity, whether it's watching television or making pictures on screen, struggles to disassociate itself from this concern despite the way it has embedded itself in the early lives of children (Kenner, 2000; Marsh, 2004). The reasons for this may

stem from the materiality and physical positioning of the screen within the early years classroom. The interactivity of screen picture-making is less visible to practitioners since the products of the activity and many of the processes exist solely within the four sides of the vertical screen. In contrast, paper picture-making happens on horizontal surfaces that are fully integrated within the rest of the classroom and used for a range of other activities. The screen is often rigidly contained – there are limits on the number of children that can access the screen at any one time, it might exist in a physically isolated position in the classroom, the child's back is likely to be to the rest of the class when using the computer, and active play and learning that occurs when children participate in screen use is likely to be less visible as a result. Consequently, the attention paid by children to the screen is more likely to be represented as a 'fixation'. The positioning of the computer in the early years classroom has been an issue among researchers and practitioners for almost two decades; Haugland and Wright (1997) stressed the importance of placing the computer in the middle of the room rather than next to walls, so that everyone in the class could see, access and talk about it.

Some comments from practitioners were positive that on-screen activities could promote involvement and engagement among children. These behaviours were valued by the practitioners and were seen as aims to be worked towards during the reception year:

We would encourage, you know, our aim here, I would say our aim is to get as much kind of focused involvement and engagement in whatever that is for that child... (MD)

I suppose one of the things that we're working on at this age is getting them to sustain concentration for longer and longer. (GD)

If a child is particularly stimulated by computer activities, developing their attention and involvement would be better facilitated by this medium. As with fixation, the notion that children are able to demonstrate higher levels of patience when using the computer might be partly the result of an impression created by the materiality of the computer in the classroom. After all, practitioners are often only aware of how long a child has spent sitting in front of the screen, rather than being aware of the details of their use e.g. how long they spent using one kind of software before switching to another.

Practitioners' conceptualisations and the materialities of the screen interacted with each other. That is, the way the screen was physically positioned in the classroom depended on the how the practitioners thought about the activity of screen picture-making and the way they thought about the activity influenced where the screen was in the classroom and the flow of movement that surrounded it. The organisation of space was unique to each classroom that I visited. The positioning of the computer ranged from the computer as a 'foreign body' that was excluded from the spaces that the children and practitioners typically moved through, to the computer positioned as part of the central activity space and an object of constant engagement for children and practitioners. The physical organisation of space in the classroom played an important part in determining the way that practitioners monitored screen activity. In turn, their monitoring practices had important implications for how valid a piece of work practitioners considered a screen picture to be, and whether they had considered the possibility that screen picture-making might be an activity that enables a child's learning to be assessed.

In one of the schools, there was a single computer between 45 children but this was placed in the centre of the classroom. As a result, the practitioners described being constantly aware of what was happening

on and around the computer as a result of its position: 'we constantly see it don't we, because they're kind of around here, and we're seeing what kind of things they're making' (GD). In contrast, another school had two computers between sixty children but these were not physically integrated into the set-up of the classroom. The computers were positioned in corners of the room, turned away from main areas of activity and facing blank walls. When LI, one of the practitioners in this school, commented on the presence of the computers in this classroom she suggested a lack of availability: 'I mean we do have computers, but we've got two computers between sixty children and if they don't want to go on it, they don't go on it' (LI). In numerical terms, the availability and access that LI described is comparable (indeed, more) than for the previous setting I outlined. The lack of availability LI referred to seems to be more the result of the classroom practices than the actual number of computers that the school possessed. Practitioners' discourse around screen picture-making and the screen medium in general stems from their current practices; in this way, as described by Chandler (2007), social practices comprise discourse.

9.4 Navigation of a familiar environment/Exploration of an unknown environment

All of the practitioners interviewed suggested that children entered the early years environment with different levels of experience using Information and Communication Technologies (ICTs). This was the result of different levels of exposure to 'techno-literacy practices' (Marsh, 2004) in the home environment. Some children in the classroom were readily identified by practitioners as ICT 'experts' as a result of their confidence with the classroom computer and interactive whiteboard. The competence of these children was often a surprise

given the lack of competence they demonstrated in other areas of development:

I remember in one of my student placement schools, there was a little boy who really wasn't very bright at all and was quite spaced out most of the time but he was fantastic, he knew exactly all the routes to get through everything on the computer, he could turn it on, turn it off, and turn on the main smart board and create just the most amazing things. (FY)

On the other hand, practitioners were aware that at the beginning of the academic year, some children were inexperienced and required support in order to become competent users. The practitioners identified competence on the basis of how confident the children were in approaching the computer, and their control over the mouse:

I mean for some of them it takes a bit longer because if they're not very experienced on the computer then it's a bit more difficult, because if they haven't got a computer at home, to be able to press the mouse at this age for four year olds, they haven't had the practice, they find that quite difficult. (GD)

Of course, the skill with which a tool is used is different to the confidence with which it is used. Children who have had an opportunity to learn through screen picture-making at home may be more or less confident than their peers. They may be more confident if they assume that their own experiences surpass the experiences of their peers, or they may be less confident if their exposure to the screen medium made them aware of skills that they do not possess. A negative experience of mouse manipulation at home for example, could make some children reluctant to engage with screen picture-making in the classroom. Practitioners' comments during interview suggested that this anxiety or reticence would most likely to be interpreted as lack of

competence, though this may not be an accurate reflection. Practitioners' conceptualisations of competence are particularly important given the quick manner in which identities of 'competent' and 'incompetent' users formed over the four days of the ethnographic observations I reported in Chapter 8. Previous literature has also highlighted the important role of teachers in shaping the relationship children have with technologies in the classroom and their development as skilled computer users (Selwyn & Bullon, 2000).

The gap between perceived 'experts' and 'amateurs' was a source of differing levels of concern among the practitioners. Some suggested that the children would rapidly acquire the skills they needed through use in the classroom, supervision and through the helping behaviours of those children that had already developed their skills through use at home. For others, establishing effective ICT provision in the classroom was essential in order to ensure that all children were 'keeping up' with the demands that would be placed on them in formal education and in the context of their wider life:

But I think there's that kind of home-school link is a really important part of it, so we're not saying, ok so it stops there, you know, the level of ICT use can diminish quite a lot if we're not careful. (MD)

This concern mirrors an issue put forward in the research literature regarding practitioners' lack of confidence in facilitating young children's use of screen media (Chen and Chang, 2006; Stephen and Plowman, 2008) and the implications this may have for children's sense of self in either setting (McTavish, 2009; Wohlwend, 2009). It suggests that practitioners are aware of the discrepancy between home and school experiences, though they do not always feel that they are able to attenuate this.

A common theme among all of the practitioners was the need for children to familiarise themselves with a medium before being expected to express themselves fully through the medium. Intention and control were facets of the children's activity that could only develop once they were comfortable with the medium:

...part of it is the familiarity and fluency of the medium. So these children who don't seem to have much conscious intentionality within this medium might be very consciously intentional in another field where they've had more practice or it's a more natural thing to them. (TU)

As a result, screen picture-making was conceptualised as needing to pass through a stage of experimentation and familiarisation before becoming a valid medium in which meaningful content could be explored and represented. Some practitioners therefore limited their initial observations of a child's use of ICT to understanding how familiar the child was with the medium: 'I'd be looking for the way they use the programme...how confident they are with it.' (LI). For LI, this partially mirrored the way that she would observe children when they were using paper to make pictures. She observed how comfortable they were with the medium, as well as considering their intentions in terms of representation:

So it'd be a sort of similar thing, you know, looking for whether they've got pencil control... what pencil control they've got... talking to them about what they're drawing, but quite often to begin with they're not really drawing anything, they're just making marks on paper... (LI)

While this two-part process of observation was in place regardless of the medium, there was a belief that children would most often be more comfortable and familiar with the paper medium. Practitioners felt that

this was demonstrated through the talk that surrounded paper picture-making, which typically related to the content of the representations rather than the tools that were being used:

In drawing, they don't tend to get so excited about the tools... unless you give them like a new furry pen or something, they're like 'well, those are the pens or the pencils or the crayons or whatever', and they, I think they accept it more, maybe because they've had more experience of it early on. (GD)

By positioning experience as a necessary precursor to expression, practitioners were constructing the screen medium as primarily a physical tool; the primary aim related to this physical tool was competent use. In contrast, though not entirely, picture-making on paper was conceptualised as a somewhat familiar process for children of this age, and the primary aim associated with it had therefore shifted. It was described as a semiotic medium through which the children could communicate and express themselves. In the eyes of the practitioners therefore, familiarisation enables the semiotization of the medium. In so doing, it re-creates the medium as the centre of a more effective learning process, since physical competence is coupled with intentional meaning-making. This conceptualisation however, can lead to a vicious cycle, whereby screen picture-making is thought to be largely without semiotic potential and therefore not encouraged; as a result, children struggle to move beyond the phase of familiarisation that practitioners consider necessary for the development of semiotic potential. The semiotic potential of meaning-making on screen has been documented in the research literature (e.g. Mavers, 2007; Bjorkvall and Engblom, 2010; Burnett & Myers, 2006) but this does not appear to be in the foreground of practitioners' conceptualisations of screen picture-making.

9.5 Interaction/Independent activity

All of the practitioners interviewed were able to describe examples of computer use that involved a high level of social behaviour among the children they observed. Despite this, there were still concerns that children would interact less with their peers when using the computer.

They do get involved with other children when they're on the screen, but it tends to be less socially interactive, there is a point in which they are negotiating, laughing together, having fun together, sharing it together, and that's the really good side of it, but the downside of it, well, the worst extreme of that involvement, engagement in the screen is that switched off nature from the rest of the environment. (MD)

As mentioned previously, the perceived lack of interaction was associated by practitioners with the materiality of the computer. Since children were practically confined in their use of the screen (most often a single screen was shared by a maximum of two children), this enabled certain types of interactive behaviour and hindered others. Another likely reason for this association, though not explicitly stated by the practitioners, was in their own practices surrounding the computer screen. Some of the practitioners were aware that they themselves did not participate in much interaction around the computer. MD readily noted that the computer screen was probably the part of the classroom that practitioners dedicated the least amount of time to. As a result, the practitioners' awareness of the social behaviours surrounding the screen was likely to be limited. Furthermore, children are constantly learning from these adult behaviours: they may learn that the screen is not associated with conversation and questioning to the same extent as other activities in the classroom and this might influence the social interactions that develop around the computer.

Even though there was a perceived difference in the level of interaction surrounding the computer screen, the practitioners discussed helping behaviours as an important aspect of children's learning around the screen: 'they're quite good at teaching each other how to use stuff' (GD). Since children entered school with different levels of exposure and experience in using the screen, they often embarked on the process of helping each other with eagerness. Furthermore, the practitioners were more reluctant than in other activities to position themselves as the 'authority' or 'expert'. As a result, screen text-making enabled children to take control and changed the dynamic of interactions between children and practitioners (Schiller and Tillett, 2004). Linked to this, Kress (2003) has suggested that a concern for authority is lessened in a world where multimodal texts are shared globally and continuously transformed by a vast body of individuals. In this study however, the screen medium facilitated the displacement of authority not through its association with interactivity and the Internet, but through its status as a relatively novel resource for meaning-making.

An important part of the practitioners' conceptualisation of screen picture-making was in the potential relationships they saw existing between screen picture-making and oral expression. The quality of the talk that occurred while children were using the medium was an important factor in practitioners' identification of the opportunities for learning embedded in the experience. Directive talk (Dyson, 1986) is an important tool for making sense of the goals that children set themselves when they are picture-making (Cox, 2005; Frisch, 2006). Practitioners generally predicted that the talk surrounding screen picture-making would be related to the tools and the experimental process, rather than the content of the picture; a prediction supported by the findings from my first study. When examples of other kinds of talk were shared with the practitioners, these were met with positive

surprise. For example, when MD was told about Gertrude's narrative about the duck pond, her positive opinion of picture-making within *tuxpaint* was reinforced:

It's stimulated that idea and discussion and language. I mean, that's the ideal. You get something that gets and grips their imagination so that you can get that kind of language and discussion with a child and especially if a child is particularly motivated by a screen, they're going to get more out of it hopefully. (MD)

When using paper, practitioners expected children to communicate more about the content of the picture and the intentions underlying it e.g. 'this is my mum', 'I went to the park'. The practitioners expected the talk that surrounded screen picture-making to take on more of a 'practical' tone in which 'they're talking about what they're doing' (GD). This had important implications for the way that the activity was conceptualised by practitioners. The emphasis on 'doing' talk suggested to them that this was an activity of practical, or even scientific, learning. This led the practitioners to make certain predictions around the types of talk children would engage in further to what their observations had suggested. They expected children to use more narrative talk when doing paper picture-making whereas in screen picture-making, they expected children to interact with each other through a problem-solving discourse e.g. 'How did you do that?' 'What happens if we do that?' This perception is perhaps enhanced by the materiality of the computer screen in the classroom, which, shared between children, is similar to a demonstrator's surface in a science classroom. The actions and reactions are conducted by a single technician (whichever child has control of the mouse) and are observed and commented on by a small group of children.

9.6 Self-expression/Exposure to external stimuli

As described above, the practitioners understood intentional creative output as dependent upon adequate experience with the medium.

Once they've kind of had that experience, they then can begin to think 'I want to do that' or 'I want to quit' or 'I want to do the magic wand because I really like that one and I want to do blue'. (MD)

Without this experience in place, the practitioners predicted that children would be 'distracted by all of the functions and the tools' (LI) and commit their efforts to exploring these rather than expressing particular meanings. This was echoed in the comments of MD in response to the screen pictures created by children attending her school:

...they look to me like someone who's gone 'right, this is the first time I've done this and I'm making these lovely wizzy woo patterns with my mouse...(MD)

In responding to the screen pictures, the practitioners that favoured some pictures over others responded most positively to the products that demonstrated a link to the referential intentions of the maker. This intention was most obvious when there was a clearly discernible object on the canvas. For example, Mischa's use of the paintbrush tool to create a face, and subsequent use of the stamp tool to place a hat on top of the face was the subject of positive comment from both of the practitioners in the school where it was created. They both suggested that the picture demonstrated Mischa's ability to use screen tools in order to carry out her purpose rather than being led away from her intention as a result of the novelty of making a picture on screen.

The child clearly had a purpose, and that's very skilful, the mixing of the hat with the face... I think that's a mature way, that's mature use... getting towards more proper, grown-up use of the medium isn't it. (TU)

Oh, that one's lovely. See, she's not doing that, she's actually thinking about what she's drawing there and using those for a purpose which shows that maybe she had some experience of things like that, maybe more than these others...(LI)

Previous studies have suggested that practitioners in art education most value the referential dimension of picture-making because mimesis – the production of likenesses to the everyday (Cannatella, 2008) – can be used to 'find out what resonates with our students' (p. 6). When children select from ready-made images, they are limited to what is available; by drawing images, are children sharing more of themselves? Art educators have advocated a less singular approach so that non-referential picture-making can be as much a starting point for discussion between practitioner and child as referential picture-making. For example, early advice from Schirrmacher (1986) suggested that practitioners could respond to children's non-referential pictures by commenting on aesthetic aspects (e.g. colour or spatial arrangement), the amount time and effort spent by the child, and how the materials were used.

The visual framework available in *tuxpaint* (the selection of tools along the left; the selection of images along the right; the selection of colours along the bottom) was understood by practitioners as a prop in children's creativity. While it could support the picture-making process, some practitioners voiced concerns that the framework was prescriptive and would not enable truly free expression among children:

I think there is an element of limitation to it because it's predetermining how things look... (MD)

A particular area of concern within one school was the availability of ready-made images which they felt had the power to inhibit children's own creative output. This philosophy was explained in detail by the headteacher TU:

In our setting for instance we have no worksheets, no stencils, no templates... we expect children to draw everything freehand. We actually don't like using ready-made images in that kind of way. We might use them in a specific way... where we provide children with one image to support them to use that image in a drawing of their own, so I'd never use anything like this that had the stamp. I think there's a temptation when there are ready-made images or stamps like this, then the child is put off attempting their own representation because they feel they have to try and make an adult representation.

In this perspective, freehand drawing is conceptualised as truly expressive while image use is not.

On the other hand, MD recognised that while physical frameworks may be less present in freehand drawing, mental frameworks in the form of pictorial schema were still prevalent. This assertion based on her observations is also supported by extensive evidence from previous research on children's drawing (Thomas & Silk, 1990; Malchiodi, 1998). MD suggested that the visual stimuli that characterised the *tuxpaint* screen could have a potentially positive influence since it might coax children away from the stereotypy that characterises much of their drawing on paper. This debate rests on a distinction between internal and external prompts in subject matter and where the valuable stimuli

are thought to lie (Thompson, 1999). This in turn relates to the distinction in discourse that Gardner (1980) noted, whereby children's picture-making might be seen as a natural and instinctive process that should not be interfered with by adults, or alternatively as an opportunity for the development of skills that can be taught by adults. The practitioners that placed a high value on intentionality also identified picture-making that came from 'within' as more valid than picture-making which worked around external images or prompts. The former were evidence of self-expression while the latter were products of adult-imposed ideals. Alternatively, others conceptualised external stimuli in picture-making as pushing children beyond the mental schemata on which they typically relied, and therefore argued that screen picture-making had the potential to encourage new forms of expression for individual children. Furthermore, some practitioners saw *tuxpaint* as offering shortcuts in, rather than alternatives to, representing internal preoccupations. For example, representing rapidly a multiplicity of the same image could stem from an internal desire that is difficult to achieve on paper but straightforward in a programme like *tuxpaint*.

In the school of TU and LI, assessment of screen picture-making and all types of screen use was limited to physical skills in using the computer: 'I think probably they would be looking for ICT skill... control of the mouse, whether they can click and drag' (TU). In the same school, paper picture-making was conceptualised as an essential practice in self-expression and identity and an activity that could be analysed and assessed on multiple levels. This discrepancy between approaches to paper and screen picture-making was the result of a narrow comparison between these activities. Picture-making on screen was seen in terms of its ability to promote the skills and concepts that were part of paper picture-making. The latter was seen as a tool of self-expression, and this could not be achieved by screen picture-making as a result of the

screen's novelty. Thus, screen picture-making was constructed as an inferior type of picture-making, rather than offering a different experience to children that might help them to learn different things or the same things in different ways:

I'm not sure that drawing on an ICT programme enriches anything of what they're doing... well, my belief is that... that their drawing is more expressive and more competent and more theirs. (TU)

9.7 Feeling like a novice/Feeling like an expert

All of the practitioners recognised that screen picture-making would be an enjoyable activity for many of the children that they worked with. They associated this enjoyment with the novelty of the activity. The exploration of a new medium offered children the freedom to try things in an uninhibited and joyful way:

I think that because we don't have it on that often it's quite amusing and it's often about exploring what they can do rather than what the outcome might be. (LI)

In this medium, the practitioners felt that the children would be less concerned with the expectations of themselves and others. For some, this might lead to a sense of being 'de-skilled' since they are not able to make use of the expertise that they have developed and demonstrated in other fields of activity. For other children however, this is empowering since they do not bring negative self-impressions that they harbour to bear on the current activity.

I think it's quite nice that the screen technologies, kind of, help those children who aren't necessarily very able to kind of drawing on... they might be at that early stage, and some

children just won't come and have a go at drawing pictures. They go 'I can't draw, I'm not very good at drawing, I don't know what to do' whereas this kind of gives them the opportunity to create something that can look very nice... I don't know, maybe it's a bit empowering for the ones particularly who are not so confident about immediately going over and mark-making. (FY)

As well as novelty, practitioners suggested that the medium could inspire confidence among users as a result of the ease with which visual material could be added and removed (Wood, 2004). As a result of this material affordance, the children would not need to confront the 'mistakes' they felt they may have made, and could instead rapidly remove them. On paper, the children are forced to either incorporate elements of the picture that did not emerge in the way that they had hoped, or to get rid of these through laborious measures (e.g. rubbing out) that can still leave a trace of the error behind.

I think it's less threatening... if they go wrong, it doesn't matter as much. They know they can rub it out and have another go. (KG)

KG's comment is a potent reminder of the extent to which a medium can have an emotional impact on a child's creative productivity. By implication, the comment suggests that at times, paper can be an intimidating medium because its use involves a process of visual accumulation, where each mark is likely to remain. When practitioners place a particular emphasis on the finished product, the smallest mark-making event is laden with meaning and repercussions. In contrast, the screen environment enables flexibility in the removal and addition of visual material. Furthermore, screen picture-making has not developed an association with the practitioners' interest in the finished product (Labbo, 1996).

Another aspect of screen picture-making that was thought by some practitioners to boost the confidence of children was the presence of ready-made images and the ease with which these could be applied to the screen canvas.

If you draw something they'll sit there and go 'wow, that's amazing, how did you draw that?' whereas if they're able to just stamp it down, they know it looks good. (FY)

From this perspective, ready-made images enable a child to take more pride in their picture-making since they have access to the same images that an adult would. As a result, the association between maturity and competence becomes blurred, since they produce pictures that create a similar impression to those created by older children or even adults. The levelling of competence between adults and children has been noted in relation to other creative uses of ICT (e.g. Schiller & Tillett, 2004) and leads to an alternative classroom dynamic. Other practitioners however, suggested that this could be damaging to children's self-esteem and confidence in the longer-term. They suggested that ready-made images would lead to children becoming inhibited in their freehand drawing, since they would struggle to create representations that were similar to these images – 'the child is put off attempting their own representation' (TU). The transitions between different levels of competence and the identities of 'amateur' and 'expert' would be emotionally taxing.

9.8 Control/Experimentation

When shown examples of screen picture-making, the practitioners tended to respond most positively towards pictures that prioritized the referential dimension. Despite responding so positively to examples that demonstrated this, TU was adamant that it wasn't the referential

function that she valued, but rather control and clear intention. This could be enacted through abstract picture-making also.

...some people, like me, value the way that children choose to put colours and shapes together to make a pleasing picture... I would also value that... (TU)

MD and KG also suggested that they would look for patterns and form in screen pictures, as well as discernible representations of particular objects. However, the ready-made images available within the software often blurred this distinction and made it difficult for practitioners to identify this kind of intention in abstract screen pictures. These images to a viewer are most readily identified as representations of real-world objects, but may have been used by the children as elements in design, or as LI noted, 'another way of making a mark.' As a result, their presence in the picture could lead to the practitioners categorising the pictures as unsuccessful attempts at reference when they were actually examples of abstract picture-making. Mischa's picture was successful in the eyes of the practitioners since the image she had chosen was an appropriate part of the overall representation. On the other hand, Seb's picture was full of images, but these were not coherent in the practitioners' perspective and did not suggest a developed intention, even though the picture was an example of a visually attractive and balanced composition (Arnheim, 1974/1954; Winner & Gardner, 1981; Golomb & Farmer, 1983).

Practitioners understood part of their role in relation to picture-making as interpreters of intention. For example, LI explained that she would talk to the children about their pictures in order to identify whether 'they do have a plan in their mind for those' even though 'it looks to me like they were more experimental'. MD described the use of talk, and in particular oral narrative as being a way to validate a child's picture-making. In an ideal scenario presented by MD, the child's screen

picture would be printed out and the story that accompanied its creation would be written next to the picture and the picture would then be displayed. As a result, all viewers of the picture would have access to the intention of the child and through this the picture would carry more meaning than if it was displayed by itself. These comments demonstrate the extent to which picture-making is valued as a communication of inner ideas (Malchiodi, 1998; Hawkins, 2002). If this aspect is less visible, practitioners are uncertain about the approach they should take in relation to picture-making. In this respect, the approach taken by the practitioners contrasts with the perspective put forward by Kress (1997) in which children's texts are always understood as motivated signs that carry meaning. For the practitioners, motivation, intention and control were synonymous with reference, though when talking generally, they stressed their openness to all of forms of children's expression.

When practitioners looked for evidence of control and intention in picture-making, they did so because these facets of experience were taken to be important indicators of maturity and development in children. Tool experimentation that wasn't controlled and didn't produce discernible representations or patterns was associated with intellectual regression:

That looks... like something you might find in nursery with slightly younger children. Those ones have got slightly more control... there's more shape, there's more definite patterns there, aren't there, I mean you can see there's quite a lot of thought about shapes and points and things happening there. Then I'd say that one's another stage down... (MD)

You see that with that one... I don't know how old that child was but that kind of covering the page is really a stage back on paper than it is on screen. (TU)

Building on the previous spectrum, these approaches conceptualise development as a process of shifting from exploration of the environment to navigation of the environment (Ryan & Grieshaber, 2005). In navigation, the physical world is simply the medium through which children enact or learn about their inner desires and preoccupations. In exploration, the physical world is not a medium, but a subject in of itself. Since practitioners typically saw the environment of *tuxpaint* as not yet navigable due to its novelty, they believed that it would force children to behave in a manner that was more characteristic of a younger age group. The distinction between navigation and experimentation is not an accurate developmental marker since children can begin to identify representations in their pictures from as early as two years of age (Gardner, 1980) and can continue to incorporate picture-making in imaginative and experimental play bouts once they have entered the reception year (Anning, 2003; Hopperstad, 2008).

Not all practitioners were so certain of the link between navigation and maturity. The practitioners in one school suggested that in exploring the environment of *tuxpaint*, the children were exposed to various abstract concepts and symbols that would feature in their later learning and development. In this way, screen picture-making was an opportunity to accelerate the acquisition of knowledge rather than an activity that holds children back in demonstrating their skills and understanding of the world.

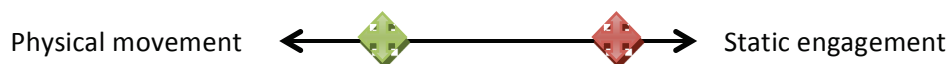
And they've got all those shapes as well, so they can start getting used to those, that some of them have pointy corners, some of them have curved sides because that's the kind of language we use to teach them about shapes, so they're starting to see that in different contexts. (GD)

The size of my sample makes it impossible to associate this difference in approach to wider pedagogical differences. It would be fascinating however, to explore whether the emphasis placed on 'navigation' as opposed to 'exploration' is associated with a more general value placed by practitioners on self-expression as opposed to knowledge acquisition. In exploring *tuxpaint*, children are being exposed to all kinds of knowledge (letters, shapes etc.), so if the aim of early education is the acquisition of knowledge, a strong case can be made that the programme facilitates learning and development. If however, early learning is thought to be about the development of a sense of self, individuality and the ability to communicate with others, then the novelty of *tuxpaint* is a hindering factor and it becomes difficult to position the programme as a tool in learning and development. TU was adamant that children's drawing on paper 'is more expressive and more competent and more theirs'. In this comment, her construction of competence is very much linked to the activity of establishing an expressive presence in the classroom and a strong sense of self.

9.9 Spectrum mapping

An analysis of the interview data according to the seven spectrums I have presented enables practitioners' conceptualisations of screen picture-making to be explored more thoroughly and better understood. Using spectrums rather than themes facilitates an understanding of practitioners' conceptualisations in relation to their approach to early learning more generally. This contextualisation can be achieved visually through the process of spectrum mapping. A position on the spectrums is initially plotted in relation to the practitioners' conceptualisation of early years education (i.e. what early learning should be about) and then the same is done in relation to the practitioners' comments on screen picture-making. For example, in the case of the second

spectrum, a practitioner's thoughts about early learning could be plotted in green, while their conceptualisations of screen picture-making is plotted in red:



This would suggest they believed that early learning should involve a high degree of physical movement and that screen picture-making does not provide this.

Through spectrum mapping, it is possible to highlight areas of tension in the integration of screen picture-making into the early years classroom. Spectrum mapping encourages practitioners to make sense of screen picture-making in the context of their approach to early learning in general, rather than simply comparing it to their perceptions of paper picture-making. In the interviews, practitioners sometimes used the latter polarity to help to articulate their conceptualisations of screen picture-making. For example, they would set up an extreme imaginary scenario whereby children were always using either the paper medium or the screen medium. When these extreme scenarios were set up, as in the following comment from MD, the practitioner's conceptualisation was forced into making a decision of which medium they preferred to see children using. In the early years classroom, there is no need for such a decision to be made since screen picture-making need not replace paper picture-making, particularly if they provide different opportunities for learning.

I would be happier to see a child with a pen or a pencil or a crayon in their hand and a piece of paper than I would sat at a screen drawing. If they're always doing that and never holding a pen and pencil, I would worry that way around, but if they're always drawing but never on a screen, I wouldn't worry. (MD)

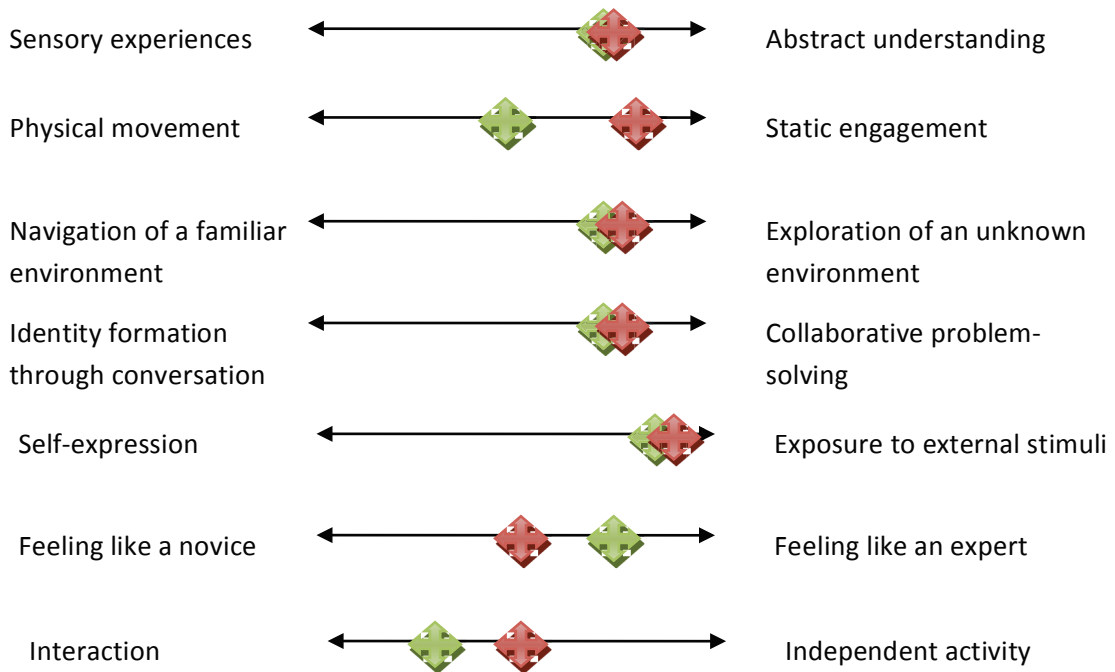
It was a similar comparison that led TU to argue that paper picture-making was 'more competent and more expressive and more theirs'. On the other hand, when practitioners refrained from painting this extreme scenario and suggested a situation of balance where children would have access to both kinds of picture-making, the focus then fell on identifying the types of learning that either medium enabled and maximising this experience for children. Thus, it is less helpful for practitioners to conceptualise screen picture-making in relation to paper picture-making than for them to see it in the context of all early learning. Using the spectrums encourage practitioners to do the latter, since only the activity in question and an approach to learning is plotted. Furthermore, rather than seeing the activity of screen picture-making as a singular entity, the spectrums help practitioners to tease apart the different aspects of the activity and identify their attitude in relation to each. The process constructs the early years teacher as a researcher since it enables dialogue and reflection about specific practices in the classroom in relation to wider theoretical approaches (Moss, 2006).

To test but also make best use of this way of modelling practitioners' conceptualisations, it would be necessary to ask schools to rate themselves on the spectrums with respect to both their early learning approach and their conceptualisation of screen picture-making. The areas of discrepancy could then be used by practitioners as the starting point for discussing their approach to screen picture-making and how they wish to change this in the future. Such a model would be applicable beyond screen picture-making, and could be used in relation to any activity that has not yet been fully integrated into the classroom or a teacher's practice. By using a model that can be tailored to each school, spectrum mapping targets the distinct properties of each 'sociotechnical environment' (Bruce, 1997) and empowers schools to reflect on and improve the integration of digital environments, while

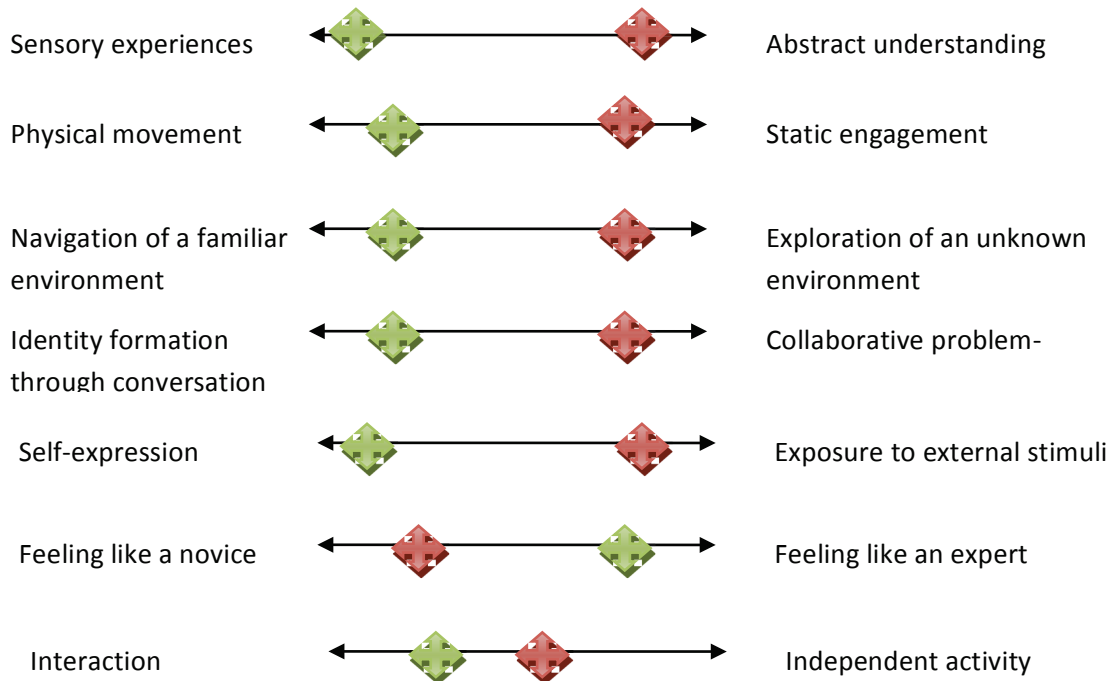
debating what they have to offer and the possible disadvantages they entail.

Below are spectrum maps for each of the three schools that I worked with. In these examples, I have plotted points on each spectrum on the basis of comments that were made in the interviews. I coded these comments and represented this visually through the spectrum mapping. If spectrum mapping were to occur on a larger scale, this process would be done by practitioners themselves and would constitute another opportunity for productive discussion about their views and ideals.

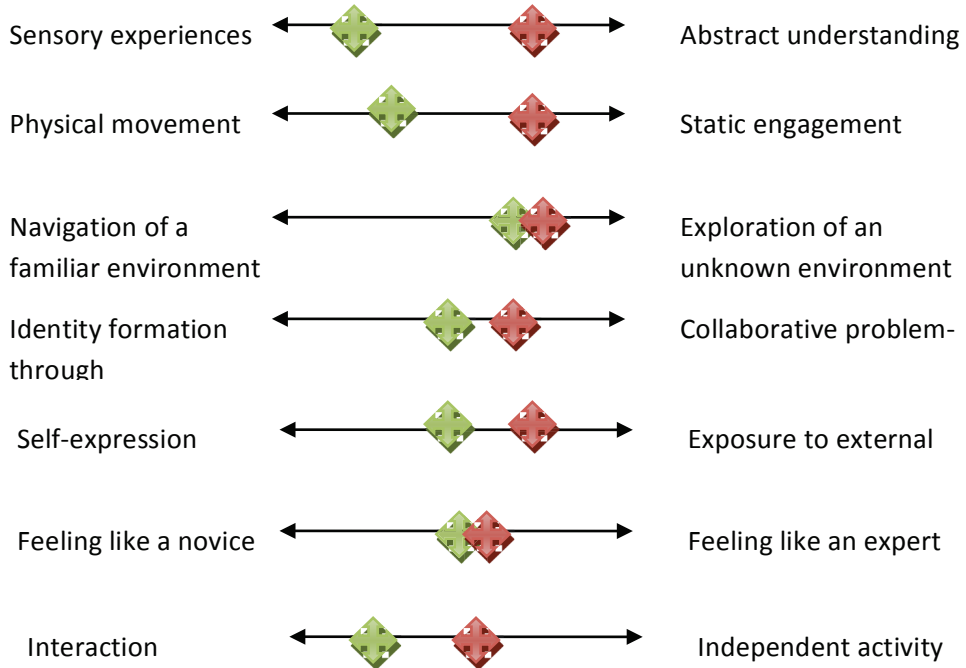
School 1



School 2



School 3



Creating spectrum maps for the three schools that I worked with demonstrates the diversity that exists between institutions in terms of the way they conceptualise screen picture-making and the way they approach early learning more generally. The specificity of the spectrum maps to particular institutions can make them a practical tool for change; they can act as support for focused and productive discussions about the integration of digital environments. In the case of screen picture-making, I was able to identify particular areas of concern for each school and issues that needed to be resolved in order for screen picture-making to be better integrated into the classroom and incorporated into the practitioners' approach towards children's semiotic activity.

9.9.1 Change

In using the spectrums to frame their thinking, it is possible for schools to highlight clear areas of tension that may prevent practitioners from adopting screen picture-making in their classrooms or knowing how to integrate it effectively into their teaching practice. To explain further how this would work, I have identified a potential point of tension for each school I worked with in the integration of screen picture-making. Below, I describe each of these examples and the practical steps that might follow as a result of reflecting on these tensions.

9.9.1.1 Too static? (School 1)

The practitioners in School 1 were positive about the opportunities for learning that screen picture-making offered. They understood the screen medium as a tool that facilitated interaction among children and enabled particular children to be more confident in their picture-making,

particularly as a result of the ready-made images that are available in the context of software like *tuxpaint*. The comments of the practitioners in this school did suggest however, that they believed screen picture-making would entail less physical movement than other activities that the children typically engaged with. For example, they described how children's use of the computer was constrained by the number of chairs that were positioned in front of the computer. While paper picture-making could be done while children were standing up around a table, with a fluctuating number of children present, they conceptualized screen picture-making as an activity that would be enacted by two children at a time, sitting side by side. These views reflect the current set of practices that surround the screen medium in this classroom, but screen picture-making need not necessarily be enacted in this way. For example, in the whole class study I reported in the previous chapter, screen picture-making took place on a laptop that was placed on a small, low table on a corner of the communal carpet area. As a result of this position, different numbers of children clustered around the laptop on different occasions and they would lie, sit or stand around the computer, often changing their position in order to see what was happening on screen. In this context, the amount of physical movement surrounding screen picture-making was much greater than that described by the practitioners in School 1. Thus, discussions relating to the spectrum of physical movement might lead the practitioners in this school to test different material realizations of screen picture-making, placing the computer on a communal carpet area or even placing a laptop outside in areas associated with high levels of physical movement. Alternatively, the practitioners might decide that one of the things they value about screen picture-making is that it provides a distinct opportunity for children to become used to activities involving static engagement; this might be important to practitioners trying to

prepare children for life in school beyond the early years foundation stage.

9.9.1.2 Too adult? (School 2)

The practitioners in School 2 were the least positive about screen picture-making of all the practitioners interviewed. They demonstrated a high level of concern that the screen medium would engender less interaction between children and less physical and sensory exploration of the world. They saw the screen as a medium that would reduce children to novices in their semiotic activity, returning them to a precursory experimental mark-making phase. They were also concerned that screen picture-making, and *tuxpaint* in particular, was too adult-led in its design. In particular, they challenged the presence of ready-made images that could be applied by children to the screen at the single click of a button. It is this particular concern that I will discuss here. Building on the philosophy of Read (1970), they saw such images as detrimental to the creative and artistic development of children. Rather than trying to express internal images, the practitioners in this school believed that screen picture-making would lead to children copying and embodying adult-imposed visions of the child's world. In this opinion, the practitioners were least vehement about the photographs of everyday objects contained in *tuxpaint* and most vehement about the cartoon images that the software includes. In line with the 'unfolding' discourse described by Gardner (1980), the practitioners saw children's picture-making as an activity that should be protected from adult interference. Research on children's picture-making has shown however, how images from popular culture are often emotionally significant to children and are treated by children as exciting resources for making meaning (Thompson, 2003; Dyson, 2003; Wilson & Wilson, 1977). With this in mind, the next step for the

practitioners in School 2 might be to explore further and challenge their strong views regarding ready-made images. In close observations of how children use such images, they might see examples of use that lead them to a different understanding of the semiotic possibilities associated with these resources. Alternatively, they might decide that their observations support the views they have about ready-made images and make an informed decision about whether software such as *tuxpaint* should be excluded from the classroom and recommendations about its use issued to parents of children in the school. Either way, it is important for this to be a debated issue in the school and this is more likely to occur if the practitioners engage with the process of spectrum mapping in relation to screen picture-making. As well as challenging their own aversion to ready-made images, the practitioners in this school might research screen picture-making software that does not contain ready-made images, or software that allows children to take and download their own pictures to be stored in an image bank that is built into the software.

9.9.1.3 Too removed? (School 3)

Practitioners in School 3 were open to the opportunities for learning involved in screen picture-making, but had some concerns particularly around the physical and sensory exploration inspired by screen picture-making. As with School 1, they worried that screen picture-making did not facilitate a large degree of physical movement and thought that children would tend to be static in their use of the screen medium. Linked to this, they discussed early years learning as a highly sensory experience that involves a large degree of physical mess, while perceiving computers as 'removed' and 'abstracted' from this kind of sensory learning. In a targeted reflection around this particular spectrum, the practitioners could ask whether it is inevitable that the

computer screen is an abstract medium, or whether this is how it has been constructed as a result of the materialities and practices that exist in the school. For example, it may be that the hardware used by the school does not enable learning to feel 'hands-on' whereas a more tangible technology would allow for this. On an iPad for example, children could 'paint' through their fingertips or use a stylus to re-create the feeling of using a pen or paintbrush (Matthews & Seow, 2007; Couse & Chen, 2010). As well as considering the hardware, the practitioners could consider where the computer is in the classroom; is it away from the areas of the classroom where mess is acceptable? If it were more integrated with other activities, would it become a medium that is more associated with the sensory experiences that are so valued by the teachers? As a result of the costs associated with technologies, schools often keep them removed from other areas of the classroom and the practices associated with these spaces. As hardware becomes less expensive however, there may be less of a perceived need to keep the computer distinct from other activities and from the 'mess' associated with these activities. This will shift practitioners' conceptualizations of the screen medium so that it is no longer 'removed' from the highly sensory experiences that practitioners associate with early learning. Another important point for reflection in this school would be to consider the extent to which all children enjoy engaging with the physical 'mess' of an activity like finger painting. In my ethnographic observations of the classroom, not all children wanted to get their hands dirty with paint or glue. Thus, the screen medium might offer an opportunity for such children to engage with the practice of picture-making without being put off by the amount of 'mess' involved.

9.10 Conclusions

By exploring practitioners' conceptualisations of screen picture-making through interviews, my focus shifted from how the activity is enacted by children to how the activity is received and shaped by the 'interpretive community' of the early years classroom. This shift was necessary in order to understand the social context that surrounds the activity of screen picture-making, and to contextualise the differences that emerge when picture-making occurs in different media. Following an analysis of the interview data and with reference to previous literature in the field, I created seven spectrums that enabled me to make sense of practitioners' conceptualisations of screen picture-making and how these are related to their approach to early learning more generally. By mapping these factors onto the spectrums, areas of tension in the integration of screen picture-making into the early years classroom were highlighted. These tensions were specific to each school involved in the study. Spectrum mapping is helpful from a practice perspective because the areas of tension identified are specific to the school and precise in terms of content. By the latter, I mean that they do not relate to general impressions of screen picture-making, but separate distinct issues that each need to be taken into account individually. In the future, these spectrums can be used by schools as a starting point for productive discussion about the integration of screen picture-making, or ICT activities more generally, into early learning. They encourage practitioners to think about such activities not as an 'add-on' to the existing classroom, but instead to engage with the potential role that these activities could play in the wider context of early learning.

Spectrum mapping has immediate practical benefits for schools and individuals; this is one of the most important contributions for practice of this thesis. Simultaneously however, making sense of screen picture-making through the discourse that surrounds early learning more

generally enables us to challenge this discourse. By evaluating screen picture-making against the notions of intention, control and self-expression, we can question these very concepts and their place in early learning. In particular, the concept of 'self-expression' has been questioned in the art and design education literature since the 1970s (e.g. Wilson & Wilson, 1977; Hawkins, 2002) but the practitioner interviews show it continues to be an influential lens through which children's picture-making is understood. Practitioners associate self-expression with freehand drawing that refers to discernible elements in the child's everyday experience. When pictures are non-referential, practitioners are unsure of how to use them in gathering insights into the lives of the children they work with and as a basis for learning. Changing the medium in which pictures are made is an opportunity to engage practitioners in a more sustained interrogation of the 'self-expression' discourse, in which expression is synonymous with referential picture-making, which in practice constitutes a small proportion of the practices with which children engage.

Chapter 10

Conclusions

10.1 Overview

In this thesis, my intention was to explore how meaning is made in the context of young children's picture-making, and how this is changed when it occurs in the screen medium. In order to conduct investigations in this field, I adopted a social semiotic approach to meaning-making that prioritized both the material and social nature of signs (Hodge & Kress, 1988; van Leeuwen, 2005). Key theoretical tenets guided the research including Jakobson's (1960) meaning functions; poststructuralist discussions of 'floating signifiers' and 'empty signifiers' (Derrida, 1976, 1980; Barthes, 1977); the concept of affordances and their construction over time (Jewitt & Kress, 2003); and the notion of the 'interpretive community' that surrounds and shapes semiotic activity (Fish, 1980). An initial literature review helped to identify the four questions that became the specific focus of the thesis:

RQ1: How is children's screen picture-making similar/different to their paper picture-making?

RQ2: What are the distinct affordances of screen picture-making?

RQ3: How is screen picture-making enacted in the early years classroom environment and what is the discourse that surrounds it?

RQ4: How do early years practitioners conceptualise screen picture-making and do they see a role for the activity in early learning?

In this, the final chapter of my thesis, I will respond to each of these

questions in turn using the findings from my research. I will then discuss the theoretical contributions of my research and the practical implications of the thesis findings. Finally, I will consider the questions that are left unanswered by my research, and suggest how these could be approached in future research.

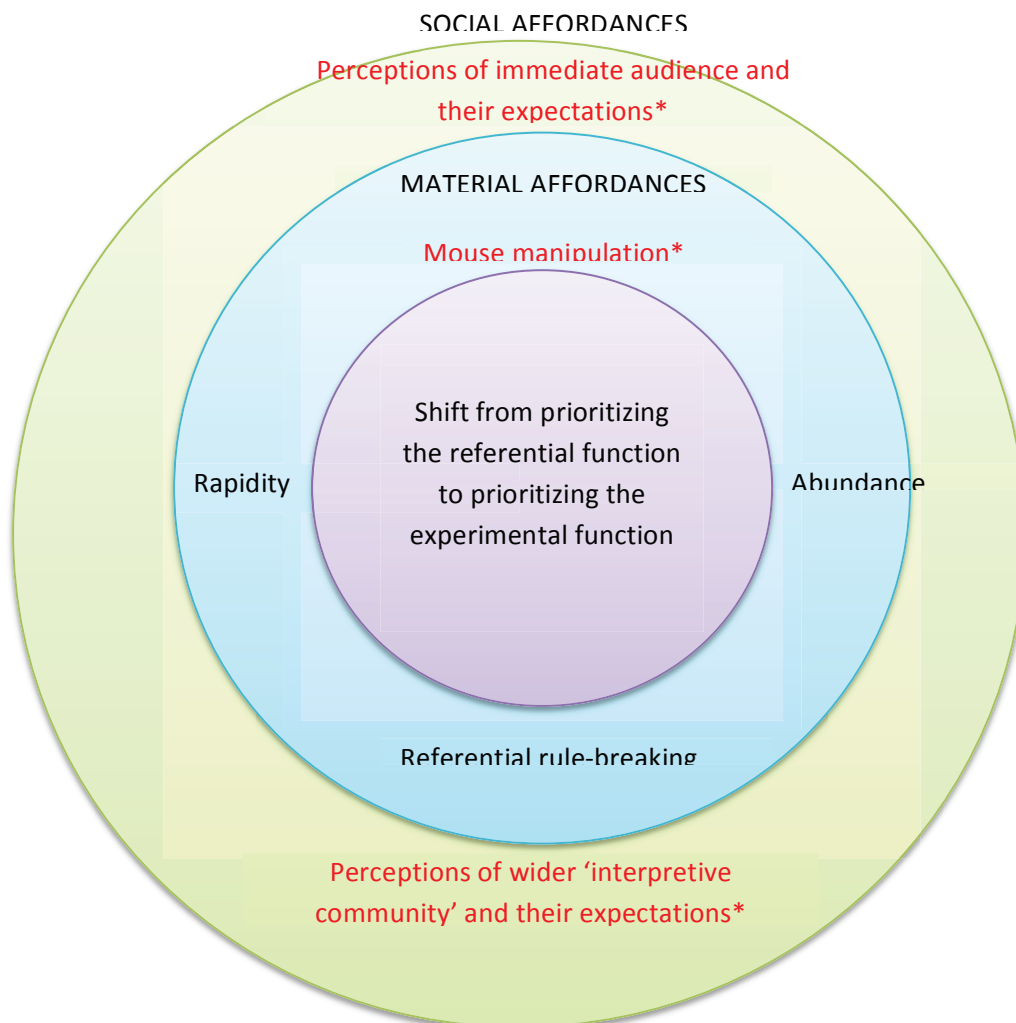
10.2 Screen and paper picture-making

There were differences in the content and composition of paper and screen pictures, as well as differences in the talk that surrounded picture-making with either medium. In screen pictures, there was a noticeable lack of people, places and action, and more of the children's attention was directed towards image use and experimentation with the different tools available in *tuxpaint*. Visual analysis of picture composition demonstrated a similar shift. When children were creating pictures on screen, they tended to take a more process-based approach and paid more attention to the aesthetic outcome or the experimental process, rather than the discernible subject matter contained in their representations. In the narrative talk that surrounded picture-making, children using paper drew on a wider range of sources in order to build their narratives, while children using *tuxpaint* were more likely to use the picture-making activity itself as a starting point for narrative. Collectively, these differences suggest that when the medium of picture-making occurs via the screen medium, there is a shift in children's focus away from the referential dimension of picture-making and towards other non-referential dimensions of the activity (experimental, aesthetic, social). This shift can also be conceptualized as navigation away from a focus on the products of picture-making and towards a focus on the process as it unfolds.

10.3 Affordances of screen picture-making

Why were children more likely to prioritise the non-referential dimensions of picture-making in the context of the screen medium? In order to answer this question, I used the notion of affordances to consider the material properties and social associations of the medium that would encourage such a shift. Affordances work in conjunction with one another so that they are best represented through system networks (Jewitt, 2009), which illustrate the various ways in which meaning is constrained or facilitated within a given mode or medium. System networks have been constructed for a vast range of modes, media and artefacts, from the mode of the image (Kress & van Leeuwen, 1996) to the medium of interactive media texts (Maher, 2011). A system network of screen picture-making has not previously been constructed. By drawing together the affordances of screen picture-making that were important in shaping content, composition and narrative, I have developed such a map. Below I outline the key material and social affordances that feature on this map (figure 10.1): abundance, rapidity, referential rule-breaking, mouse manipulation and audience (both the immediate audience in the given situation and the wider 'interpretive community' surrounding the activity). I consider mouse manipulation and the perceptions of audience to be mediated by the familiarity of the child with the screen medium and the specific software used for screen picture-making.

Figure 10.1 A 'system network' of young children's screen picture-making



*Influence mediated by novelty/familiarity

Abundance

Abundance refers to the plethora of tools that are available in *tuxpaint* and the visual prominence that they are given in the user interface. While children making pictures on paper can also use a wide variety of tools to create diverse effects, these possibilities do not constantly form a visual frame around their activity. When children make pictures on

screen, they are constantly presented with the option to use an alternative tool. The tool sidebar acts as a constant reminder of the option to switch tools. The abundance of *tuxpaint* is also manifest in the great number and diversity of ready-made images available once users have chosen the 'stamp' tool. While there were many stickers available to children making pictures on paper, these did not parallel the number of images available in the software and their presentation on sheets, rather than a scrollable interface, did not create the same impression of abundance. I have argued that the sense of abundance created in screen picture-making fosters experimentation because users feel encouraged to try new tools and to use ready-made images more often than drawn images. The use of ready-made images in turn influences the content, composition and narratives involved in pictures.

Rapidity

Rapidity refers to the rate at which children add and remove visual material during screen picture-making. Rapidity is facilitated by the material properties of picture-making in *tuxpaint*, which mean that ready-made images can be added and removed at the single click of a button. Furthermore, removing images from the screen does not degrade the visual quality of the picture since the layering of visual information on screen can be endless. In contrast, picture-making on paper is constrained by the reluctance of users to attempt to remove previously added material. The material capability for rapidity in screen picture-making creates a 'remix' mind-set among children (Lankshear & Knobel, 2006), whereby they do not need to be too careful about what they add to their picture since they have the option of removing it or covering it over immediately afterwards. These factors encourage children to focus more on the process of picture-making than on the

product. Picture-making is no longer understood as the accumulation of visual material in order to create a finished product, and is instead primarily a platform for experimentation.

Referential rule-breaking

It was not only how children could add material to the screen but also what they could add to the screen that facilitated a focus on non-referential dimensions. The application of ready-made images via the 'stamp' tool was popular among children. Most of the images available in *tuxpaint* are realistic in the sense that they are photographs of objects from the everyday world, but they are not realistic in relation to one another. An image of a strawberry in *tuxpaint* is twice as big as an image of an apple. As a result, children using these images need to decide how best to integrate this information, which is full of referential discrepancies. The most common approach among the children in my study was to avoid a referential approach and to prioritise instead the experimental or aesthetic dimensions of picture-making. Images that did not follow referential rules of size were used as elements of design or experimentation, rather than elements in a coherent mimetic representation of the everyday world.

Audience

A sense of audience, or the 'interpretive community', was essential in the process of picture-making. Audience enabled children to 'semiotize' (Bjorkvall & Engblom, 2010) the various material capabilities described above. While children could layer endless amounts of information onto the screen without any clearly coherent relationships between the representations, their considerations of audience constrained them in

this activity. They demonstrated a belief that referential picture products would be more valued than products that prioritized other meaning functions. This finding supports previous research in this area (e.g. Rose et al., 2006). In attempts to foreground the referential dimension, children would construct a referential relationship between ready-made images following the placement of these images onto the screen, or they would erase layers of visual material just before the end of the session and replace them with a drawn image similar to what they might have created on paper. Despite this, the fact that the immediate audience to their picture-making consisted of me, rather than practitioners or family members, changed the approach that they took, and enabled a more experimental outlook. I had validated experimentation through the interactive demonstration that I carried out at the beginning of each picture-making session. While I was also the immediate audience in the examples of paper picture-making, I was accompanied in these instances by an established forum of reception through each child's previous experiences of paper picture-making. Children in the study associated making pictures on paper with a practitioner and family audience, who were more likely to appreciate referential, rather than experimental, efforts (Anning, 2003). The latter claim was verified in relation to practitioners through the semi-structured interviews I conducted with this group (see section 10.5).

Familiarity

A child's familiarity with the screen medium had an influence on their screen picture-making because it impacted on the control that they demonstrated when using the computer mouse, as well as influencing their perceptions of audience and the 'interpretive community' surrounding the activity. Frequent use of the computer and mouse

would have increased the likelihood that these tools were 'ready-to-hand' for the child (Heidegger, 1962/1927); in turn, this would have an influence on the content and composition of their pictures. For example, being able to control the mouse might increase the likelihood that a child would include a drawn image of a human figure. Familiarity would also change a child's perceptions of what is expected of them when they are engaged in the activity since each exposure to the activity is an opportunity for feedback from peers, parents or practitioners. In the words of Kress and Jewitt (2003, p. 2), the affordances of the medium would become with exposure 'more fully and finely articulated'. I have argued that one of the reasons why screen picture-making was enacted differently in this study was because the expectations that surrounded the activity were less established; however, as the screen medium becomes increasingly familiar to children, this will no longer be a difference. Some of the children in this study may have been as familiar with screen picture-making as they were with paper picture-making as a result of experiences they had had in the home environment; as screen picture-making is integrated into the early years classroom, this will be the case for a greater proportion of young children. Mouse manipulation will no longer be a key consideration (it will be equivalent to the manipulation of a pencil or pen or replaced by input devices that more closely resemble those used in the context of the paper medium; see Matthews & Seow, 2007); and perceptions of the expectations of the 'interpretive community' will no longer be less established (though they may be established differently to those associated with paper picture-making).

10.4 Screen picture-making in the classroom

A small-scale social semiotic ethnography of screen picture-making in the early years classroom suggested that the activity is instead constructed as various ‘worlds’, which each involve a distinct set of practices (Labbo, 1996). Some of these ‘worlds’ are more referential in nature (e.g. the screen as landscape), some more experimental (e.g. the screen as laboratory), some more aesthetic (e.g. the screen as canvas) and some more social (e.g. the screen as playground). These ‘worlds’ of screen picture-making exist simultaneously in the classroom context, but are also in tension with one another. These tensions were explored through ethnographic observations of key interactions between children. Longer-term processes, particularly regarding archival and retrieval will validate certain sets of practices and invalidate others. Thus, while a diversity of ‘worlds’ might currently characterize screen picture-making in the classroom, this is unlikely to last as the activity becomes more embedded in the classroom and more constrained by the expectations that surround it.

10.5 Practitioners’ conceptualisations of screen picture-making

By exploring practitioners’ conceptualisations of screen picture-making through interviews, my focus shifted to look at how the ‘interpretive community’ of the early years classroom receives and shapes this activity. In order to analyse the interview data, I created seven spectrums that would enable me to compare practitioners’ approaches to early learning more generally with their understanding of screen picture-making as an activity. These spectrums highlighted tensions between what practitioners felt early learning should be like, and their expectations as to how screen picture-making would unfold in the early years classroom. For example, some practitioners felt that early

learning should be a highly sensory or tactile experience, and believed that screen picture-making was more suitable for abstract learning. The tensions identified through spectrum mapping were specific to individuals and institutions, but the process offers a helpful starting point from which practitioners can discuss the inclusion and use of screen picture-making in the classroom. A common finding among practitioners that needs to be problematized was an impression that screen picture-making was less referential only because children did not have the capabilities necessary to act according to the referential dimension. Thus, there was a hierarchy in practitioners' approach to picture-making, whereby referential picture-making was considered to be more valid than experimentation, highly social picture-making, or a focus on aesthetic principles. As the latter functions were more likely to emerge in the context of screen picture-making, practitioners sometimes conceptualized the computer as a deficient medium for children's self-expression and creativity. The value placed by practitioners almost exclusively on referential picture-making needs to be questioned; there is an urgent need for other types of picture-making to be better understood and valued to a greater extent (Kolbe, 2005).

10.6 Theoretical contributions

Inspired by Jakobson (1960) and the different language functions he theorized, I conceptualized picture-making in terms of four meaning dimensions that could each be more or less prioritized in a specific instance of the activity. The four meaning dimensions I introduced in relation to picture-making were the referential dimension, the experimental dimension, the social dimension and the aesthetic dimension. These proved to be helpful in elucidating my observations of children's picture-making, regardless of the medium that they were using. Furthermore, they were helpful in understanding the differences

between media and the way that these differences influenced the practices that were enacted when meaning was made via them. Future research could adopt these dimensions as a way of making sense of picture-making. Having said this, I am aware that there are theoretical issues with the dimensions I have introduced. The very notion of separating the fully integrated process of meaning-making into four distinct dimensions is problematic. In practice, individuals are not likely to consciously prioritise one over another and all examples of picture-making will involve the dimensions acting in tandem with one another. Metaphors such as Labbo's 'worlds' model offer an alternative way of conceptualizing and distinguishing between different types of meaning-making without constructing such artificial distinctions. I would argue that both theoretical avenues – disentangling dimensions and constructing metaphors – are helpful in understanding the patterns underlying observed practices. Strict comparisons between media are enabled through discussions of meaning dimensions and how these are prioritized to a greater or lesser extent in particular situations; while observations of a single medium and how it is constructed in context is added by the development and use of analytical metaphors.

As well as creating and using tools that made it possible to gain an insight into the differences between distinct media, I established a system network (Jewitt, 2009) of the specific affordances at work in screen picture-making. The network, illustrated in figure 10.1, is helpful for those exploring screen picture-making or screen text-making. However, the major contribution offered by this network is not in the specificities of this particular diagram, but instead in the process through which this network was constructed and what it suggests about the usefulness of the term 'affordances'. In order to map the affordances of screen picture-making in an effective way and consider how these were different to those present in paper picture-making, I found it necessary to distinguish between material and social

affordances. Material affordances were the physical properties of the activity that would constrain how it was conducted. The social affordances were cultural and historical facets of the activity that would influence the way it was enacted e.g. the associations of the medium with a particular type of activity. To consider both the material and the social is apt within a social semiotic framework, but, as Oliver (2005) has pointed out, the deconstruction of the term 'affordances' into the material and the social suggests that the term is a conflation of concepts that could remain theoretically distinct from one another. I agree that the term is a conflation, but I would argue that it is still helpful because it challenges us, as social semioticians, to be ever-aware of the constant dialogue that exists between the material and social aspects of semiotic activity. All of the key properties that I have noted as material affordances are influenced by social systems and practices. For example, the abundance that characterizes the materiality of screen picture-making is simultaneously a social phenomenon: our perceptions and responses to abundance depend on our previous experiences of it. Similarly, all of the associations I have described as social (e.g. the concept of the 'interpretive community') are materially manifested. For example, the beliefs of the 'interpretive community' with regards to an activity will influence how that activity is physically set up in the classroom. Thus, while I agree with Oliver (2005) that the term 'affordances' does not represent a unitary or 'neat' concept, I would suggest that there are few alternatives that conjure notions of the dialogue between material and social to the same extent. With that in mind, I would advocate for its continued use in understanding various modes and media.

Little previous research has considered the manner in which the affordances of a medium are constructed over time in specific communities of practice. My ethnographic observations were an attempt to bear witness to affordances becoming more 'fully and finely

articulated' as suggested by Jewitt and Kress (2003, p. 2). The interactions that shape practices relating to a particular medium and activity are surprisingly visible in the early years classroom. A single day of observations will give rise to some remarkably upfront conversations between children regarding what a particular medium is for or how a specific activity should be conducted. Using such conversations as a starting point for discussion empowers users; they enable us to imagine a diverse range of possibilities for the use and construction of a medium (Samuelsson & Carlsson, 2008). By taking into account this multiplicity and refraining from seeing the future of a medium in a singular and inevitable way, users are empowered to construct the medium and practices associated with it in the ways most useful or pleasurable to them. In this approach, there is a greater opportunity for various 'worlds' of the medium to co-exist in productive tension with one another. Having said this, I would suggest that the diversity of practices associated with a relatively new semiotic activity will typically converge over time and a particular set of practices, a 'world' of use, will increasingly dominate alternative practices and 'worlds'. The nature of this narrowing depends on the intricate flows of power that resonate in the particular context (Foucault, 1972). By examining the process over time, the semiotic activity is better understood, but so too are the social dynamics and relationships that exist in a community or social group. Examining how a semiotic activity in the classroom is shaped over time offers a means for understanding the various discourses at work in the classroom and how these are enacted in the everyday lives of children and practitioners.

10.7 Implications for practice

My research into screen picture-making suggests that by changing the medium of children's pictures, the way that meaning is made in this

activity is also changed. Through screen picture-making, the dominance of the referential dimension in children's picture-making is questioned, and non-referential forms of meaning are brought into the foreground. This is partly a result of material properties involved in screen picture-making, but is also a consequence of a less-established 'interpretive community' surrounding the activity. By openly engaging with the material properties of the medium, practitioners and parents will help children to become more aware of the meaning potentials at work in composition. Beyond this, a focus on the material itself provides an opportunity to engage children in fascinating discussions about the structure of the world they live in. For example, commenting on a child's choice of a ready-made image in tuxpaint (rather than simply stating what the image refers to) will encourage that child to think about the images that are available to them in the software and whether they would prefer to have other images available. Taking this discussion further, a child might question who was responsible for deciding which images to include in the software and why the responsibility was given to them. A practitioner interested in these issues might introduce software that enables children to take photographs themselves and upload them into the image bank. Children could discuss which type of software they prefer and why. Through this level of engagement with the properties of the text-making medium, students as young as four years, can be empowered to understand their agency in the context of the cultural, political and economic world.

The classroom observation study and practitioner interviews suggested that the fluidity that currently surrounds screen picture-making is a temporary phenomenon. Though not all practitioners were disparaging about screen picture-making, they were wary of a medium that encouraged experimentation at the expense of reference. This suggests that they would integrate screen picture-making into the classroom in a way that encouraged the representation of discernible

subject matter in pictures and discourage the construction of the screen as, to use the metaphors from Chapter 8, a 'laboratory' or 'workshop'. There are a myriad of longer-term practices that they could control in order to shape the activity in this way. By setting up certain processes and practices around archival and retrieval for example, more value could be placed on pictures that prioritise the referential dimension.

I would argue that there are both positive and negative reasons underlying practitioners' focus on reference. The main positive reason for encouraging visual reference is that practitioners are seeking to understand better the experience of the child who is making the picture. Practitioners see pictures as an opportunity to gain insights into the child's life-world (Cannatella, 2008). In the manner described by Lemke (2000, 2002), texts are a way of gathering the disparate 'self', and this gathering is thought, by practitioners, to be more straightforward when the texts are referential. The main negative reason for discouraging abstract picture-making is the lack of knowledge and understanding that practitioners in the early years can bring to visual meaning that is not clearly referential. This is by no means an attack on practitioners, but instead an attack on the discourse that surrounds art and design in the early years. In training early years teachers to respond effectively to the picture-making of young children, there should be a greater focus on how young children employ principles of visual composition (e.g. balance); the opportunities for productive talk accompanying the process of picture-making when it is not referential; and the different ways that children can use ready-made images to build meaning. Stephen (2010) argues that early years pedagogy is in urgent need of more research that explains how children learn in different situations, particularly new situations that are supported by relatively novel technologies or media. The findings reported here respond to this need by outlining the various ways in which children engage with screen picture-making and the opportunities these provide for learning.

Screen picture-making is a phenomenon that needs to be understood by practitioners in the early years, but it is also an opportunity for practice in the early years to be questioned more generally. In monitoring this particular activity closely, and watching how it unfolds in the environment of the early years classroom, we can begin to look in a fresh way at the practices that surround picture-making in the early years regardless of medium. The material realisations of screen picture-making push non-referential meaning to the foreground and demand that we consider how this kind of meaning is best supported in the picture-making practices of young children. While I have developed a tool that will enable practitioners to have productive discussions around the integration of screen picture-making into the classroom, there is also a need for practitioners to be challenged on the attitudes they take towards children's picture-making in general. Why is reference preferable to the construction of picture-making as a workshop, playground or laboratory? If children wish to construct the activity space in the latter ways, how can practitioners facilitate progression through appropriate pedagogical strategies? Labbo's 'worlds' model is a strong foundation through which practitioners can begin to appreciate the diversity of children's purposes and outcomes when they are engrossed in picture-making, and a wider range of opportunities for learning. In disseminating my research among the local community of early years practitioners, I have talked about picture-making in terms of 'worlds' and would argue that this is an informative and inspiring model through which practitioners can engage with the various dimensions at work in young children's picture-making.

10.8 Future research

In conducting this research, I was met by a plethora of questions that could not be answered by the theories and methods I had employed but constituted fascinating starting points for further investigation in this field. In the sections below, I introduce these questions and suggest how they could be approached in the future.

10.8.1 The nature of digital images

At every point in my consideration of screen picture-making, the digital ready-made images that are available in screen picture-making software were of central importance. They were a key material difference between paper and screen and led to the construction of distinct practices in relation to picture-making via either medium. In understanding the differences in content, composition and narrative that arose when children made pictures on screen, I drew on material affordances associated with the ready-made images that were available to them in *tuxpaint*. The abundance of images and the rapidity with which they could be applied shaped how children conducted the activity, both when making pictures individually, and when working with peers in the early years classroom context. Furthermore, digital ready-made images were brought up as a key difference between media by all practitioners in the interview study. Some discussed the images with concern, suggesting that they would inhibit children's creativity and self-expression, while others argued that ready-made images helped the children to be more confident in their picture-making. In every study I conducted, the images available in screen picture-making were at the heart of the observed or perceived difference between paper and screen. With this in mind, I began to question further the nature of these images and their distinct properties as 'digital-beings' (Kim, 2001). More

specifically, I wondered whether and in what ways they were similar or different to drawn images. With ready-made images, the maker acts primarily through selection. While selection is also a facet of drawing images since you are selecting what and how to draw, drawing comprises the slow accumulation of visual material that exists at a more detailed level. What are the phenomenological implications of this difference and how best can we explore them? By making detailed comparisons of picture-making that involves either kind of image (ready-made or drawn), and by interviewing children about the experience, perhaps using textual elicitation, it would be possible to gain a deeper insight into what these distinct semiotic activities offer to the text-maker. Beyond the experience of the individual, social dynamics might be apparent in different ways in either type of textual activity. For example, while drawing offers an opportunity to construct images that exist outside of the dominant discourse (hence the controversy that can surround satirical cartoons), how can you escape the mainstream discourse or the 'regime of truth' (Foucault, 1980) when the database from which you are selecting images has been constructed within it?

10.8.2 The relationships we construct with digital information

My ethnographic observations demonstrated that the practices of digital archival, retrieval and overwriting can become the subject of tension and negotiation in the classroom. Not all individuals have the same ideas about how digital information should be stored or retrieved in the future. The difference between physical space and cyberspace mean that the rules of ownership and archiving that are typically obeyed for paper pictures are not necessarily adopted for digital information. Although many of the metaphors that guide interface design are based on our understanding text-making and text storage on paper (e.g.

keeping 'files' in 'folders' on the 'desktop'), digital environments also offer an opportunity for individuals to move away from these practices. The relationships that communities construct with the digital information they have created will depend on a range of factors; the metaphors that are presented to them through the design of the interface, but also the social associations that exist in relation to the medium more generally. For example, digital images are increasingly discussed in the discourse of 'digital remix', whereby a plethora of digital information is available to individuals who can put it together in new ways in order to create original texts. Future research would build on these observations by conducting a longer-term classroom ethnography that looks specifically at issues of digital archival, retrieval and overwriting. It would be necessary to conduct parallel observations in different educational settings to see how negotiations unfold in relation to the approaches of practitioners and the informal learning that children experience outside of the classroom context. The text-making software could perhaps offer users the opportunity to choose how to store digital information. The discussions that would then be had around these choices would enable insights into how digital information is perceived and constructed by children and adults.

10.8.3 Classroom constructions of text-making

By exploring the distinct affordances of screen picture-making, the practices of paper picture-making, and text-making more generally, were challenged. For example, the comparison of the paper and screen medium led to questions about the value that practitioners place on the referential dimension of texts and the extent to which they de-value other non-referential dimensions of young children's picture-making. This is a productive challenge as it encourages us to focus on enabling practitioners in the early years classroom to support the diversity of

children's picture-making and the learning opportunities that this diversity comprises. Future research could challenge practitioners' views of picture-making further. For example, by looking at the way young children's textual products are stored and displayed in schools, we could consider how different types of meaning-making are valued and treated differently. This is the subject of a book chapter I am currently writing for *Multimodal Writing: The State of the Art in Theory and Pedagogy* (forthcoming). The chapter looks at the written captions practitioners display beside children's drawings on the walls of their classrooms. By observing the juxtaposition of teachers' writing and children's drawings in the early years classroom, I am hoping to gain an insight into teachers' conceptualisations of drawing and the way that writing is established in the classroom as a tool for the disambiguation of children's visual meaning-making (Anning, 2002, 2003). Such studies inform our understanding of writing and image in relation to the wider social context; in particular, I argue that teachers' writing is used to override the potentially subversive qualities of children's drawings and support idealized constructions of childhood (Thompson, 2003; Dyson, 2003, 2008).

10.8.4 Exploring non-referential dimensions of picture-making

I have suggested that practitioners are less confident in responding to young children's picture-making when it appears to prioritise dimensions of meaning that are non-referential. Thus, when children are experimenting with tools or communicating with their peers through picture-making, practitioners are more likely to be unsure of how to respond in order to support learning. I have not undertaken a study of the pedagogical strategies that would support the development of activity that relates to these dimensions, but this would be a fruitful topic for future research. Through guided inquiry studies practitioners could

develop a greater awareness and understanding of children's non-referential picture-making. In guided inquiry research, individuals in the field of practice conduct their own research projects and based on their findings, build an intervention that immediately impacts upon the community of practice. Such methodologies enable teachers to get 'under the skin' of the semiotic activities that exist in their classroom, and this is a key tool in the empowerment of individuals in the semiotic realm (Kress, 2013). As well as changing the pedagogical practices that surround art and design in early years education, teachers' understanding of experimentation, the aesthetic and the social in children's picture-making could influence the way we think about art in general. By looking at children's physical engagement with the properties of a medium for example, we are more likely to see and critique art as an embodied and intercorporeal activity that foregrounds the modes of touch and manipulation (Springgay, 2005).

10.8.5 Metaphors of design

Labbo's 'worlds' model was central in the analysis of my ethnographic observations. The model rests on a set of metaphors through which constructions of children's semiotic activity can be identified, categorized and better understood. Such metaphors are not just ways of understanding semiotic activity; they are present and influential throughout the activity itself. In the context of screen text-making, metaphors are pervasive in the design of the interface through which text-making occurs. For example, the presence of 'files' and 'folders' on the typical computer stems from a metaphor of paper record-keeping. This metaphor is important in the construction of archival and retrieval practices that in turn influence the relationship that individuals will have with digital information. Thus, there are metaphors that guide the way we conceptualise and analyse screen text-making practices as

researchers, and there are metaphors that users themselves construct in order to navigate the experience. In addition, it would be exciting to consider how metaphors are employed from the designers' perspectives. Are the same metaphors that guide analysis and use present in the design of the medium? For example, do designers of *tuxpaint* conceptualise the software as a potential 'playground' or 'stage' for children's semiotic activity, or would they be surprised by examples of use that are best understood through these metaphors?

In order to engage with these questions, it would be necessary to establish a conversation between the designers of *tuxpaint* and the observation data of children engaging with the software. How would the designers respond to observations of the various 'worlds' that children create when they are engaged in screen picture-making? Which of the 'worlds' would they have anticipated and which would be surprising to them? How would this impact on their future design of later editions of the software? Beyond metaphors that are adult-imposed analyses of children's semiotic work, there are the labels that children apply to their own activity. For example, I described in Chapter 8 how children referred to filling the screen as 'flooding'. Typically in text-making software this function is represented by the icon of a tipped paint can; this is an example of interface design based on the practices of paper text-making. The metaphor of 'flooding' presents an imaginative alternative that designers might wish to adopt. Metaphors are central to the design of computer interfaces but, as this example shows, the metaphors we use in the context of screen picture-making can be more imaginative than just those stemming from paper picture-making. Being observant of the stories children tell about the interfaces they use enables us to be more creative in the way that practitioners and designers think about the interface and the digital environment.

10.9 Final thoughts

The increasing presence of new digital environments in our everyday lives means children's picture-making is more likely to occur on screen in the future. As a result, there is a demand for us to understand how this new medium shapes the meanings that children make through its material properties and social associations. I have argued that screen picture-making has affordances that bring non-referential forms of meaning-making into the foreground. This is exciting given the dominance of referential meaning in the way we have made sense of children's picture-making in research so far and the way that practitioners currently engage with children's picture-making. By observing the diversity of semiotic practices, or 'worlds', that children construct in the context of screen picture-making, it is possible to maximize opportunities for learning in the early years classroom, as well as challenge the way we have thought about children's picture-making, regardless of the medium through which it occurs.

An established semiotic practice occurring via an established medium can become 'fully and finely articulated' (Kress & Jewitt, 2003, p. 2) to the point of petrification. In the early years classroom, paper picture-making occurs within a set of expectations that make semiotic innovation and diversity less likely. By enabling children to enact picture-making in the screen medium, the activity is re-invigorated and becomes a site for productive contestation between children. Conversations and disagreements between children about what constitutes a 'picture' are more likely to occur when a medium is relatively novel in the way that the screen medium is. Such interactions are productive because they encourage children and practitioners to reflect on meaning-making and challenge their understanding of semiotic processes. In doing this, they will see the extent to which questions of the semiotic are interwoven with questions of power,

community and the 'self'. Increasingly, educational research and practice is observing and exploring children's semiotic activity when it is enacted through screen media. I would argue that such observations are not only helpful in understanding children's screen text-making and its role in education, but are also essential for facilitating wider reflections on the ways children make meanings across modes and media, and how this is shaped by the 'interpretive community' of the early years classroom.

References

- Andersson, S. (1994) *Social scaling and children's graphic strategies: A comparative study of children's drawings in three cultures*. Linköpings: Linköpings universitet.
- Anning, A. (1997) Drawing out ideas: Graphicacy and young children. *International Journal of Technology and Design Education*, 7(3), 219-239.
- Anning, A. (1999) Learning to draw and drawing to learn. *Journal of Art & Design Education*, 18(2), 163-172.
- Anning, A. (2002) Conversations Around Young Children's Drawing: The Impact of the Beliefs of Significant Others at Home and School, *International Journal of Art and Design Education*, 21 (3), pp. 197 – 208.
- Anning, A. (2003) Pathways to the Graphicacy Club: the Crossroad of Home and Pre-school, *Journal of Early Childhood Literacy*, 3 (1), pp. 5 -35.
- Arnheim, R. (1954/1974) *Art and visual perception*. Berkeley, CA: University of California Press.
- Aubrey, C., & Dahl, S. (2008) A review of the evidence on the use of ICT in the Early Years Foundation Stage. Accessed online 01.10.2013 from: <http://dera.ioe.ac.uk/1631/>
- Bakhtin, M. M. M. (1981) *The dialogic imagination: Four essays* (No. 1). Austin, TX: University of Texas Press.
- Barthes, R. (1977) *Image, music, text*. London: HarperCollins
- Barthes, R. (1978). *A lover's discourse: Fragments*. New York: Hill & Wang.
- Betts, D. J. (2006) Art therapy assessments and rating instruments: do they measure up? *The Arts in Psychotherapy*, 33(5), 422-434.
- Bhatti, G. (2012) Ethnographic and representational styles. In J. Arthur, M. Waring, R. Coe & L. V. Hedges (Eds.) *Research Methods and methodologies in Education* (pp. 80-85). London: Sage.

- Bianchi-Berthouze, N., Kim, W. W., & Patel, D. (2007) Does body movement engage you more in digital game play? And Why? In J. Luo (Ed.) *Affective Computing and Intelligent Interaction* (pp. 102-113). Berlin: Springer.
- Bjorkvall, A., & Engblom, C. (2010) Young children's exploration of semiotic resources during unofficial computer activities in the classroom. *Journal of Early Childhood Literacy*, 10(3), pp. 271-293.
- Bloome, D., Katz, L., & Champion, T. (2003) Young children's narratives and ideologies of language in classrooms. *Reading & Writing Quarterly*, 19(3), 205-223.
- Braun, V., & Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Bruce, B. C. (1997) Literacy Technologies: What stance should we take? *Journal of Literacy Research* 29 (2), pp. 289-309.
- Bruner, J. S. (1990) *Acts of Meaning*. Cambridge, MA: Harvard University Press.
- Burkitt, E., Barrett, M. & Davis, A. (2003) Children's colour choices for completing drawings of affectively characterized topics. *Journal of Child Psychology and Psychiatry*, 44, pp. 445 – 455.
- Burkitt, E., Jolley, R. & Rose, S. (2010) Attitudes and Practices that Shape Children's Drawing Experience at Home and at School. *International Journal of Art and Design Education*, 29 (3), 257 – 270.
- Burnett, C. (2010) Technology and literacy in early childhood educational settings: a review of research. *Journal of early childhood literacy*, 10 (3), pp. 247 – 270.
- Burnett, C. & Myers, J. (2006) Observing children writing on screen: exploring the process of multimodal composition. *Language and Literacy*, 8 (2). Accessed online 01.04.2013:

<http://ejournals.library.ualberta.ca/index.php/langandlit/article/view/17806>

- Calvert, S. L., Rideout, V. J. , Wooland, L. L. , Barr, R. F. & Strouse, G. A. (2005) Age, ethnicity and socioeconomic patterns in early computer use. *American Behavioural Scientist*, 48 (5), pp. 509-608.
- Cameron, D. (2001) *Working with spoken discourse*. London: Sage.
- Cannatella, H. (2008). *The richness of art education*. Rotterdam: Sense.
- Chandler, D. (2007) *Semiotics: the Basics* (2nd Ed). Abingdon: Routledge.
- Chen, J. Q., & Chang, C. (2006). Using computers in early childhood classrooms Teachers' attitudes, skills and practices. *Journal of Early Childhood Research*, 4(2), 169-188.
- Cherney, I. D., Seiwert, C. S., Dickey, T. M., & Flichtbeil, J. D. (2006) Children's drawings: A mirror to their minds. *Educational Psychology*, 26(1), 127-142.
- Chia, J., & Duthie, B. (1993) Primary children and computer-based art work: Their learning strategies and context. *Art Education*, 46(6), pp. 23-41.
- Coates, E. (2002) 'I Forgot the Sky!' Children's Stories Contained Within Their Drawings'. *International Journal of Early Years Education*, 10(1), 21-35.
- Cordes, C., & Miller, E. (2000). Fool's gold: A critical look at computers in childhood. Alliance for Childhood. Accessed online 01.04.2013: http://drupal6.allianceforchildhood.org/fools_gold.
- Couse, L. J., & Chen, D. W. (2010) A tablet computer for young children? Exploring its viability for early childhood education. *Journal of Research on Technology in Education*, 43(1), 75.
- Cox, S. (2005) Intention and Meaning in Young Children's Drawing. *International Journal of Art and Design Education*, 24 (2), pp. 115 – 125.

- Cox, M. V., & Rowlands, A. (2000). The effect of three different educational approaches on children's drawing ability: Steiner, Montessori and traditional. *British Journal of Educational Psychology*, 70(4), pp. 485-503.
- David, M., Edwards, R., & Alldred, P. (2001). Children and School-based Research: 'informed consent' or 'educated consent'?. *British Educational Research Journal*, 27(3), 347-365.
- DeBell, M. & Chapman, C. (2006) Computer and Internet Use by Students in 2003. Statistical Analysis Report. National Centre for Education Statistics. Accessed online 01.04.2013:
<http://0-nces.ed.gov.opac.acc.msmsc.edu/pubs2006/2006065.pdf>
- Delamont, S. (2004) Ethnography and participant observation. In C. Seale, G. Gobo, J. F. Gubrium & D. Silverman (Eds.) *Qualitative research practice*. London: Sage.
- Derrida, J. (1976) *Of Grammatology* (trans. G. C. Spivak) Baltimore, MD: John Hopkins University Press.
- Derrida, J. (1980) *Writing and difference*. Chicago, IL: University of Chicago Press.
- Diem-Wille, G. (2001) A therapeutic perspective: the use of drawings in child psychoanalysis and social science. In T. Van Leeuwen & C. Jewitt (Eds.) *The handbook of visual analysis*. London: Sage.
- Donker, A., & Reitsma, P. (2007) Drag-and-drop errors in young children's use of the mouse. *Interacting with computers*, 19(2), pp. 257-266.
- Dourish, P. (2001) Seeking a foundation for context-aware computing. *Human-Computer Interaction*, 16(2-4), pp. 229-241.
- Dyson, A. H. (1986) Transitions and tensions - interrelationships between the drawing, talking, and dictating of young-children. *Research in the Teaching of English* 20 (4), pp.379-409.

- Dyson, A. H. (2003) " Welcome to the jam": Popular culture, school literacy, and the making of childhoods. *Harvard Educational Review*, 73(3), 328-361.
- Dyson, A. H. (2008) Staying in the (Curricular) Lines Practice Constraints and Possibilities in Childhood Writing. *Written Communication*, 25(1), 119-159.
- Eco, U. (1976) *A Theory of Semiotics*. Bloomington, IN: Indiana University Press.
- Eisner, E. W. (2004) What can education learn from the arts about the practice of education. *International Journal of Education & the Arts*, 5(4), 1-12.
- Fey, M. E., Catts, H. W., Proctor-Williams, K. & Tomblin Xuyang Zhang, J. B. (2004) Oral and written story composition skills of children with language impairment. *Journal of Speech, Language and Hearing Research*, 47, pp. 1301-1318.
- Flannery, K. A., & Watson, M. W. (1995) Sex differences and gender-role differences in children's drawings. *Studies in Art Education*, 114-122.
- Fish, S. (1980) *Is There a Text in This Class? The Authority of Interpretive Communities*. Cambridge, MA: Harvard University Press.
- Foucault, M. (1972) *The archaeology of knowledge*, trans. AM Sheridan Smith. London: Tavistock.
- Freeman, M., & Mathison, S. (2009). *Researching children's experiences*. New York: The Guilford Press.
- Frisch, N. S. (2006) Drawing in Preschools: A Didactic Experience. *International Journal of Art and Design Education*, 25 (1), pp. 74 -85.
- Gardner, H. (1980) *Artful scribbles: The significance of children's drawings*. New York: Basic Books.
- Gardner, H. (1982) *Art, mind, and brain: A cognitive approach to creativity*. New York: Basic Books.

- Geertz, C. (1973). *The interpretation of cultures: Selected essays*. New York: Basic Books.
- Golomb, C. (1974) *Young children's sculpture and drawing: A study in representational development*. Cambridge, MA: Harvard University Press.
- Golomb, C. (1992) *The child's creation of a pictorial world*. Berkeley, CA: University of California Press.
- Golomb, C. & Farmer, D. (1983) Children's Graphic Planning Strategies and Early Principles of Spatial Organization in Drawing. *Studies in Art Education*, 24 (2), pp. 86 – 100.
- Gombrich, E. H. (1982) *The image and the eye: Further studies in the psychology of pictorial representation*. Oxford: Phaidon.
- Goodwin, C. (2000) Action and embodiment within situated human interaction. *Journal of pragmatics*, 32(10), 1489-1522.
- Harris, D. B. (1963) *Children's Drawings as Measures of Intellectual Maturity*. New York: Harcourt, Brace & World.
- Haugland, S. (2000) Early Childhood Classrooms in the 21st Century: Using Computers to Maximise Learning. *Young Children*, 55 (1), 12 – 18.
- Haugland, S. & Wright, J. L. (1997) *Young Children and Technology: A World of Discovery*. New York: Allyn & Bacon.
- Hawkins, B. (2002) Children's drawing, self expression, identity and the imagination. *International Journal of Art & Design Education*, 21(3), 209-219.
- Heft, T. M., & Swaminathan, S. (2002) The effects of computers on the social behavior of preschoolers. *Journal of Research in Childhood Education*, 16(2), 162-174.
- Heidegger, M. (1962/1927) *Being and Time* (trans. J. Macquarrie & E. Robinson). New York: Harper.

- Hodge, R. & Kress, G. (1988) *Social Semiotics*. Ithaca, NY: Cornell University Press.
- Holt, D. (1997) Problems in Primary Art Education: Some reflections on the need for a new approach in the early years. *International Journal of Early Years Education*, 5(2), 93-100.
- Hopperstad, M. H. (2008) How children make meaning through drawing and play. *Visual Communication*, 7(1), 77-96.
- Hurworth, R. (2012) Techniques to assist with interviewing. In J. Arthur, M. Waring, R. Coe & L. V. Hedges (Eds.) *Research Methods and methodologies in Education* (pp. 177-186). London: Sage.
- Jakobson, R. (1960) *Linguistics and poetics*. Cambridge, MA: MIT Press.
- Jakobson, R. (1973) Selected Writings (Volume 2). Accessed online 01.09.2013:
<http://www.ebooksread.com/authors-eng/roman-jakobson/selected-writings-volume-2-oka.shtml>
- Jewitt, C. (ed.) (2009) *The Routledge Handbook of Multimodal Analysis*. London: Routledge.
- Jewitt, C. & Kress, G. (2003) Introduction. In C. Jewitt & G. Kress (eds.) *Multimodal Literacy*. New York: Peter Lang Publishing.
- Johnson, R. (1996) What is Cultural Studies Anyway? In J. Storey (Ed.) *What is Cultural Studies?* (pp. 75-114). London: Arnold.
- Jorgensen, D. L. (1989) *Participant observation: A methodology for human studies*. London: Sage.
- Kapitan, L. (2007) Will Art Therapy Cross the Digital Culture Divide?. *Art Therapy*, 24(2), 50-51.
- Kenner, C. (2000) *Home Pages: Literacy Links for Bilingual Children*. Staffordshire:

Trentham Books.

Kim, J. (2001) Phenomenology of digital-being. *Human studies*, 24(1-2), 87-111.

Knobel, M., & Lankshear, C. (2008) Remix: The art and craft of endless hybridization. *Journal of Adolescent & Adult Literacy*, 52(1), pp. 22-33.

Kolbe, U. (2005) *It's not a bird yet: The drama of drawing*. Byron Bay, NSW: Peppinot Press.

Koppitz, E. M. (1968) *Psychological Evaluation of Children's Human Figure Drawings*. London: Grune & Stratton.

Kress, G. (1997) *Before writing: Rethinking the paths to literacy*. London: Routledge.

Kress, G. (2003) *Literacy in the new Media Age*. London: Routledge.

Kress, G. (2013) *Multimodality: A social semiotic approach to contemporary communication*. London: Routledge.

Kress, G. & van Leeuwen, T. (1996) *Reading images: the grammar of visual design*. New York: Routledge.

Kress, G., & Van Leeuwen, T. (2002) Colour as a semiotic mode: notes for a grammar of colour. *Visual Communication*, 1(3), 343-368.

Labbo, L. D. (1996) A semiotic analysis of young children's symbol making in a classroom computer centre. *Reading Research Quarterly* 31(4), pp. 356-385.

Labbo, L.D. & Reinking, D. (2003) Computers and early childhood education. In Hall, N., Larson, J. & Marsh, J. (Eds.) *Handbook of Early Childhood Literacy* (pp. 338-354). London: Sage.

Lamb, B. (2007) Dr. Mashup or, Why Educators Should Learn to Stop Worrying and Love the Remix. *Educause review*, 42(4), 13-14.

Lankshear, C. & Knobel, M. (2006) *New Literacies: Everyday Practices and Classroom Learning*. Maidenhead: Open University Press.

- Latour, B. (1987) *Science in action: How to follow scientists and engineers through society*. Milton Keynes: Open University Press.
- La Voy, S. K., Pedersen, W. C., Reitz, J. M., Brauch, A. A., Luxenberg, T. M., & Nofsinger, C. C. (2001) Children's Drawings A Cross-Cultural Analysis from Japan and the United States. *School Psychology International*, 22(1), 53-63.
- Lemke, J. (2000) Across the Scales of Time: Artifacts, Activities and meanings in Ecosocial Systems, *Mind, Culture and Activity*, 7 (2), pp. 273 – 290.
- Lemke, J. (2002) Language development and identity: multiple timescales in the social ecology of learning. In C. Kramsh (Ed.) *Language Acquisition and Language Socialization* (pp. 68 – 87). London: Continuum
- Levi-Strauss, C. (1950/1987) *Introduction to the Work of Marcel Mauss* (trans. Felicity Baker). London: Routledge & Kegan Paul.
- Lillis, T. (2008) Ethnography as Method, Methodology, and 'Deep Theorizing': Closing the Gap Between Text and Context in Academic Writing Research. *Written Communication*, 25 (3), pp. 353 – 388.
- Lowenfeld, V. (1947) *Creative and Mental Growth*. New York: MacMillan.
- Luquet, G. (1927) *Les dessin enfantin*. Paris: Alcan.
- Machover, K. (1949) *Personality Projection in the Drawings of the Human Figure*. Springfield, IL: Thomas.
- Maher, D. (2011) Using the multimodal affordances of the interactive whiteboard to support students' understanding of texts. *Learning, Media and Technology*, 36(3), pp. 235-250.
- Mäkelä, A., Giller, V., Tscheligi, M., & Sefelin, R. (2000, April). Joking, storytelling, artsharing, expressing affection: a field trial of how children and their social network communicate with digital images in leisure time. In *Proceedings of the SIGCHI conference on Human factors in computing systems* (pp. 548-555). ACM.

- Malchiodi, C. A. (1998) *Handbook of Art Therapy*. New York: The Guilford Press.
- Marsh, J. (2004). The techno-literacy practices of young children. *Journal of Early Childhood Research*, 2(1), pp. 51-66.
- Marsh, J., Brooks, G., Hughes, J., Ritchie, L., Roberts, S. and Wright, K. (2005) *Digital Beginnings: Young Children's Use of Popular Culture, Media and New Technologies*. Sheffield: University of Sheffield, Literacy Research Centre.
- Matthews, J., & Jessel, J. (1993) Very young children use electronic paint: A study of the beginnings of drawing with traditional media and computer paintbox. *Visual Arts Research*, 19 (1), pp. 47-62.
- Matthews, J., & Seow, P. (2007) Electronic paint: Understanding children's representation through their interactions with digital paint. *International Journal of Art & Design Education*, 26(3), 251-263.
- Mavers, D. (2007) Semiotic resourcefulness: a young child's email exchange as design. *Journal of Early Childhood Literacy* 7 (2), pp.155-176.
- McLuhan, M. & Fiore, Q. (1967) *The Medium is the Massage*. New York: Bantam.
- McTavish, M.(2009) "I get my facts from the internet": A case study of the teaching and learning of information literacy in in-school and out-of-school contexts. *Journal of early childhood literacy*, 9 (1), pp. 3 - 28.
- Mears, C. L. (2012) In-depth Interviews. In J. Arthur, M. Waring, R. Coe & L. V. Hedges (Eds.) *Research Methods and methodologies in Education* (pp. 170 – 175). London: Sage.
- Mercer, N. (2008). The seeds of time: Why classroom dialogue needs a temporal analysis. *The Journal of the Learning Sciences*, 17(1), pp. 33-59.

- Mercer, N., & Wegerif, R. (1999) Is exploratory talk productive talk? In K. Littleton & P. Light (Eds.) *Learning with computers: Analysing productive interactions* (pp. 79 – 102). London: Routledge.
- Moss, P. (2006) Structures, understandings and discourses: possibilities for re-envisioning the early childhood worker. *Contemporary issues in early childhood*, 7(1), 30-41.
- Nicolopoulou, A. (2008) Rethinking Character Representation and Its Development in Children's Narratives. In J. Guo, E. Lieven, N. Budwig, S. Ervin-Tripp, K. Nakamura & S. Ozcaliskan (Eds.) *Crosslinguistic Approaches to the Psychology of Language: Research in the Tradition of Dan Slobin* (pp. 241 – 251). New York: Taylor & Francis.
- Nicolopoulou, A. & Richner, E. S. (2007) From Actors to Agents to Persons: The Development of Character Representation in Young Children's Narratives. *Child Development*, 78 (2), pp. 412 – 429.
- Norman, D. (1988) *The Design of Everyday Things*. New York: Basic Books.
- Oliver, M. (2005) The problem with affordance. *E-Learning and Digital Media*, 2 (4), pp. 402 – 413.
- Orleans, M., & Laney, M. C. (2000) Children's Computer Use in the Home Isolation or Sociation?. *Social Science Computer Review*, 18(1), 56-72.
- Ormerod, F. & Ivanic, R. (2000) 'Texts in practice: interpreting the physical characteristics of children's project work'. In D. Barton, M. Hamilton & R. Ivanic (Eds.) *Situated Literacies: Reading and Writing in Context* (pp. 91 – 108). London: Routledge.
- Patton, M. Q. (2002). Two Decades of Developments in Qualitative Inquiry A Personal, Experiential Perspective. *Qualitative Social Work*, 1(3), pp. 261-283.
- Plowman, L., & Stephen, C. (2003) A 'benign addition'? Research on ICT and pre-school children. *Journal of Computer Assisted Learning*, 19(2), 149-164.

- Plowman, L., & Stephen, C. (2005). Children, play, and computers in pre-school education. *British journal of educational technology*, 36(2), 145-157.
- Preece, A. (1987) The range of narrative forms conversationally produced by young children. *Journal of Child Language*, 14, pp. 353 – 373.
- Price, S., & Pontual Falcão, T. (2011) Where the attention is: Discovery learning in novel tangible environments. *Interacting with Computers*, 23(5), pp. 499-512.
- Price, S., Sheridan, J. G., Falcão, T. P., & Roussos, G. (2008) Towards a framework for investigating tangible environments for learning. *International Journal of Arts and Technology*, 1(3), 351-368.
- Prince, G. (1999) Revisiting Narrativity. In W. Grünzweig & A. Solbach (Eds.) *Grenzenüberschreitungen: Narratologie im Kontext / Transcending Boundaries: Narratology in Context* (pp. 43–51). Tübingen: Gunter Narr Verlag,
- Prosser, J. (Ed.) (2012) *Image-based research: A sourcebook for qualitative researchers*. London: Routledge.
- Read, H. (1970) *Education through art*. London: Faber and Faber.
- Resnick, M. (2006) Computer as paint brush: Technology, play, and the creative society. In D. Singer, R. M. Golinkoff & K. Hirsh-Pasek (Eds.) *Play= Learning: How play motivates and enhances children's cognitive and social-emotional growth* (192-206). New York: Oxford University Press.
- Richards, R. (2003) 'My Drawing Sucks!' Children's Belief in Themselves as Artists. *NZARE/AARE Conference 2003*, 29th November – 3rd December.
- Roberts-Holmes, G. (2012) 'It's the bread and butter of our practice': experiencing the Early Years Foundation Stage. *International Journal of Early Years Education*, 20(1), 30-42.

- Rogoff, B. (1990) *Apprenticeship in thinking: Cognitive development in social context*. Oxford: Oxford University Press.
- Rogoff, B., Mosier, C., Mistry, J., & Göncü, A. (1993) Toddlers' guided participation with their caregivers in cultural activity. *Contexts for learning: Sociocultural dynamics in children's development*, 23, pp. 230-253.
- Rose, G. (2011). *Visual methodologies: An introduction to researching with visual materials*. London: Sage.
- Rose, S. E., Jolley, R. P., & Burkitt, E. (2006) A review of children's, teachers' and parents' influences on children's drawing experience. *International Journal of Art & Design Education*, 25(3), 341-349.
- Rudrum, D. (2005) From narrative representation to narrative use: Towards the limits of definition. *Narrative*, 13(2), pp. 195-204.
- Ryan, S., & Grieshaber, S. (2005) Shifting from developmental to postmodern practices in early childhood teacher education. *Journal of Teacher Education*, 56(1), 34-45.
- Samuelsson, I. P., & Carlsson, M. A. (2008) The playing learning child: Towards a pedagogy of early childhood. *Scandinavian Journal of Educational Research*, 52(6), 623-641.
- Schiller, J. and Tillett, B. (2004) Using digital images with young children: Challenges of integration. *Early child development and care*, 174 (4), pp. 401 – 414.
- Schirmacher, R. (1986) Talking with young children about their art. *Young Children*, 41(5), 3-7.
- Selwyn, N., & Bullon, K. (2000) Primary school children's use of ICT. *British Journal of Educational Technology*, 31(4), 321-332.
- Selwyn, N. & Oliver, M. (2011) Learning, Media and Technology: looking backwards and moving forward. *Learning, Media and Technology*, 36 (1), pp. 1 – 3.

- Springgay, S. (2005) Thinking through bodies: Bodied encounters and the process of meaning making in an e-mail generated art project. *Studies in Art Education*, 34-50.
- Stebbing, P. D. (2004) A Universal Grammar for Visual Composition? *Leonardo*, 37(1), 63-70.
- Stephen, C. (2010) Pedagogy: The silent partner in early years learning. *Early years*, 30(1), 15-28.
- Stephen, C., & Plowman, L. (2008) Enhancing learning with information and communication technologies in pre-school. *Early Child Development and Care*, 178(6), pp. 637-654.
- Stephen, C., McPake, J., Plowman, L. & Berch-Heyman, S. (2008) Learning from the children: exploring preschool children's encounters with ICT at home. *Journal of Early Childhood Research*, 6 (2), pp. 99-117.
- Tharinger, D. J., & Stark, K. D. (1990) A qualitative versus quantitative approach to evaluating the Draw-A-Person and Kinetic Family Drawing: A study of mood-and anxiety-disorder children. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 2(4), 365.
- Thomas, G. V., & Silk, A. M. J. (1990) *An introduction to the psychology of children's drawings*. New York: Harvester Wheatsheaf.
- Thompson, C. M. (1999) Action, Autobiography and Aesthetics in Young Children's Self-Initiated Drawings. *Journal of Art and Design Education* 8 (2), pp. 155- 161.
- Thompson, C. M. (2003). Kinderculture in the art classroom: Early childhood art and the mediation of culture. *Studies in Art Education*, 44(2), pp. 135-146.
- Thorne, B. (1993) *Gender Play: Girls and Boys in School*. Buckingham: Open University Press.

- Tuman, D. M. (1999) Gender style as form and content: An examination of gender stereotypes in the subject preference of children's drawing. *Studies in Art Education*, 40-60.
- Van Leeuwen, T. (2005) *Introducing Social Semiotics*. Abingdon: Routledge.
- Vannini, P. (2007) Social Semiotics and Fieldwork Method and Analytics. *Qualitative Inquiry*, 13(1), pp. 113-140.
- Vecchi, V. (2010) *Art and Creativity in Reggio Emilia: Exploring the role and potential of ateliers in early childhood education*. Abingdon: Routledge.
- Voloshoniv, V. N. (1973) *Marxism and the Philosophy of Language* (trans. L. Matejka & I.R. Titunik). New York: Seminar Press.
- Walker, R. (2012) Naturalistic Research. In J. Arthur, M. Waring, R. Coe & L. V. Hedges (Eds.) *Research Methods and methodologies in Education* (pp. 76-80). London: Sage.
- Wang, X. C., & Carter Ching, C. (2003) Social construction of computer experience in a first-grade classroom: Social processes and mediating artifacts. *Early Education & Development*, 14(3), 335-362.
- Welch, A. (1995) The self-efficacy of primary teachers in art education. *Issues in Educational Research*, 5(1), 71-84.
- Willett, R. (2007) Technology, pedagogy and digital production: a case study of children learning new media skills. *Learning, Media and Technology*, 32(2), 167-181.
- Williams, A., Kabisch, E., & Dourish, P. (2005) From interaction to participation: Configuring space through embodied interaction. In *Proceedings of UbiComp 2005: Ubiquitous Computing* (287-304).
- Wilson, B., & Wilson, M. (1977) An iconoclastic view of the imagery sources in the drawings of young people. *Art Education*, 30(1), 5-12.
- Wilson, B., & Wilson, M. (1979) Figure structure, figure action, and framing in drawings by American and Egyptian children. *Studies in Art Education*, 21(1), 36-43.

- Wilson, B. (2002) Becoming Japanese: *Manga*, Children's Drawings and the Construction of National Character. In L. Bressler & C. M. Thompson (eds.) *The Arts in Children's Lives* (pp. 43 – 55). Dordrecht: Kluwer Academic Press.
- Winner, E. & Gardner, H. (1981) The art in children's drawings. *Review of Research in Visual Arts Education*, 14, pp. 18 – 31.
- Wohlwend, K. E. (2009) Early adopters: Playing new literacies and pretending new technologies in print-centric classrooms. *Journal of Early Childhood Literacy*, 9(2), pp. 117-140.
- Wood, J. (2004) Open minds and a sense of adventure: How teachers of art & design approach technology. *International Journal of Art & Design Education*, 23(2), 179-191.
- Wright, S. (2012) *Children, meaning-making and the arts*. NSW: Pearson Australia.
- Wu, L. Y. (2009) Children's graphical representations and emergent writing: evidence from children's drawings. *Early Child Development and Care*, 179(1), 69-79.
- Wyeth, P., & Purchase, H. C. (2002, April) Tangible programming elements for young children. In *CHI'02 extended abstracts on Human factors in computing systems* (pp. 774-775). ACM.

Appendix A – Ethical Approval

31 July 2012

Dear Professor Connelly

UREC Registration No: 120642

Screened representations: what influence do new technologies have on the representational choices we make?

Thank you for your email of 27 July 2012 outlining your response to the points raised in my previous letter about the PhD study of your research student **Mona Sakr**, and attaching the revised documents. I am pleased to inform you that, on this basis, I have given Chair's Approval for the study to begin.

The UREC approval period for this study is two years from the date of this letter, so 31 July 2014. If you need the approval to be extended please do contact me nearer the time of expiry.

Thank you also for agreeing that UREC may use this application as an example of a good submission for future applicants to UREC on the basis that it would be fully anonymised.

In order to monitor studies approved by the University Research Ethics Committee, we will ask you to provide a (very brief) report on the conduct and conclusions of the study in a year's time. If the study is completed in less than a year, could you please contact me and I will send you the appropriate guidelines for the report.

Yours sincerely



Hazel Abbott

Chair of the University Research Ethics Committee

cc Dr Mary Wild - Second Supervisor

Mona Sakr - Research Student

Morag MacLean - Research Ethics

Officer

Jill Organ - Graduate Office