

# **Crystal Teeth and Skeleton Eggs: Snapshots of Young Children's Experiences in a Natural History Museum**

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**By Eleanor Siân Kirk**

## ***Abstract***

This thesis has two aims of equal importance: firstly to reveal the fine details of the typical experiences of young children visiting a museum; secondly to find a method of accessing these experiences in such a way as to prioritise the children's own perspectives, and to do so with a light touch, in order to minimise the impact on the visits. The research focuses on the experiences of 32 children, aged four and five years old, in their family visits to the Oxford University Museum of Natural History.

Drawing on the field of Childhood Studies, the project contrasts the effectiveness of several research methods for their potential use with young children in this setting, including children's drawings and tours. The final method involved using children's digital photographs of their visit as prompts for photo-elicitation interviews, thus providing both visual and verbal expressions of their experience. The major contribution of this thesis to museum visitor studies is its development and description of a highly effective, minimally-invasive method that richly documents children's experiences during the time of their museum visit using their own words and images.

The research adds to a small but growing field of study about young children's museum experiences with the addition of a detailed case study from a British natural history museum. Findings reveal children's navigations of the social and physical setting, their responses to different types of museum object and modes of exhibit display, and the highly varied ways in which they make sense of the things that they encounter in the museum. The thesis thus argues for a move away from a solely learning-focused view of young children in museums to one that sees them as visitors in their own right, who value many different aspects of their museum visits.

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# Chapter 1. Introduction

## *1.1 Snapshots from a museum*

It is the school holidays, and the Oxford University Museum of Natural History is filled with adults and children of all ages. A family with three young children, two girls of around seven and two years, and a boy of around four, are in the central court, overshadowed by two large dinosaur skeletons: an iguanodon, and a tyrannosaurus.<sup>1</sup> The older girl and boy are running excitedly from case to case, while the youngest girl's hand is gripped by her father, to stop her from disappearing into the crowd. The boy runs to his father, saying, 'Show you, show you,' takes up his father's free hand, and pulls him through the museum. The man first thinks that he is being shown the three elephant skeletons, and pauses by them, saying, 'Oh wow.' But the boy keeps dragging him onwards, into an aisle of reptiles, amphibians and fish, past a huge spider crab and giant tortoise, to the very last exhibit. It is a long, low glass case, sitting on the floor in the middle of the aisle, and containing a large, taxidermy crocodile. The older girl joins them, and all three children lean on the glass case and stare at the huge reptile together. Having paused here for a while, they together move on a short distance to a small taxidermy Shetland pony, which stands on a table with a sign next to it saying 'Please Touch'. The children stand together for a while, stroking the pony. Then the boy breaks away from the group again, and stops in front of a taxidermy golden eagle. The others follow him, and the man reads the label. So they carry on through the museum, the boy running ahead and excitedly shouting for them to see what he has found, the two girls and their father following behind.

Nearby, another father and his four-year-old son are also walking hand in hand. The father is pointing to various exhibits, and telling the boy facts about them. He points to the elephant skeletons, and says, 'That's the biggest land animal,' then points to the giraffe skeleton, and says, 'Do you know what that is?' But the boy is looking the other way, peering at the smaller specimens in the table-top glass cases. He sees a bat

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<sup>1</sup> Within this thesis, the names of all animals will be treated as common names, even those derived directly from taxonomic names, and as such will not be capitalised or italicised.

skeleton, gives a playful scream and grabs his father. Then he notices the giraffe skeleton that his father was trying to draw his attention to, and screams again. His father says, 'It's a giraffe.' Still holding hands, they walk alongside the parade of large skeleton mammals. The man continues to name each animal as they walk past; camel, deer, bison, pig... but the boy is looking in the other direction, still peering into the table-top glass cases that are on his side of the aisle. At the end of this row is a low case containing a beachball-sized brain coral. The boy shouts 'Brain!'. His father pauses briefly, but then continues walking.

Upstairs on the balcony gallery is a group of six: two women, three boys aged around six to eight years, and a girl of around four years. One of the women is looking into the geology cases on her own. The other is talking boisterously and making scatological jokes with the boys. The young girl is trailing slowly, several steps behind them all. At regular points along the corridor, positioned between the glass cases, are large, low, free-standing geological specimens that visitors can touch. Every time the girl comes to one of these rocks or fossils she pauses and briefly lies her head and hands on the cool rock. If the specimen is smooth, she strokes it. The last specimen in the row is a large, polished ammonite. She rests her head on it, holds onto the edges of it with both hands, and then strokes its glassy surface. She stays like this for a while, as the rest of the group chatter nearby. The woman with the group of boys carry on around the corner, but the other woman stops and waits, then picks up the girl, who cuddles into the woman's shoulder. They talk quietly for a while about a display of precious stones, and then I watch them as they disappear along the corridor and down the stairs.

## ***1.2 Research focus***

Scenes such as these are common in museums, and particularly in natural history museums. Young children<sup>2</sup> are an increasingly important museum audience (Graham 2011, p.54), and natural history museums are disproportionately popular with young families (Strager & Astrup 2014). This increase in the importance of young children as a museum audience has been matched by an increase in museum research focusing on this age group, with more than twice as many academic papers being written in this area

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<sup>2</sup> Defined in this thesis as children aged five years and under.

since 2000 as before the millennium (see Appendix 2: ‘Literature on young children and museums’). However, research with young children tends to focus particularly on what the children are, or could be learning in museums, and ‘little research has been conducted on what children seek or value from their experience of museums’ (Johanson & Glow 2012, p.29; see also Dunn 2012) or on what it is like for a young child to visit a museum.

In this research I am seeking to add to this small but growing field of literature about children’s museum experiences by answering two questions:

1. What are the experiences of young children on everyday visits to a natural history museum?
2. How can research methods access the experiences of young children visiting a museum?

More specifically, I am interested in the children’s experiences *during the time of their visits*. By taking this approach I highlight the texture of the museum experience and the range of ways in which children respond to the huge diversity of objects they encounter in museums, rather than attempting to demonstrate the longer-term impacts of museum visits. In addition, I am interested in the visit experience from the *perspective* of the children involved. Such an approach can richly and deeply reveal the significance of the visit for the children *themselves*, rather than searching for evidence of particular types of learning or meaning-making that museum professionals and researchers judge to be important. In this approach I adopt the stance taken by the field of childhood studies, in which children are seen as human *beings* rather than human *becomings* (Qvortrup 1987, p.5), the purpose of whose lives is not simply to become successful adults, but also to fully experience life as children.

In answering the second of the research questions, this thesis presents the evolution of a research project that made use of a form of photo-elicitation, a method in which photographs are used to prompt responses from interview participants. In this particular case digital photographs were taken by four- and five-year-old children as they visited a museum with their families, and these photographs then immediately used as the basis for interviews with the children. In addition to being interview prompts, the photographs have become a rich source of data in themselves, which serve as a non-

verbal form of expression for the children, and thus respond to the call from Piscitelli and Anderson that museum research needs to include the ‘voices and visions’ of young children (2001, p.271). While photography has been used previously in museum research with young children, the approach used in this project, in which all research is carried out during the time of the visit, is novel for being extremely light-touch and undistruptive towards the children’s visits, whilst also forcing the research to focus on the visit itself, without reference to the later impact of the visit on the children. The method used therefore aims to show *what it is like* for young children visiting a museum.

The research has been carried out at the Oxford University Museum of Natural History, one of the four museums associated with the University of Oxford. This is a medium-sized museum, displaying a large collection that includes geology, prehistoric life, and modern animals and plants. This museum was particularly suitable as a case study for a number of reasons. Firstly, its size means that it was both large enough for children to have rich and varied experiences within it, but not so large as to render the research impractical. Secondly, this is a very popular museum with families (which in 2005 won the Guardian Family Friendly Museum Award, administered by the charity Kids in Museums), which meant that a large number of young children were available to potentially participate in the research. Thirdly, the museum displays a large number of handling collections, which visitors can touch, and which therefore allows the research to explore a greater range of ways in which children are able to engage with objects in the museum. A map of the museum can be found in Appendix 3. (‘Plan of Oxford University Museum of Natural History’) and a more detailed description of the museum in section 4.2.

### ***1.3 Overview of thesis structure***

This thesis is divided into a further eight chapters. Chapter two reviews the literature on young children and museums, with a particular focus on the relationships between research agendas, methodologies and findings. As stated above, current research has a strong predisposition towards viewing young children as learners, and this chapter begins by presenting the ways in which this concern has manifested itself in the research from across the English-speaking world. Research from the USA is shown to be very much focused on family learning conversations and the responsibility of parents

for their children's museum learning; research from Britain and Europe tends to take a more instrumental approach in which museums are seen as having a responsibility to support children's school learning and respond to government policy; while research in Australia and New Zealand has attempted to show through the use of exemplary projects how museums can more broadly support young children's learning. These learning-focused research agendas are together compared with approaches that attempt to gain children's own perspectives on museums. This research can either take the form of child-led consultations about museums, or, more rarely, can involve open research questions that attempt to understand the experience of being in a museum for young children. This thesis is placed within the latter of these fields, in which there is currently a lack of literature about the everyday experiences of young children visiting British natural history museums with their families.

This thesis is as much focused on discovering methods that can be used to understand children's experiences from their perspective as it is on the experiences themselves. Chapter three begins with a discussion of the theoretical basis for the methodology, which aims to ensure that the research was led by the perspectives of children about their everyday experiences within the museum. To this end it has drawn on the field of childhood studies (James & Prout 1997), and more specifically on the educational approach of Reggio Emilia (Edwards et al. 1998; Rinaldi 2005) to provide a view of young children as people who have a right to be consulted about their experiences and who are able to express themselves competently in many ways. Theoretically, this methodology also draws on ethnography to provide a focus on rich data, and grounded theory (Glaser & Strauss 1968) to provide a structure to the research method to ensure that the analysis is led by the data. The theoretical section of the chapter is followed by a more practical discussion, firstly of the challenges of carrying out research both with young children and in museums, and secondly of the methods available for carrying out research with children in these settings. The chosen methods were drawn in a large part from the mixed-methods Mosaic approach (Clark & Moss 2001), and consisted of interviews based around children's drawing, tours and photography, as well as observations, all of which have some precedent for use within museum settings. The chapter ends with a discussion of the steps taken to ensure that the research was carried out ethically.

Chapter four presents the pilot study, carried out over three museums, which tested the above methods with children visiting the museums with school and family

groups, and which led to the rejection of a mixed-method Mosaic-style approach in favour of photo-elicitation exclusively. The pilot study was a vital stage in the development of this final successful methodology, and the outcomes of the pilot study are described in some detail to provide justification for the approach being narrowed in this way, and to show the reasons for the success of photo-elicitation interviews compared to the less successful outcomes from interviews based around children's tours and drawings. The richness of the data produced through photo-elicitation is demonstrated through an in-depth description of the first interview that was successfully carried out using this method at Oxford University Museum of Natural History, with a five-year-old boy, Kyle. The final methodology involved children taking photographs with a digital camera as they visited the museum with their family, and then choosing some of these pictures to discuss during their interview. As well as the narrowing of the methodological approach, this chapter also describes the subsequent narrowing of the research focus to include children from a smaller age range, and to exclude school groups in favour of family visitors.

Having set forth the development of the methodology, chapters five to eight are concerned with the analysis and discussion of the data, which begins with an overview of the types of data produced, including nearly sixteen hundred photographs, as well as interviews with 32 children. The data were produced during the family museum visits of a small number of children, and this chapter goes on to discuss the repercussions of data produced in this way, including the ways in which it can be called up to be representative of a child's everyday museum visit, the ways in which visual data can be seen to 'speak' alongside verbal data, and the impacts of both family members and myself as researcher on the production of data about the children's own experiences. As in chapter three, this theoretical section is followed by a more practical discussion of the approach taken in the analysis of data, and the tools used to allow a deeper understanding of the visual and verbal data, including the software NVivo and DevonThink Pro. Finally, the chapter explains the framework used to structure the following three chapters of the analysis. As is commensurate with an approach inspired by grounded theory, this framework was developed through the analysis of the data, and in doing so attempts to break down the children's museum experiences in such a way as to give weight to both the learning and the non-learning aspects of the experience.

The framework used to structure chapters six to eight divides the children's museum experience into three elements: the navigating and negotiating of the physical

and social settings; the ways in which aspects of the museum ‘light up’ for the children; and the ways in which they make sense of the things they encounter in the museum. Chapter six begins with the first of these elements: navigating and negotiating. This chapter uses the photography, interview and observation data to show the ways in which the children purposefully navigated the larger physical space of the museum, and also how they used (and sometimes didn’t use) touch to explore the properties of the museum objects. However, as well as navigating the physical space, children’s visits were also dominated by their having to navigate and negotiate the social space that they inhabited with their families. The social aspects of the visit are shown to have been characterised by negotiations around control, independence, personal influence, and understandings of museum social rules, all of which had the potential to lead to small conflicts between children and their families. In spite of this, children’s navigations and negotiations are generally seen to be successful, and form the basis of the rest of their museum experiences.

Chapter seven uses the metaphor of ‘spotlights’ to discuss the ways in which children attend to the various exhibits within the museum, the influences on these spotlights, and the intensity of the spotlights on different types of objects. An analysis of the photographs shows which areas of the museum and types of object appeared to be salient to the children. When combined with the interview data, this shows the objects that were meaningful enough to be both photographed and discussed by the children. These attentional spotlights are shown to be directed by a number of factors, including the children’s personal interests, other members of their group, and also by the methods of display employed by the museum. The ‘lighting up’ can also vary in intensity, and while the patterns and intensities of attention are different from child to child, there are several types of object that were found to light up with a degree of consistency across the group. Some of the most intensely salient objects in the museum were the predatory animals, and the specific pattern of children’s attention around these objects concludes this chapter.

While this thesis has attempted to move beyond a museum-centric learning lens through which to view children’s experiences, learning was found to be an important aspect of children’s agendas and motivations during their visit. The final chapter of the analysis therefore explores the ways in which children make sense of the objects they encounter in the museum, and incorporate them into their understandings or views of the world. This is an extremely well theorised area of museum studies, and is therefore

treated with a light touch in this thesis, which, rather than attempting to give a deep analysis of children's learning, seeks to show the place of learning within the broader museum experience. The chapter begins with an analysis of the social aspects of learning, and the influences (positive and negative) that both parents and siblings have on young children's meaning-making. The process of 'making sense' is divided into two sections: categorising and connecting. Categorising was found to be the most common of children's responses to museum objects, which could involve naming, describing or both. Children were highly motivated to categorise objects in this way, but their ability to do so was very dependent on their developing language skills, so that children could be knowledgeable about certain objects without being able to name them. Gender was also found to be significant in affecting how children described the museum objects. This section ends with an analysis of some of the highly varied ways in which the children made connections between the museum objects and other areas of their knowledge or experience, including a discussion of children's 'islands of expertise' (Crowley & Jacobs 2002), the comparisons that children drew between museum objects, their understandings of the animals as 'real', and the implications of some of their *mis*understandings.

This thesis aims to both understand the everyday experiences of young children in a natural history museum and to find a light-touch method that allows these experiences to be collected during the time of the children's museum visit. The concluding chapter is thus divided into two main sections, the first of which discusses the usefulness of this particular method of photo-elicitation, and the second of which reflects on some of the findings about children's museum experiences. The thesis ends with a discussion of the possible ways in which the research could open up new avenues for our understandings of and work with young children in museums.

## Chapter 2. Literature review

### ***2.1 Overview of the literature***

This chapter explores the ways in which researchers have chosen to investigate young children in museums. Research with young children is illuminating not only of the children but also of the researchers themselves and the way that they perceive both children and the museum. This review compares the research approaches of three geographical areas: the USA, Britain and Europe, and Australia and New Zealand, to discuss how factors such as research agenda, research questions and methodology lead to researchers focusing on particular aspects of the children and their museum visits. While there is some overlap between the approaches of these areas, there is enough difference to treat them separately, and making distinctions between these traditions can more usefully highlight the significant themes and questions. These differences of focus include the social context of children's visits, visit outcomes including learning, memory, interest, enjoyment, and the degree to which the research attempts to take the child's perspective.

The review is limited to studies and articles that include or discuss children between three and five years of age visiting museums, although many of the reviewed studies also include children who are older than this, and a smaller number include babies and toddlers. The discussion of these studies will not, however, focus on children who are significantly older or younger than the chosen age group, as the aim is specifically investigate the approaches that researchers take to working with children at this particular developmental level. However, while this thesis focuses on natural history museums, the literature review does include research from a wider range of museums, including science, art, history, culture and children's museums. This is because questions of method are more dependent on the limitations of working with this age group in this *type* of setting than they are on the subject matter of the museums in which the studies are carried out. This review focuses both on the methods use by researchers, as well as their findings. A table summarising the literature by country,

museum type, group type and age of children can be found in Appendix 2 ('Literature on young children and museums').

## ***2.2 Young children's learning in museums***

The majority of the research into young children and museums is educational in approach, and is based upon constructivist or social constructivist perspectives, in which visitors are seen to make sense of the information in the museum based on their own prior knowledge and experience (Hein 1998; Anderson et al. 2003). As this approach to learning is extremely well theorised and documented, this review will therefore not discuss it further. Section 2.2 reviews the literature that has grown out of the concern for young children's learning in museums.

### *2.2.1 The American tradition: conversation & scaffolding*

There is a large body of work on young children in museums stemming from the USA, which focuses almost entirely on family learning, sees learning as inherently social, and tends to be based particularly in science, natural history and children's museums. This tradition itself originates from research in the 1970s and early 80s into family behaviour in museums (summarised in Kropf 1989; see also Diamond 1981). This research attempted to classify the behaviour of families in museums and to discover 'why families are visiting museums and what they are doing when they get there' (Dierking 1989, p.9), and was very much driven by a desire to make museums better places for families to visit.

Coming out of this very observation-based behavioural research, museum professionals themselves began to describe and reflect on what it was that made their settings so suitable for families, to advocate museums as places for families to visit, and to call for more in-depth research into the ways in which museums could support families learning together (Laetsch 1982; Wurtak 1987; Feder 1989; Butler & Sussman 1989). By the end of the 1980s research into families in museums had therefore expanded to take on the dual agendas of investigating both family behaviour and family learning (Dierking & Falk 1994, p.57; see also Dierking 1989; Kropf 1989). Museums began to be described as 'informal learning settings' (Dierking 1989, p.9) and researchers became interested in measuring how and what families learned together

(Dierking 1989; Wolins 1989; Dierking & Falk 1994; Borun et al. 1995). If museums could understand how families used them, and what families agendas were in visiting them, then the museums could better achieve their objective of being effective learning institutions, by accommodating, rather than fighting, the needs and behaviour of families (Dierking 1989).

The dual agenda of behaviour and learning led theorists to adopt a social model of learning in museums, in which the interactions between parents and children were seen to be key to the children's learning in museums, and therefore to the perceived success of the museum visit. This went beyond Wolins's early suggestion that the goal of museum educators is 'to generate shared meanings through experiences aimed at all family members' (1982, p.2). Learning was now not only seen as something that each member of a family would do individually, but rather as something that families specifically do together as social groups, with older family members in the role of teachers, and children as learners, so that 'the individual's learning experience is enhanced and shaped by input from other family members' (Borun et al. 1996, p.135). This sociocultural model of learning is heavily influenced by theorists such as Vygotsky and Bruner (Wood et al. 1976; Wolins 1989; Haas 1997), and the proposition that learning occurs through a process of 'scaffolding,' in which the learner is guided by someone more knowledgeable than them through a 'zone of proximal development', defined as 'the distance between the actual developmental level [...] and the level of potential development [...] under adult guidance' (Vygotsky 1978, p.86). Influenced by the Vygotskian assertion that language is the pre-eminent tool for teaching and learning (Ash et al. 2007, p.1582), museum researchers in the USA have focused much of their attention on conversations between family members, as evidence of the social learning processes that are taking place.

It is worth noting here that, while the researchers were concerned to categorise and discover the factors affecting children's learning, and while they drew on developmental psychologists such as Vygotsky and Piaget, the earlier studies tend not to distinguish differences in behaviour or learning according to age or developmental level (e.g. Laetsch 1982; Dierking & Falk 1994; Haas 1997; Crowley & Callanan 1998) although gender and generational differences were measured and considered significant (Blud 1990a; Blud 1990b; Borun et al. 1995; Crowley et al. 2001). Even in Borun et al.'s (1996) study of families in a science museum and a zoo, while the differing needs of younger children were acknowledged by interviewing families in age order so that

these children were not influenced by older family members, the final results do not make distinctions between the learning approaches of families with different aged children.

This changed towards the end of the 1990s, with the development of a meticulous dialogic research method, based largely around the close analysis of conversations between parents and children, and continuing to build on sociocultural models of learning. This later research accounted for variables including children's age, adult relationship with the child, adult educational level, museum type and exhibition style; and outcomes including amounts and content of conversation, conversational strategy, depth of learning and so on (Melber 2007; Sanford et al. 2007; Siegel et al. 2007). Young children have been well represented within this dialogic research, with some studies focusing specifically on this age group (Shine & Acosta 2000; Callanan et al. 2002; Ash 2004a; Ash et al. 2007; Melber 2007; Palmquist & Crowley 2007), while others cover a wider age range that includes young children (Borun et al. 1996; Crowley & Callanan 1998; Sanford et al. 2007; Siegel et al. 2007; Dooley & Welch 2014). An important advantage of focusing on conversation has been that this method can be used with any visitors who are old enough to speak, and so can just as effectively work with toddlers as with children who can read and write.

At the core of all of these studies is a methodology based around close observation of the verbal content of the interaction between adults (usually parents) and children in the museum. These observations may be written out by hand, unobtrusively or covertly (Shine & Acosta 2000; Dooley & Welch 2014), but many more involve audio or video recordings or both, with the consent and cooperation of the participants (e.g. Borun et al. 1996; Crowley & Callanan 1998; Palmquist & Crowley 2007; Ash et al. 2007; Melber 2007). Often these groups consist of adult-child dyads rather than larger groups as a way of simplifying the recording process. There is evidence that this approach has helped museums to become more effective learning environments for young children, with Wolf and Wood (2012) arguing that a focus on family interactions rather than individual children allows museums to evaluate the effectiveness of their galleries for encouraging parents to help scaffold children's learning experiences. They describe how, at the Children's Museum of Indianapolis, this focus on family learning has led to increases in dwell time and a subsequent increase in learning conversations between parents and children.

These studies have revealed many of the characteristics of the content and structure of family learning conversations. In terms of content, typical results show that families engage in only moderate learning, talking about concrete, visible aspects of exhibits (Borun et al. 1996), and that children's learning was most effective when it embodied 'something novel, cognitively complex, and generalizable outside the museum walls,' (Haas 1997, p.67). In terms of the structure of conversations, studies tend to strongly support a standpoint that places parents in the key role of teacher. Crowley and Callanan state that '[o]ne of the arguments often advanced in favor of a child-directed model is that individual discovery is the most powerful form of learning', which they dismiss as 'a romantic notion' (1998, p.13), going on to suggest that 'the most potent hands-on exhibits are those that recognize and support the collaborative learning of parent-child interactions' and that 'children's learning can be undermined when exhibits lead children and parents to adopt competing learning goals' (1998, p.17). Likewise, Haas states that 'adult supportive interaction in the form of developmentally appropriate, open-ended questions is critical' (1997, p.67).

Research relating to adult teaching strategies includes studies by Siegel et al. (2007), who, in work with Spanish-speaking families in an American science museum, found that parents educated to a higher level used more directive language, and that parents were more likely to be directive rather than collaborative with younger children (three to five years) than with older children (five to nine years). Dooley and Welch found that children's interactions consisted mostly of asking and prompting, which the authors refer to as 'show and tell', while adults explain, comment, prompt and label (2014, pp.129–130).

Much of the research is concerned with science learning, and attempts to measure children's development of scientific skills and concepts. Crowley and Jacobs (2002) recorded conversations between parents and four- to twelve-year-old children as they interacted with fossils at a table in a children's museum. They found that, particularly for younger children, the extent to which their parents read labels and linked information in to the children's prior knowledge was associated with higher levels of fossil identification. And Ash (2004a) found that families with young children often use personification during their conversations about animals in museum dioramas, and that this was often a starting point for more scientific conversations. She noted that the frequency of questioning from adults was not necessarily a marker of the depth of scientific conversation, with some parents using questions as a 'check for prior

knowledge' rather than to encourage enquiry in their children (2004a, p.91). Ash also describes the way that parents build on children's existing knowledge, so that they are always working within Vygotsky's zone of proximal development: the area of knowledge within which children can work with help from others.

Callanan et al. showed that learning is not necessarily easy or straightforward for this age group, and that young children can struggle to understand the meaning of some objects in museums. Focusing on conversations between parents and young children about maps, globes and videos, they found that, while very young children had difficulties in understanding the meaning of these representational objects, 'parents talked to young children as if the children understood representational objects for what they are' (Callanan et al. 2002, p.280). The result of this was an internal conflict for the children, in which, to make sense of what their parents were saying they had to 'begin to search for another way to think about the objects with which they are interacting' (ibid.). In this way, '[c]hildren's conversations with parents serve as a setting for children to figure out the notion of an object that serves as both object and symbol' (ibid. p.281).

The dialogic approach to research has also expanded beyond being concerned specifically with promoting or advocating parental teaching behaviour. Shine and Acosta's study showed how parental concern with teaching can actually *interfere* with children's desire to engage in role play. Their study of family conversations in a pretend grocery store in a children's museum, showed that parents were more inclined to focus on learning opportunities such as counting, and that these attempts to teach 'interrupted or inhibited [the children's] pretend play' (Shine & Acosta 2000, p.47).

While most studies now distinguish between children of different ages (as earlier studies distinguished between gender), it is less common for them to make other distinctions between the children they are studying. One study which has attempted to do this is Palmquist and Crowley's (2007) investigation into five- to seven-year-old children according to their varying levels of expertise on the subject of dinosaurs, in which they used children's ability to name dinosaurs as a way to separate the children into 'experts' and 'novices'. They found that the children's expertise in dinosaurs was *not* connected to how often they visited the museum, and there were not significant differences in the visiting behaviour of expert and novice families in terms of how long they spent in the gallery or what they looked at. What they did find was that, although 'expert' and 'novice' children spoke equal amounts in the museum, the parents of

‘expert’ children were actually less likely to talk to their children than the parents of ‘novice’ children. They suggest that ‘as children develop an island of expertise in dinosaurs, their parents become less active contributors to learning conversations’ (Palmquist & Crowley 2007, p.797), and that this may be because the museum is not encouraging a high level of thinking. This study therefore suggests that understanding how a museum can best serve young children depends not just on a general understanding of this age group, but also a specific understanding of differences between children, for example in terms of the range of their knowledge and how this affects their visit.

Working from the standpoint of parents as teachers, many of the studies, as well as recording conversations, have also used interviews with accompanying adults to focus particularly on parents’ intentional strategies for supporting or scaffolding their children’s learning. So, for example, in a natural history museum-based study, Melber (2007) both observed mother-child dyads in the museum and interviewed the mothers, and found that mothers were more likely to use high-level conceptual dialogue in a traditional exhibition than in a discovery room, as they perceived that their children needed more support in the former than in the latter. Sanford et al. (2007) worked with grandparents and grandchildren (aged five to twelve years) visiting a science museum, testing and observing the family interactions, and then interviewing the adults afterwards. This study suggested that the conscious museum teaching strategies of grandparents were not substantially different from those of parents.

While adults have been interviewed about their conscious decision-making in their teaching strategies, the children themselves have instead been tested, either on their own, or with family members, for their knowledge gains or approach to learning in the museum (Haas 1997; Palmquist & Crowley 2007; Sanford et al. 2007; Siegel et al. 2007). So, for example, in an early study that took this approach, Haas (1997) observed children and parents in the museum, then carried out an experiment to test the children’s responses to different levels of adult encouragement, and then carried out focus groups with parents, teachers, and older children who had outgrown the museum. This way of working strongly suggests a belief on the part of the researchers that young children can only effectively express themselves through their outward actions while they are actually in the setting of the museum, whilst older participants can recall and reflect on previous experience.

What many of these studies therefore lack is a sense of the perspective of the children. Children's voices are certainly present in the conversations, and their learning is present in the tests, but their internal perspectives and experiences are not present, even though the perspectives of accompanying adults often are. So, for example, in Sanford et al.'s (2007) study of grandparents and grandchildren visiting a science museum, the researchers observed and tested the children and grandparents together, and interviewed the grandparents. However they did not ask the grandchildren whether, for example, visiting with their grandparents was different for them from visiting with their parents. And Melber's (2007) study, whilst using interviews to find that mothers chose to make greater use of higher-level conversation in traditional exhibitions than in discovery rooms, did not investigate whether the children themselves were independently engaging with the discovery rooms in spite of their mother's lack of conversational support in this environment. What this means is that the dialogic approach puts the onus for children's learning firmly with the adults, highlighting differences in adult teaching and scaffolding strategies, rather than exploring differences between the ways in which children interact with the museum. This can be the case even where differences in children's ability are noted. Thus, in Palmquist and Crowley's (2007) study of children's 'expert' and 'novice' ability on the subject of dinosaurs, the focus of their study was the subsequent differences in teaching strategies of parents depending on their child's level of knowledge.

### *2.2.2 The British and European tradition: supporting learning and development*

In some ways, the growth of British research into young children in museums has mirrored that in America, drawing as it does on visitor studies and taking a largely sociocultural perspective on the nature of learning. This overlap is unsurprising, as the two countries draw heavily on each other's research literature, although the British literature does not really begin in earnest until the 1990s. However, in general, while the American tradition reflects a concern with parents' individual responsibility to support their children's learning, the British tradition has been more focused on the ways in which museums can serve and support school learning and the aims of certain government agendas (in particular those of the New Labour government 1997-2010)

relating to young children's development. This section of the literature review also covers a small number of studies from Europe, which are included in part because they have similar concerns to the British publications, and in part because the researchers and the studies often straddle both Britain and mainland Europe. As this review only includes studies published in English, it is not clear whether similar concerns are held by European researchers who publish in other languages, or who are less connected to British research.

Commenting on her early British visitor research at London's Science Museum, McManus (1994) implies that one of the main defining features of young children visiting museums was their 'prosaic needs' for facilities such as lockers and toilets. Citing unpublished American research by Hilke and Balling she suggests that family learning strategies do not differ according to the age of the children, although she does call for more research 'where variations in the ages of children, and therefore stages of development, were taken into account' (McManus 1994, p.95). Work had already begun, however on young British children's museum learning. Moffat (1992) summarises (although unfortunately does not name) an evaluation of provision for young children in English museums carried out in 1990 by Her Majesty's Inspectorate in the Department of Education and Science. The survey aimed to demonstrate the ways in which museums could support the objectives of the newly instated National Curriculum. School children aged from five to nine years were observed first in museums and then back at school, to evaluate the ways in which their education benefitted from visiting museums. Moffat summarises the findings thus:

Young primary school pupils in England gain greatly from their visits to museums and from the wide range of experiences museums offer. The children learn how to focus their attention in different surroundings. They learn to look, describe, speculate, and explain. Their work in a variety of areas of the curriculum benefits from increased knowledge and enthusiasm. (Moffat 1992, p.4)

Moffat's list of perceived benefits is heavily weighted towards supporting school learning, and for the youngest children goes on to include extending language and vocabulary, understanding how things change over time, and learning about the rules of behaviour in museums. As this suggests, the adoption of a National Curriculum made the educational objectives of schools across the country visible to museums, and has

ever since given an impetus to researchers to demonstrate how museums can support schools in achieving these objectives.

The work of Sue Dale Tunnicliffe and her collaborators has likewise aimed to understand the ways in which museums can support children's school learning, although with a particular focus on the natural world, so that this information can be used 'as the baseline around which we design and implement educational strategies which help children in their construction of zoological knowledge' (Tunnicliffe 2000, p.739). Superficially similar to the American research, her approach has largely, although not exclusively, involved close analysis of children's conversations. However, her reason for doing this is subtly different from that of the American researchers: rather than seeing dialogue specifically as the mode in which learning takes place, she sees conversations as something that 'can reveal a great deal about the thought processes of participants' (ibid.). Also unlike the American dialogic research, these conversations are not necessarily between adults and children, but include peer-to-peer conversation, which can give insights into children's responses that are not necessarily present in adult-child interactions. Her research is extensive and relevant enough to this thesis to justify paying it particular attention.

Tunnicliffe's doctoral research (1995) focused on recordings of conversations of children aged from three to twelve years of age, visiting museums, zoos and farms in Britain and the USA, in both school and family groups. The most relevant of her extensive findings for the purposes of this literature review are her comparisons of the conversations of school children aged under and over seven years. She found the conversations of these two age groups to be surprisingly similar, with a few notable differences: younger children categorised more, and had a more concrete approach to investigating the environment (e.g. through touch), while older children displayed more emotive attitudes (e.g. towards animal welfare). She notes that children of all ages were concerned with the 'realness' or authenticity of the animals they were looking at. However, this was not a straightforwardly developmental phenomenon, with both younger and older children displaying this concern, but to different degrees in different settings. Younger children were more interested in the authenticity of animatronic dinosaurs, while older children's concern with authenticity seemed to be provoked more by taxidermy animals.

More recently, Tunnicliffe and her co-researchers have continued to investigate children's nature learning, using further conversational research with school groups and

occasionally families in British museums, farms, zoos and schools (Tunnicliffe 2000; Tunnicliffe & Reiss 2000). However, within a broad span of research across all ages of children, young children feature only at the lower end of a small number of these research projects. In one study, for example, children under six years accounted for just over 10% of the data (Tunnicliffe 2000, p.745).

Extending Tunnicliffe's original research, these studies have provided evidence of young children's powerful drive to name and categorise animals, and also their tendency to talk about the animals in terms of visible features and the children's existing knowledge of those animals (Tunnicliffe 2000). In common with the American research, Tunnicliffe and Reiss also reveal the paucity of scientific discussions from parents accompanying the children.

The museum conversations analyzed here suggest that far less scientific learning takes place than could be the case. Rather than being taught much in front of the specimens, children simply used their everyday knowledge and understanding to interpret what they saw and to allocated everyday names using anatomical clues as their guide.' (Tunnicliffe & Reiss 2000, p.136).

There are two further studies from Europe that explore how museums can support children's school learning. In the first of these, Savva and Trimis (2005) investigated five and six year old children's learning in a contemporary art gallery in Cyprus, asking how the museum visit was linked to art learning in the classroom. They used observations (including with cameras and videos) of the children in the gallery, and interviews with the children both in the gallery and back in school. The researchers found that the children had a preference for sculpture over painting, and, as has been found in studies in other museums, that they made sense of the art according to it's physical properties, particularly size, material and bright colour (e.g. Danko-McGhee 2006), and according to their previous experiences of art in museums or artists' studios. They also found that the visit to the museum influenced the children's own artworks in school, which were either reproductions of what they had seen, or used similar techniques or materials. They argue that '[l]earning to look at art is a skill that requires time and effort' and that 'repeated visits to museums [...] should be an important component of art learning' (Savva & Trimis 2005, p.13).

Synodi (2014) uses Early Childhood Education approaches to explore the effectiveness of museum education programmes for school children in Britain and Greece. Starting from the premise that ‘power sharing improves children’s participation in and interaction during the activities and children’s autonomy in choosing activities [...] which provoke children’s thinking and reflection’ (Synodi 2014, p.119), she investigated how developmentally appropriate the educators’ communication methods were, with specific reference to the power balance between the educators and the children. She found that, while the British museum educators used more developmentally appropriate language than did their Greek counterparts, in both countries the balance of power was firmly in favour of the adults, with children not able to make any decisions about the course that the sessions took.

As well as academic research, museum professionals and consultants have added to the British literature with evaluations and reports, which are generally concerned with making museum programming more appropriate to the needs of young children. Very often, these documents have an advocacy role at their heart, either persuading museums that they should make provision for the early years (Blackwell 2009; Graham 2008b), or promoting museums to early years practitioners and policy-makers as a resources for working with the early years (Graham 2008a). While it is not necessary to go as far as Selwood (2006, p.46) in renouncing this ‘grey literature’ as incompatible with academic research, the lack of neutrality does mean that these documents can not be treated in quite the same way as peer reviewed academic research. Additionally, while these documents are certainly based on research, the data collection methods are not the main concerns of either the writers or the intended audience, and are therefore rarely described in enough detail to make comparisons between the studies (for example they do not state the numbers or ages of the participants, how they were recruited, or how the data was collected and analysed). However, this grey literature does give a sense of the policies and practices that influence museums’ work with young children, and in addition provides some sense of the ways in which children relate to and benefit from museums.

Consultant Jo Graham has been a driving force in making British museums more aware of the needs and potential of young children as museum audiences. This is not academic research, but is practical evaluation and consultation, designed to give museums ideas of how they can work with this audience. In particular, Graham has used the Early Years Foundation Stage curriculum as a framework within which to

demonstrate the age-appropriate programming that has been developed and implemented by museums (2008b). She has also trialled the use of various tools (for example torches, magnifying glasses and binoculars) for young children in museums, to encourage play, hands-on learning and communication between families (2009). Graham also uses her evaluations to promote museums to childcare settings and nursery schools, for example in the report 'Close Encounters with Culture' (2008a), in which she uses snippets of children's 'learning journeys' as a way of convincing childcare workers of the value of museums to young children's learning within the Foundation Curriculum.

Blackwell's report into 'Communication Friendly Museums' takes a more instrumental role, building on the New Labour agenda of addressing speech delay in children (2009). The report is the evaluation of a funded project in which museums in the British midlands developed provisions for families with young children (such as handling collections, puppets and family-friendly gallery seating), with a specific focus on communication. Although the data collection methods are not clear, the report does suggest that when the museums changed their interpretation to encourage communication, this had the knock-on effect of increasing dwell time, making the museums more welcoming, and attracting families from a wider range of social backgrounds (Blackwell 2009, pp.10–11).

Reports such as these came at a time when many museums in the UK began to take young children seriously as an audience. Rossi-Linnemann (2010) reviewed British and European museums' approaches to working with young children. Following a similar vein to Graham and Blackwell, she advises museums that the needs of young children and their families include: safety and security; opportunities for multiple learning styles and multi-sensory learning; play; communication and interaction; inquiry and investigation; and a mix of familiarity and novelty (Rossi-Linnemann 2010, p.28). The British and European museums that she reviews all make provision for young children that is in addition to their core exhibitions, including spaces for young children, learning resources, role-play activities and age-appropriate interpretation of the galleries.

### *2.2.3 The Australian & New Zealand tradition: Exemplary museum programmes*

While there has been some straightforwardly evaluative research carried out in Australia (e.g. Speering et al. 1997), the research in this region is dominated by an alternative approach, which has been led by the Queensland University of Technology Museum Collaborative (QUTMC) project (e.g. Piscitelli & Anderson 2000), and which borrows more from art education than from museum visitor studies. Methodologically, this project differs from those described above in a number of key ways. Firstly, the team worked almost exclusively with schools, and all of the children participating were between four and six years of age, so that the project focused on a much narrower developmental range than many British and American projects. Secondly, the children's involvement in the project lasted over several months and involved visits to a number of different local museums, including art, science, history and natural history (Piscitelli 2001), as well as museum-themed sessions during school lessons. And thirdly the project made use of a wide range of methods that allowed children to express themselves creatively as well as through observations and interviews.

From a theoretical perspective the project differs, particularly from the American dialogic approach, because the focus is more directly on the children themselves, rather than on the responsibilities of their adult co-visitors or the museum staff. This is not to say that the social context is not acknowledged, but rather that it is seen to be part of the 'lived experience of young children as visitors to museums' (Piscitelli et al. 1998, p.17). The aims of the research were 'to advance basic knowledge of children's learning in museums incorporating investigative techniques, with a view to maximising the learning potential of young children visiting museums' (Piscitelli & Anderson 2000, p.4) and to 'explain ways in which young children become enculturated into the world of museums, how and what they learn, and the values they (and their families and schools) ascribe to their museum-based experiences' (Piscitelli 2001, p.224). Theoretically the project explored cognition, motivation, and socio-cultural, collaborative and aesthetic learning (Piscitelli 2001).

Within this study, the broadness of the research questions were also reflected by the broadness of the data collection methods. These were very much influenced by art education (Piscitelli 1997, p.20), and included observations and recordings of children *in* the museum, and then interviews and creative methods such as drawing to provide

age-appropriate modes of expression for the children to demonstrate their recollections *after* their visit (Piscitelli & Anderson 2001, p.273). The aim of these methods was to allow children's 'voices and visions' to be included in the research (Piscitelli & Anderson 2001, p.271). The pilot and main projects together worked with 179 children from a number of schools and nurseries (Piscitelli et al. 2003, p.9), and during the main project the children each had around 40 hours contact with the research team (Piscitelli 2001, p.224). The project structure essentially involved the creation of an exemplary museum programme for young children, in which, over the course of a year, children were taught about the concept of museums, took part in several trips to different museums, and created a museum of their own. The range of methods, and the length of the study, has led to a broad and rich range of findings, but still with the focus on children's education, with the aim of finding ways of making museums more effective places for children's learning (Piscitelli et al. 2003).

Reflecting on the outcomes of this project, which allowed children the opportunity to visit several museums and to have numerous school lessons devoted to learning about and discussing their experiences in museums, the researchers summarise their findings thus:

The project was very satisfying for all involved. Children enjoyed finding new ideas in museums, parents gained new skills in guiding young children's learning, teachers found ways to link the museum with the classroom curriculum and museum staff discovered new strategies for designing programs and projects for the early years audience. (Piscitelli et al. 2003, p.10)

While Zapri criticises the assumption that young children are 'happy and enthusiastic museum visitors,' (2004, p.66) it is maybe unsurprising, given that this is essentially a long-running action research project to explore the potential of museums, that children should have had a positive experience during the QUTMC project.

The project, and other studies carried out in a similar manner by the same team, have highlighted a number of different aspects of children's museum visiting from the dialogic research of the USA, including the ways children express their choices and interests while in the museum, the ways that they engage with the museum physically and with their senses, and the outcomes of the visits in terms of memory and learning. An early study showed that children responded most favourably when they were

allowed to ask their own questions and respond personally during museum tours, and when they could listen to and make up stories about the artworks (Piscitelli 1997). During the main study, children ‘led tours, revisited their favourite objects and pursued activities of their choosing’ (Piscitelli et al. 2003, p.15). The researchers found that giving children the power to make decisions heightened their enthusiasm for the museums, and that during the tours that the children gave to their parents, the children demonstrated high levels of intelligence and understanding in the ways that they related to museum objects (Weier 2004). In this way, the research also revealed how children could become empowered to make use of and express themselves in museums, allowing them to ‘learn actively from the artworks (through inquiry) rather than passively about them (through listening to ‘facts’ or fixed meanings)’ (ibid, p.115). Piscitelli & Weier (2002) advise that for young children to benefit from art museums, they need to visit multiple times and to actively engage in their own interpretation through the creation of artworks. Indeed, building on the positive responses of children to this prolonged engagement with museums, this work in general advocates long-term projects and programmes for young children visiting museums (Anderson et al. 2002).

In terms of bodily, affective and sensory engagement, the QUTMC researchers promote the idea of children entering museums ‘with a sense of wonder, a playful attitude, strong sensory awareness, developing aesthetic sensitivity, willingness to explore [...] and some personal preferences about what they like or dislike’ (Piscitelli 1997, p.2). Observations revealed a deep level of physical engagement, with children demonstrating the ‘importance of their heightened learning via hot and sweaty engagement with complex scientific principles in the interactive play spaces’ (Weier & Piscitelli 2003, p.22). This physical exertion appeared to be linked to heightened learning, through flow-like experiences (Csikszentmihalyi 1991), which were seen to be effective because the learning was emotional and physical as well as intellectual (Piscitelli et al. 2003, p.14). A later project found that children often started out with low expectations of the social and physical potential of museums, and that taking part in hands-on activities in a museum positively changed their perceptions of the sort of experiences they would have in museums (Everett & Piscitelli 2006).

Given their focus on learning, these studies have been in part interested in children’s memory-formation around museums, for example the aspects of museums that form the most salient recollections, or that the children later describe as having been most enjoyable (Anderson et al. 2002). As is generally accepted within models of

museum learning (e.g. Falk & Dierking 2000), the researchers confirm that '[c]hildren's prior knowledge and experiences influence their levels of interest and motivation during museum visits' (Piscitelli et al. 2003, p.15). The researchers found that children's salient recollections overwhelmingly focused on large objects (see also Piscitelli & Anderson 2001, p.276), but that interactive exhibits were featured less than might be expected, and conjecture that this was because children were not able to link the interactive science exhibits with their own personal experiences outside of the museum. As well as revealing children's preferences for types of museum object, this research has also highlighted young children's preferences for types of museum, finding that they preferred natural history and social history to art and science (Piscitelli & Anderson 2001; Anderson et al. 2002). Again, they conjecture that this is because:

[N]either the art gallery nor the interactive science and technology centre exhibitions provided context or links which connect with children's everyday life experience. However, the exhibits and displays of the natural and social history museum, intentionally or otherwise, had many links to children's past experiences. (Piscitelli & Anderson 2001, p.279)

While Crowley and Callanan (1998) have criticised the child-centred approach to museum learning, arguing that it moves focus away from the importance of social learning in these settings, the QUTMC approach does acknowledge the presence and importance of others in children's museum learning (Piscitelli & Weier 2002), but the focus is more squarely on the child as the learner (Piscitelli et al. 1998; Piscitelli et al. 2003), with the social setting being just an element of children's museum experience, and not necessarily one which is always straightforwardly helpful to the children's learning. Anderson et al. (2008) used in-depth naturalistic observations to show the ways in which the children's agendas competed with those of the museum educators. They suggest that children's and educator's agendas can conflict in three main ways: in terms of the content of the conversation, the mission of the child, and the amount of time that the child wants to spend in certain areas of the museum. By focusing particularly on the children, the project therefore showed that other people, whilst being an essential factor in children's learning, can also undermine or conflict with children's engagement with the museum. Like the work carried out in Greece and the UK by

Synodi (2014), the project reveals the power imbalances between museum educators and children, and the ways that this can impact upon the children's learning.

While much of this research stems from Australia, a comparable methodology has been adopted by researchers in New Zealand (Carr et al. 2012; Clarkin-Phillips et al. 2013). They worked with small groups of kindergarten children, who visited the Te Papa Museum on several occasions, exploring the ways in which children constructed knowledge and theories of the world during their interactions with the museum (Clarkin-Phillips et al. 2013, p.408). In a similar vein to the QUTMC project, research methods involved recording the children's conversation during the visit, collecting and interpreting children's artworks, and interviewing teachers. Again, as is to be expected from a study carried out over some months and using multiple methods, findings were broad, and related to many aspects of the children's museum visit, including their exploratory behaviour at the start of a visit. The researchers found that over the course of several visits, children were able to: 'construct knowledge about the purposes and protocols of a museum', including 'complex art appreciation strategies, storying, looking attentively, theorising, making connections with prior knowledge, aesthetic commentary and multi-modal re-contextualising' in the form of their own artworks (Clarkin-Phillips et al. 2013, p.418). An earlier paper about this project highlighted ways in which teachers could help children to negotiate the conceptual crossing between kindergarten and the museum. Building on Star and Griesemer's (1989) concept of 'boundary objects', the researchers and teachers found that objects such as photographs, books and children's art could be carried between kindergarten and the museum to help children draw connections across the boundary of these two learning contexts (Carr et al. 2012). Again, this can be seen as an experiential, child-focused, learning-focused project that aims to demonstrate exemplary practice between schools and museums.

#### *2.2.4 Summary of 'learning' perspectives*

There are significant differences between the three approaches described above. Their concerns can be summarised thus:

- The research from the USA is heavily socio-cultural, with a focus on family learning. It is based upon the premise that it is the responsibility of adults

(parents) to support and scaffold their children's learning in the museum. The majority of the research is carried out in science and natural history museums, with some also coming from children's and art museums. While the research includes young children, many of the projects focus on a wider age span.

- There is somewhat less academic research from Britain and Europe, with professional interest in this age group manifesting itself in grey literature such as reports and evaluations. Working with both schools and families, both the academic research and the grey literature tend to focus on the ways in which museums can support aspects of children's learning and development as defined by external curricula, policies or educational approaches.
- The research literature from Australia and New Zealand is dominated by the QUTMC project, and takes a significantly different approach to the British and American research. Long-term projects created exemplary museum programmes, often across multiple museum sites, specifically for young school children, and then used multiple methods to both observe the children and gain their own perspectives.

In spite of the differences between the research approaches described above, there are certain common findings and themes. The findings back up broader knowledge of young children's thinking and learning: that learning is multi-sensory; social, emotional and intellectual; relies on linguistic and social interaction between children and adults; and that children interpret the world according to their own theories (Alexander 2009, p.12).

But it is also significant that all of this research frames children's museum experiences in terms of learning. This is exemplified by the language used to describe young children in a 2012 edition of the US-based *Journal of Museum Education*. In the editorial, Sharon Shaffer discusses the 'need to assess the current state of affairs related to early learning,' asks 'what is really happening in [...] museums when it comes to early learners?' and says of the journal contributors that each 'shares a story about early learning in museums' (Shaffer 2012, pp.11–14). Here, children are seen specifically as actual or potential learners, and the role of museum staff is to ensure that they learn as effectively as possible within the museum. The implicit question behind much museum

literature about young children is thus, ‘what have children *gained* from visiting the museum?’ with the gains in question being framed in terms of educational value. This educational research, when taken together, assumes that the most important outcome for children visiting a museum (and therefore the most significant outcome for people studying them) is that they should learn something. In the next section I will discuss the research which focuses on other aspects of children’s relationships with museums, beyond this concern with education.

### ***2.3 Beyond learning: What are museums like for children?***

As well as focusing particularly on educational questions, some researchers have begun, particularly since the 2000s, to ask questions about young children’s *experiences* and *perspectives* in relation to museums. Within this literature review this research is being treated separately from that with a more heavily educational focus, although in reality the literature forms a continuum, in which many authors who are interested in learning do include the children’s perspectives (for example the QUTMC project), and many authors who are interested in the children’s perspectives are also concerned to some extent with learning. However, for the purposes of this review it useful to separate out the two approaches into those in which the *ultimate* goal of the research is to understand and improve children’s educational outcomes, and those in which the goal is to discover more about the children’s perspectives on museums.

This section divides the research into three areas: consultations with children, looking at children’s perspectives and preferences, and exploring children’s experiences. Again, the division of research into these three areas is somewhat artificial, but serves to show the different aims and agendas of the researchers, as well as to usefully divide the types of findings that arise from these varied approaches.

#### ***2.3.1 Consulting children: finding their perspectives***

Outside of the academic research field some museums have begun to find ways of taking into account the views of their younger visitors when making decisions about museum programming and exhibition design, with the aim of improving their services for this age group. As Langsted has argued, children should be seen as ‘experts when it comes to their own lives’ (1994, p.29) who can give information to museum

professionals about how to better tailor museums and their programming to the children's needs and interests. This concern to include children's perspectives is part of a drive to make consultations with children more 'participatory,' so that the research is seen as being carried out *with* the children rather than *on* the children (Fidler et al. 2011, p.6), thus challenging the power imbalance between children and the adults who make decisions on their behalf (Synodi 2014). Lansdown argues that varying degrees of participatory practice can be recognised (2005, pp.14–15), ranging from consultation, in which children's views are collected and taken into account, through to participation, in which children have the status of partners in the research, and finally child-initiated processes, in which the children are empowered to take action. All of the consultations with young children in museums appear to fall into the first two of these categories.

While a number of museums have worked to consult with young children, the results of these consultations often go largely unpublished, making it difficult to find out exactly how many museums are working directly with this age group. An example is the internal consultation carried out by National Museums Liverpool in 2008, which was part of the planning process for a children's gallery at the new Museum of Liverpool. Young children were given disposable cameras, and asked to photograph things that they liked around the Merseyside Maritime Museum. Analysis was not deep, but four themes emerged from the children's pictures: 'big, shiny, transport and animals'.<sup>3</sup> These interests were taken into account within the design of the 'Little Liverpool' gallery, which has animals and transport as two of its main themes. Children's consultants Playtrain have also carried out more in-depth consultations with children in museums, drawing on Reggio Emilia techniques to find ways of feeding young children's responses back to museums (e.g. Tomlinson 2007).

Within Britain, Manchester Museum have led the way in more deeply participatory consultations to explore how they can expand their programming offer for young children. MacRae (2007) describes a piece of research in which artists led workshops with young children and their families to trial new ways of working with the children in the museum. This research can be seen as moving from being consultative to becoming more participatory when, during an activity on touch, children re-claimed the workshop, rejecting a didactic, vocabulary-based activity for one in which they could focus more entirely on touching objects on their own terms (MacRae 2007, p.165).

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<sup>3</sup> Personal communication with Julia Bryan, Senior Learning Officer, National Museums Liverpool, 27th October 2009.

MacRae also notes the children's intelligent engagement with issues of touch in museums, and their curiosity as to what things could or couldn't be touched (ibid.). She concludes that '[i]n the context of working with young children, the importance of handling and passing objects and artefacts from person to person should be given attention as seriously as the passing back and forth of words.' (ibid., p.170). Within this consultation, the children were given the freedom to influence the direction taken by the artists, and in the process forced a move away from an obvious learning agenda towards a more sensory engagement with museum objects.

Fidler et al. (2011, p.4) carried out further work at Manchester Museum with families with young children, who were treated during the project as co-researchers, thus making the research fully participative, although with parents included as well as children. Methods included children photographing and drawing the gallery, families putting comments on sticky notes around the gallery, and parents being interviewed. Although the research was ostensibly about learning within the whole family, both the parents and researchers ended up focusing particularly on the children's personal engagements with the museum. For example, in a journal-based activity, parents very much assumed this to be for the children, so that 'the children gained primary ownership of the journals' (ibid., 36). This meant that, through responding to the participants the focus of the research shifted from family learning to the children's interests within the museum. Findings were broad, including children's responses to the space (for example their feelings about the darkness of certain areas and their difficulties of seeing things on high-up shelves), their interest in touch and colour, and, surprisingly for the researchers, 'no evidence [of] creative/purposeful play [or] storytelling' (ibid., 46).

There are also examples of this more participatory type of consultation from Australia, carried out by Lynda Kelly, Sue Dockett and others. Kelly et al. (2006) consulted with children aged five years and under about redevelopments at the Australian Museum, a natural history museum in Sydney, and Dockett et al. (2011) with children aged six and under in the children's gallery of the Australian Museum in Sydney. The methodologies of these consultations draw on childhood studies (James & Prout 1997) and the Mosaic Approach (Clark & Moss 2001), which advocate 'active listening — hearing, interpreting and co-constructing meanings with children in approaches that are not limited to the spoken word' (Kelly et al. 2006, p.2). Reflecting the Mosaic approach, methods included observation, interviews with children and

parents, structured storytelling and puppet-based activities, and creative, multi-sensory activities including children's photography, drawing, tours and map-making, video recording and family journals (Kelly et al. 2006, pp.3–4; Dockett et al. 2011, pp.18–19).

The Australian consultations revealed both children's interests within the museums, and their preferences for certain research methods. The researchers found that the children's responses to the museums were not necessarily the same as those of their parents, and were also very individual to the children, so that 'while some children were very eager to engage in learning specific information, others constructed narratives that related to imagination and pretence' (Kelly et al. 2006, p.8). Children's engagement with the museums was characterised by imagination, an interest in real objects, humour, physicality, connection to their lives, and the influence of family members (Dockett et al. 2011). The young participants engaged enthusiastically with many of the activities available to them during the consultation, but showed a distinct preference for photography (ibid.).

### *2.3.2 Children's preferences and viewpoints*

While many researchers have found ways to successfully consult with young children about specific museums, taking on board their viewpoints and even allowing them to feed into decision-making, others have enquired into children's preferences and viewpoints without necessarily feeding this in to museum developments. Danko-McGhee (2006) used a simple technique to investigate the art preferences of two to six year old children in an art gallery in the USA. She followed children as they explored an art gallery, waited to see which pieces held their attention for at least a minute, and then asked them if and why they liked each piece. Her findings were similar to those of Savva and Trimis (2005): she found that children preferred three dimensional artworks, representations of animals, bright colours and shiny surfaces, and the opportunity for, or suggestions of, playful interactions. She suggests that, for young children, 'play is a natural part of the art-viewing experience' (Danko-McGhee 2006, p.231).

Researchers have also explored children's attitudes towards museums in general. Kindler and Darras (1997) used interviews to show that while French and Canadian children showed a reasonable understanding of the role of museums to display various objects and as places where one goes to look at things, none of the children made any references to museums as places of learning. Dimitra Zapri took a broader ecological

perspective to exploring children's perspectives of museums, looking at 'the values and meanings children and their context attributed to the museum setting' (2007, p.138). Her methods involved interviewing young children in their homes, accompanying them on family visits to three museums, asking the children to video and draw the things that had most impressed them from the museums, and then further visits, with and without organised activities (ibid., pp.90-94). These methods revealed children's perceptions of what happens in museums, their preferences for certain types of museum activities, and the impact that their broader social contexts have on these viewpoints. Zapri found that children's perceptions of what happens in museums were strongly related to their parent's backgrounds, but that children's preferences for museums were not necessarily the same as those of their parents (ibid., pp.139-140). The study also showed that taking part in museum activities led to positive shifts in the attitudes of parents towards what their children could gain from museums, but that in spite of this, the museums did not feature highly in the families lives, and few of them visited the museums again following the research visits (ibid., p.142).

### *2.3.3 Children's experiences: broadening the focus*

Somewhat different from research that asks what children think or like about museums, is research that asks what *is it like* for children visiting museums? There are a number of early examples in the literature of anecdotes from museum staff relating to young children's museum experiences (e.g. Murdock 1987) or even of their own childhood experiences in museums (Feder 1989). Wurtak gives a lovely example of a four-year-old 'wanderer' in the Discovery Room of the Manitoba Museum of Man and Nature, as she winds her way amongst people and objects:

The wanderer can't resist and stops to run her fingers among the smooth stones, carefully lifting and then letting the slip through her fingers. She does this over and over again, mesmerized by the colours, the silky feel of the stones and the delicate noises as they fall. (Wurtak 1987, p.17)

This is not an academic investigation of a child's experiences, but it is a very human one, and is concerned not with whether this girl is demonstrating any 'learning

outcomes' or has any particular opinions, but with what it is like for her to interact with the stuff of the museum.

Experience-based research can have various foci, including the social experience, the physical experience, and the intellectual experience. Much of this research aims to incorporate and build on children's perspectives, but unlike the consultations uses these perspectives as a way to explore what it is to be a child in a museum. So, for example, Abigail Hackett, working in Sheffield in the UK, has used video-based ethnographic methods and video to explore very young children's experience as they visit and re-visit a museum with their families (2012a; 2012b). Hackett states that 'focusing on young children's perspectives of the museum [...] enables us to understand the walking and running of young children [...] in an embodied, emplaced and experienced world' (2012b, p.5). Her research has particularly highlighted the children's physical movement (described by one child as 'zigging and zooming') as a purposeful mode of communication and 'place making' (ibid. p.7) and claiming the space of the museum.

This experience-based research appears to be more often based in art galleries than science museums, and subsequently draws on more creative art education methods. Two pieces of research in art galleries particularly reveal aspects of children's social experiences. The first of these was carried out by Fasoli (2001; 2003) who researched four- and five-year-old school children visiting the National Gallery of Australia. Using observations, audio recordings and her own photographs of the children in the gallery, as well as the children's own drawings and creation of a museum back at school, Fasoli concentrated on 'how young children entered into and began to participate in the social practices encountered in an art gallery' (2003, p.37). Following the children's own concerns, rather than a focus on learning outcomes, she shows, for example, how chance occurrences led to this community of children becoming particularly concerned with rules, prohibitions and security in the museum (2001).

Drawing on approaches from childhood studies, Cook and Hess (2007) used children's photography to gain the children's perspectives of an art museum in Denmark. Their discussion particularly focuses on the children's use of photography, and the way that this was influenced by their prior experience and the social context. So, for example, although they note (as have many others) that children's choices of subjects for their photographs 'were likely to be associated with their known world of experience,' they also found that '[t]he inspiration for other photographs appeared to come from interesting stories told on the spot by another person, or by the wish to

socially belong and were taken because another child had already done so' (Cook & Hess 2007, p.41). They demonstrate the importance of reflecting upon children's interaction with the mode of data collection, as well as their perspectives of the setting in which they are being studied.

Also using children's photography, Rosemary Dunn (2012) worked with children aged from three to eight years in an Australian history museum, allowing the children to use digital cameras to record their tour around the museum, and then interviewed them about the photographs. She then sent the photographs home to the families in the form of journals, which the children and their parents were asked to annotate. Dunn found that children discussed museum objects in terms of visual detail, comparisons to their home life, and personal interests.

As well as asking about young children's experiences in museums, it is also possible to explore how young children impact upon other people's museum experiences. Tolmie et al. (2014) carried out ethnographic research in large historical museums in France and Greece, finding that young children had a significant and potentially negative impact on the visit for the rest of the family. This research highlights the conflicts caused by, on the one hand, young children's differing 'attention threshold', which meant that they often wanted to move at a different pace from other family members, and on the other hand, a strong motivation for the family to stay together, and in particular for the young child not to go missing (Tolmie et al. 2014, pp.1055–1056). This led to tensions within the family, in which the 'rights for directing the trajectory of the group [were] at least partially ceded to young children' (ibid., p.1056). However there was also a drive for these young children to begin to 'acquire a sense of accountability for attending to the coherence of the group', which meant that they too could have their pace disrupted by other family members.

## ***2.4 Gaps in the literature***

Over a decade ago, Piscitelli and Anderson argued that '[r]esearch into the museum experiences of young children is extremely limited and hence there is currently limited understanding and appreciation of children's perspectives of such settings' (2001, p.269). Even though they were discounting research in which the children's perspectives were absent, it is clear that the majority of research into young children in museums, whether from a learning or from an experiential perspective, has been carried

out since 2000. Of the literature reviewed here, which includes studies, evaluations, reports, reviews and opinion pieces, 19 publications are pre-2000, and 50 are post-2000 (see Appendix 2: ‘Literature on young children and museums’).

This growing field has been particularly dominated by certain studies and approaches. Most research from the USA is based in science and nature museums, is concerned with informal science learning within families, is heavily based around a sociocultural model of learning and focuses particularly on conversation analysis (Borun et al. 1996; Crowley & Callanan 1998; Shine & Acosta 2000; Callanan et al. 2002; Crowley & Jacobs 2002; Ash 2003; Ash 2004a; Ash et al. 2007; Melber 2007; Palmquist & Crowley 2007; Sanford et al. 2007; Siegel et al. 2007; Dooley & Welch 2014). Research in Britain consists largely of evaluations and consultation reports (Tomlinson 2007; Graham 2008a; Graham 2008b; Blackwell 2009; Graham 2009; Fidler et al. 2011). Also in Britain, Tunnicliffe and collaborators have included young children in their research into zoological learning, although this is within a larger spread of age groups and a range of settings that includes zoos, farms and schools (Tunnicliffe 1995; Tunnicliffe 2000; Reiss & Tunnicliffe 2011). Over half of the Antipodean research (11 of 19 publications) is linked to the QUTMC project, which takes a highly child-centric approach to researching young children’s museum learning.

As this review demonstrates, a large proportion of the literature about children in museums looks at the children through the lens of learning. Researchers’ images of childhood affect the way that they carry out research with children (Fasoli 2003, p.35), and a focus on children as learners must necessarily mean that certain aspects of the children’s experience are given less prominence in the literature. While children’s learning will continue to be important, understanding and improving their museum experiences also depends on understanding the children’s personal preferences, perspectives and experiences, and on including within the research things which are not educational outcomes.

Natural history museums are well represented within the literature (31 publications), as are families (47 publications). However, research which aims to understand the children’s experiences — what it is really like for them to visit these museums with their families — is more limited. Table 1 summarises the research which can be labelled ‘experiential’.

This sub-section of the literature in part takes the form of participatory consultations with children, which allow research questions and methods to change in

response to the children’s own concerns (Kelly et al. 2006; Dockett et al. 2011; Fidler et al. 2011). A small number of academics have also begun to make use of child-led methodologies to allow a greater openness in investigating children’s museum experiences (Fasoli 2001; Fasoli 2003; Cook & Hess 2007; MacRae 2007; Dunn 2012; Hackett 2012a; Hackett 2012b). As table 1 shows, within the UK there is a lack of child-led academic research exploring children’s experiences of visiting natural history museums with their families. It is also worth noting that many of these projects either involve ongoing contact with the same group of children, or are evaluations of museum programmes. There are few (perhaps only Dunn and Hackett come close) that manage to capture the type of everyday museum experiences that represent most young visitors and their families.

Research into children’s experiences is an important counterpoint to learning-based research. The latter uses the concerns of the museum, of educational institutions,

*Table 1. Literature on young children’s museum experiences*

<b>Authors</b>	<b>Project type</b>	<b>Participants</b>	<b>Country/ area</b>	<b>Museum type</b>	<b>Group type</b>
QUTMC publications (1997-2008)	Academic	176 children (inc. pilot), aged 4 to 6)	Australia	Art, Children's History/ culture, Nature & Science	School
Cook & Hess (2007)	Academic	12 children aged 3 to 5	Europe	Art	School
Dockett et al. (2011)	Consultation	40 children aged 0 to 6	Australia	History & Nature	Family
Dunn (2012)	Academic	24 children aged 3 to 7	Australia	History/ culture	Family
Fasoli (2001 & 2003)	Academic	7 children aged 4 to 5	Australia	Art	School
Fidler et al. (2011)	Consultation	7 families, ages not stated (~2 to 4)	UK	History/ culture	Family & school
Hackett (2012 a&b)	Academic	4 children aged 0 to 2	UK	Art, History/ culture & Nature	Family
Kelly et al. (2006)	Consultation	40 children aged 0 to 5	Australia	Children's, History/ culture & Nature	Family
MacRae (2007)	Academic	Not stated (small group)	UK	Art	Family

of policy makers and of parents as the lens through which the children are viewed and their experiences judged. However, if researchers ignore the viewpoints of children then they are missing half of the equation that could make museum learning effective, for example by missing opportunities that are only apparent from the children's perspectives, or by failing to notice the specific aspects of children's experiences that make the museums meaningful to them.

## Chapter 3. Methodology

### ***3.1 Requirements of the methodology***

The aim of this project has been to develop a research method to reveal everyday museum experiences from the perspective of young children who are linguistically competent, but not yet literate, and are therefore unable to participate in text-based research. The approach has been designed to focus on the children specifically during the time that they are in the museum, rather than continuing the research relationship for days or weeks afterwards. This means that, rather than focusing on long-term memory formation or learning, the research captures the texture, nuances and meanings of the museum experience itself. In other words, my aim was to focus on the *process* of the visit, rather than on its *outcomes*. More importantly, I wanted to allow the children's own perspectives and priorities to be instrumental in guiding the research.

This required a methodological framework that set the tone for working with this age group, allowed data collection to be led by the interests of the children, and promoted a focus on the fine grain of the children's experiences during the time that they spend in the museum. The method had to take into account the needs and limitations of the children as participants as well as the constraints of the museum as a setting. This meant that some methods that are used either with older children in museums, or with young children in settings such as schools, were expected to be unsuitable. The following section describes the theoretical basis for the methodology, the development of the research method through a pilot study, the impact that this process had on the research focus, the form taken by the final method, and an in-depth example of how this method worked in practice.

### ***3.2 Theoretical approach***

This project required a theoretical framework to guide the development of a method that collected data on children's everyday experiences in a museum. This framework needed to:

- Provide an appropriate lens through which to view the children and their concerns in a way that did not privilege adult concerns
- Focus the research on the meanings of the children's everyday experience in the museum (in other words, the significance of the children's experiences from both their and my perspectives)
- Ensure that the research methods allowed me to enter into dialogue with the children, and to do this in a way that was suited to their abilities
- Allow the research findings to guide the subsequent analysis and development of theory
- Account for my own position as researcher and my impact on the data production and analysis.

### *3.2.1 A focus on the children*

In aiming to discover the children's experiences from their own perspective, this research required a methodological approach that set aside typical adult concerns such as learning or memory-formation. In keeping with the experience-focused research described in the literature review, I chose to base this approach on the field of childhood studies (James & Prout 1997) and also pre-school education approaches such as that of Reggio Emilia (Edwards et al. 1998; Rinaldi 2005). These approaches assert that it is possible to gain access to the experiences and perspectives of children and, furthermore, that in doing so, educators and researchers will obtain rich data to deepen and extend their understandings of young children. The growth of childhood studies over the past two decades, and the subsequent concern with the viewpoints of children, can in part be linked to the United Nations Convention on the Rights of the Child, which states that children have the right to express their views within their capabilities, and that this expression should be in a form of the child's choosing (United Nations 1989, articles 12 & 13). This has led to the development of a substantial body of work that has devised ways of allowing young children to express their views and share their experiences (e.g. Clark & Moss 2001; Lancaster & Broadbent 2003b).

Children not only have the right to express themselves, but in doing so they are also able to give an 'inside view' on their experiences that can not be obtained simply by observing or even by testing them. The concept of children as 'experts when it

comes to their own lives' derives from Langsted (1994, p.29), who, twenty years ago, argued that adult experts had hitherto given advice on how best to provide services to children, but few had asked the children themselves. This is not simply a matter of ideology, but one of good research practice. Asking children directly will provide information that can not be obtained in any other way. As Livingstone puts it:

Empirically [...] not only parents but also children must be asked, for just asking parents [...] though it is certainly easier, and seen by some as more 'reliable' — is perhaps akin to surveying husbands on how their wives spend their time.  
(Livingstone 2002, p.77)

However, asking children is not necessarily a matter of gaining their direct explanations or descriptions, but rather involves finding modes of expression that are developmentally appropriate, taking into account their verbal, cognitive and physical abilities. The model that I have drawn on to frame my understanding of children's modes of expression is that of the 'Hundred Languages of Children' (Malaguzzi 1998, p.3), which is a key component of the Reggio Emilia approach. Within this concept, 'languages' are loosely and metaphorically understood to be the multiple ways in which children negotiate meanings and co-construct knowledge (Forman & Fyfe 1998, p.249). This concept of language therefore extends beyond the verbal, to also include, for example: 'graphic, plastic, musical, gestural' (Rinaldi 2005, p.67) and any other modes in which children (and adults) take in, process and voice their understandings of the world.

Reggio educators assert that, as children are able to express themselves in multiple languages, so the adults concerned should provide children with opportunities for these varied forms of expression, and take these expressions seriously. Katz suggests that 'a first lesson from the Reggio Emilia approach is that preschool children can express and communicate their ideas, understandings, imaginings, observations and feelings through visual representation much earlier than most [...] educators typically assume' (Katz 1998, p.34). In taking children's multiple 'languages' seriously, Reggio educators extend the hundred languages metaphor to talk about actively 'listening' to children in all of their languages. Rinaldi describes listening as 'a metaphor for openness to others, sensitivity to listen and be listened to, with all your senses' (2005, p.114). This openness requires the adult to set aside (as much as possible) their

expectations of children in a particular situation, and hence to ‘learn about a child’s perspective adult researchers have to get beyond their own beliefs about a situation and listen to children in different ways.’ (Cook & Hess 2007, p.31).

This broad concept of listening has been used by other childhood researchers, who argue that by listening to all of children’s ‘languages’, they can gain a richer understanding of the ways that children engage with and make sense of their world (Lancaster & Broadbent 2003a). This concept of listening to all of children’s languages acknowledges the validity of non-verbal modes of expression as ways for children to communicate, and therefore as sources of data. This practice has given rise to multi-modal qualitative research approaches such as the Mosaic approach, which uses children’s words, drawings, photographs and tours of their schools and nurseries to gain their perspectives (Clark & Moss 2001). Within my own research, the concept of the hundred languages of children allowed me to give weight to children’s photographs as a visual language by which the children give insights into how they experience the museum. However, it is worth acknowledging that, while in Reggio schools this practice of listening is promoted as a way for children and adults to enter into ongoing dialogue and progress the children’s education together, within my own research the listening was much more one-way. While I aimed to ‘listen’ to what the children are communicating both through verbal and visual languages, it was not a necessary part of the project that the children themselves should understand their photographs in this way, or that the broader dialogue should be reciprocal.

The concern with children’s right to express themselves is not simply a matter of producing richer research data, but is also an acknowledgement of power imbalances between researchers and the children being researched, and an attempt to redress this imbalance (Veale 2005, p.253). As discussed in the above literature review, one of the ways in which a redressing of the power imbalance has been attempted is through the development of participatory research methods, in which the child is involved in making decisions about the direction of the research and the analysis of the data (Hill 2005, p.66). Research methods within many of these participatory approaches with children often take creative, visual art-based forms. Within a participatory context, these creative methods are intended to ‘generate’ knowledge *with* the young participants, rather than ‘extract’ knowledge *from* them (ibid.), and therefore to move away from a model in which children are positioned passively within the research.

While it could be argued that all research with children should aim to become more participatory, according to Hill (*ibid.*, pp.66–67) this is something that very few studies achieve to the fullest extent. In terms of my own research, while I draw on the view of children as active, rather than passive participants, and have tested some of the creative research methods, I suggest that a high level of participation is neither necessary nor appropriate. While greater participation might be ideal in long-term action research projects that allow children to influence practical outcomes that affect them, in the case of this particular project, the children’s engagement with the research was fleeting, representative of typical museum visits, and there were no ongoing outcomes for them as a result of having taken part. Hence, while the intention was to be led by the interests and behaviour of the children, there did not appear to be great benefits to the children in having a high level of participation, and it would, conceivably, complicate the museum visit for them and their families, therefore reducing it’s ‘everyday’ nature.

This research project involves a highly imbalanced relationship between myself as researcher and the children as participants, in which I had much greater control and power, and also a much greater stake in the outcomes of the research. While I have aimed to listen carefully to what children are saying, and to make research decisions based on this information, this has been done without the children themselves needing to be aware of the ways in which they are influencing the research. Therefore, while other participatory research uses creative methods that echo the Reggio concern of allowing children to express themselves through multiple languages, my own research approach should perhaps be described as ‘creative’ or ‘active’, rather than ‘participatory’. It therefore belongs to a sub-field of childhood studies in which children are involved in ‘reporting on, or in some way revealing or displaying, their experience’ (Greene & Hill 2005, p.12) rather than one in which they are taking a lead.

### *3.2.2 Rich data*

While childhood studies is concerned with children’s broad experience, it is apparent from the above literature review that within the field of museum studies even experiential research with young children is often carried out by educational researchers and hence framed in terms of learning and pedagogy (e.g. Piscitelli & Anderson 2000; MacRae 2007; Carr et al. 2012; Synodi 2014). This project, however, attempts to have a

less instrumental and learning-based focus than much of the work with young children in museums (Johanson & Glow 2012, p.29), and instead to focus on the fine grain of children's own experiences as museum visitors. My concern with data that can reveal the 'ongoing flow and complexities' of daily life (Greene & Hill 2005, p.15) has led me to draw on ethnographic approaches as a way of tempering the influence of the educationally-focused research. A deeply qualitative ethnographic approach encourages the researcher to '[pay] more attention to the original *voices* of the actors in everyday life [and] make room for a broader view of the social reality' (Schatz 1993, p.1).

Although there is some precedent for using ethnographic methods to research families in museums (Ellenbogen 2002; Tolmie et al. 2014), my methods are very different from those used by most ethnographers. In particular, I did not dwell in the 'field site' of the museum for extended periods of time, and spent only around 20 minutes with each participant, rather than the months or years that are more usual within ethnography. What my research does have in common with an ethnographic approach, however, is the intellectual effort which anthropologist Clifford Geertz refers to as 'thick description' (1973, p.6), by which he means the elucidation of the meaning of people's actions within a rich and broad cultural context, rather than narrow descriptions of particular aspects of these actions. This effort requires that we gain people's perspectives, and enter into the imaginative universes within which their actions take place (ibid., p.13).

To this extent, an ethnographic perspective sits comfortably with the approaches upon which I have drawn for my view of children and their potential for expression. The ethnographic concerns with dialogue and conversation resonate strongly with the Reggio focus on language and listening, while the concern with finding meanings in people's actions closely resembles the focus on 'lived experience' rather than educational outcomes, which is a key component of the Mosaic approach (Clark & Moss 2011, p.7). What ethnography adds to the methodological framework is a concern with broad and rich data, and an openness that is encouraged by the fact that studies begin with questions rather than hypotheses (Ellenbogen 2002, p.85).

### *3.2.3 Being led by the data*

Although my use of observations, interviews and visual methods is to some extent congruent with ethnographic methods as they are used within childhood studies (Greene

& Hill 2005, p.15), in the early stages of the research I sought a framework to provide more practical guidance. In particular I required an approach that would lead the project from a broad to an increasingly narrow and deep focus, that would allow me to respond with flexibility to the participants, and that would also provide a degree of structure to guide the process of analysis. For this I have drawn on Grounded Theory (Glaser & Strauss 1968; Charmaz 2006). This is not in itself a theory, but is rather a set of 'systematic, yet flexible guidelines for collecting and analyzing qualitative data to construct theories "grounded" in the data themselves' (Charmaz 2006, p.2). While the original formulation of Grounded Theory research was heavily directive in the structure of the research procedure (Glaser & Strauss 1968; Glaser 1992), there is a strong precedent within qualitative educational, museum and childhood research for using elements of this approach without following the entire process (King 1984; Mercer 1991; Dockett et al. 2011; Pattison & Dierking 2013).

For the purposes of my own research, I particularly drew on the Grounded Theory practices of:

Simultaneous involvement in data collection and analysis; Constructing analytic codes and categories from data, not from preconceived logically deduced categories [...]; Advancing theory development during each step of data collection and analysis [...]; Sampling aimed toward theory construction, not for population representativeness. (Charmaz 2006, p.5)

This approach was most valuable during the initial stages of the research process, as Grounded Theory stipulates that from the beginning of a research project the analysis should be carried out simultaneously with data collection in an ongoing process that allows the data collection to become increasingly deep and focused in response to findings (ibid.). This meant, in essence, that the project began with a pilot study that had the freedom not only to test the data collection methods, but to generate the research questions as well (Mason 2002, p.46), and that the boundary between the pilot study and the actual study was much more flexible than might otherwise have been the case. In this way, the focus of the project was led by the responses of the children themselves, rather than by my own priorities regarding their museum experiences.

### 3.2.4 Interpreting the data

While elements of Grounded Theory have been useful in the structuring and planning of the data collection, there are elements of this method that are at odds with my own — in particular Grounded Theory's attempt to make qualitative research scientifically objective, and the impact that this has on the position of the researcher. Grounded Theory was originally developed as a way to avoid theory being 'forced' by individual researchers' expectations of a fit with an existing theoretical framework, but instead to allow theory to *emerge* from the data (Glaser & Strauss 1968, p.34; Glaser 1992, p.2). One of the defining components of the approach was 'conducting the literature review *after* developing an independent analysis' (Charmaz 2006, p.6), so that researchers would not be influenced by existing theories and would therefore be more objective in their analyses.

There are a number of problems with this approach, the first of which is that it does not acknowledge the role of researchers in the creation and analysis of their data. Silverman criticises this positivist approach as being 'simplistic inductivism', in assuming that a particular research process will allow an objective meaning to simply emerge from data (Silverman 2010, p.84). More specifically, Chalmers argues that such a naïve version of inductivism, in which the researcher is not influenced by existing theory, provides no way for the researcher to know which observations should be collected. He states that:

The variations that are significant are distinguished from those that are superfluous by appealing to our *theoretical knowledge of the situation* [...] But to admit this is to admit that theory plays a vital role *prior* to observation. (Chalmers 1982, p.16)

As someone with many years experience of working with children in museums, who has, over the years, studied many aspects of museum and science learning, it must be the case that my own prior experience and existing knowledge will influence my choice of research question, and the ways that I approach the data collection and analysis. It is therefore at this point that I turn from Grounded Theory and return to the ethnographic approach, in which it is acknowledged, as Geertz states, that:

Although one starts any effort at thick description, beyond the obvious and superficial, from a state of general bewilderment as to what the devil is going on — trying to find one's feet — one does not start (or ought not) intellectually empty-handed. (Geertz 1973, p.27)

What this means is that, rather than theory emerging from the data with the help of the objective 'machine' that is Grounded Theory, instead, the outcomes of research are the researcher's inscriptions and interpretations of otherwise fleeting acts in which, 'what we call our data are really our own constructions of what they [i.e. the research subjects] [...] are up to' (ibid., p.9). I am not a child, and can not therefore provide the actual perspective of a child, but I can provide my own interpretation of a child's perspective.

This resonates with the Reggio approach, in which Dahlberg and Moss refer to such a standpoint as 'rigorous subjectivity', and state that 'there is no objective point of view that makes observation neutral,' but that by accepting subjectivity 'the subject [takes] responsibility for her or his point of view' (Dahlberg & Moss 2005, p.16). It is this responsibility towards my research, to the young participants, and to the ways in which I use the data that is key to the development of the methodological approach. From childhood studies and Reggio Emilia I have therefore taken a responsiveness to the participating children, and an openness to their experiences and perspectives. From Grounded Theory I have taken a system that allowed me to respond both methodically and flexibly to the data as I collected them. And from ethnography I have taken a focus on rich data, as expressed through the voices of the participants, which I interpret and present within this thesis.

### ***3.3 Constraints of participants and setting***

Having presented the theoretical framework, the following section discusses the specific constraints of working with both young children and in museums, the more practical questions which the methodology also needed to address.

#### *3.3.1 Working with young children*

While researchers within the field of childhood studies maintain the political perspective that young children are as capable of being involved in research as adults,

there are a number of practical issues that must be taken into account to work successfully with this age group. My research takes for granted that the participating children are not literate enough to take part in writing-based methods such as questionnaires. However, there are further potential problems that may arise, both from the abilities of the children, and from the social ways in which children and adults tend to interact, which can affect the usefulness of the data they produce together.

While the field of childhood studies demands that researchers find ways to gain children's direct accounts of their experiences, some researchers have questioned whether young children are capable of being effectively interviewed at all. This is not so much due to limitations in their linguistic skills, as an issue of their more limited ability to accurately remember and recount even quite recent past events (Siegler & Alibali 2005, p.228). In particular, it is suggested that young children find it hard to reflect back upon their own personal experiences. In his work in British infant schools, Ronald King made a conscious choice to neglect children's own 'meanings', believing that direct observation would reveal the child's inner state more usefully than interviews:

There are considerable methodological problems in investigating the social (that is, shared) subjectivities of small children [...] Whatever their competencies in relation to other children and to adults [...] they seem to lack those for being interviewed. It could be that they have not become sufficiently reflexive about their experience to recount their motives. (King 1984, p.126)

Likewise, Piscitelli and Anderson state that museum research with young children needs to take account of 'their limited ability to communicate, difficulty in self-reflecting on their past experiences, and reliability issues associated with data collection by unfamiliar adult investigators' (2001, p.271).

There is also evidence from the field of developmental psychology of children's reduced ability to recall past experiences. Loftus et al. (1992, p.95) found that, in tasks involving episodic memory (i.e. memories of events), young children were less accurate, and less complete, with fewer details than adults, unless the details were of particular interest to them. This may be because of young children's more limited life experience, which results in them having fewer 'scripts' representing the types of events that they encounter (Farrar & Goodman 1990). This means that they are less likely to

effectively remember the ‘gist’ of an event, but it also makes it harder for them to remember the details of what happened during novel experiences. While my research does not focus on the memories that children *took* from the museum, it was still vital that they were able to remember aspects of their visit at the time of the interview.

However, not only do young children appear to find it difficult to remember past events, but there are also potential problems in getting them to report their memories accurately. Young children have been found to be more susceptible to leading questions, and therefore more suggestible than adults (Loftus et al. 1992, p.95; Siegler & Alibali 2005, p.229). As well as suggestibility (in which the child may believe themselves to be remembering something that they are not), there is the issue of children responding affirmatively to the researchers because they are used to being expected to agree with adults (King 1984, p.126). The wording of the questions can also make interviews difficult for children, particularly where questions are complex or abstract (Hatch 1990, p.261). All of this means that when interviewing children, it is particularly important to find ways of phrasing questions in such a way that children can make sense of them, and are not led to particular answers.

Researchers within the field of childhood studies have argued that successfully carrying out research with children does not necessarily involve finding completely novel methods, but rather identifying methods which ‘resonate with children’s own concerns and routines’ (Christensen & James 2000, p.7). Critchley states this more simply — that methods need to make ‘human sense’ to the child participants (2003, p.57). Methods need to be designed to take into account children’s previous experience of the activities being used, of their skills, and of their needs.

In school and nursery settings where consultation methods such as the Mosaic approach (Clark & Moss 2001) have been used, children become accustomed to being consulted, and so begin to learn how to respond to the researcher and their demands. Essentially, they are trained in becoming more skilled research participants. However, in museums, the children visiting can not be depended on to have been previously asked about their opinions in these ways. For research methods to make ‘human sense’ to the children, it is therefore vital that they not only make use of children’s existing *skills*, but that they also make *intuitive sense* to the young participants.

There are further logistical problems with working with young children, as they can not be recruited directly, but must be accessed via gatekeepers, defined as ‘someone who is able to grant or refuse access’ to the prospective participant (Silverman 2010,

p.434). In the case of research with children, the gatekeepers are parents and teachers, who need to be persuaded to allow the children to participate, and who often need to support the child in their taking part. Pollard stresses the importance of building a relationship with teachers (1996, p.292), and this is much more challenging when the teachers are reached through the additional gatekeeper of museum staff. This issue of gatekeepers had a very direct influence on the direction taken in this research, which will be discussed further in section 4.6.1, about the findings from the pilot study.

Finally, even where parents and teachers agree to the research, the children must decide whether or not to participate. Where research occurs in schools, young children can initially be quite reticent to speak to researchers, but become accustomed to the idea with time (Critchley 2003, p.57; Piscitelli et al. 1998, p.78). In cases such as my own, where the researcher meets the child on the day of the research and asks them to participate immediately, young children's reticence has the potential to be a significant barrier to the success of the project.

### *3.3.2 Working in museums*

Because the research methods were partly drawn from educational approaches (Mosaic and Reggio Emilia), they needed to be adapted to take account of the limitations of working within a museum, as opposed to a school or nursery. A further limitation was that, while some museum research with children continues at school or home after the museum visit (e.g. Piscitelli & Anderson 2001; Golding 2005; Dunn 2012), this project was intended to capture everyday museum experiences during the actual time of the visit, and was therefore planned to take place entirely in the museum itself during the time of the visit. This meant that the chosen research methods had to take account of the physical and social constraints of the museum. Table 2 below outlines some differences between museums and schools, from the perspective of carrying out this type of research.

As table 2 shows, there are significant differences between the educational settings in which methods such as the Mosaic approach have been developed, and museums. However, there are also significant differences between school groups and family groups within museums. In addition, museums themselves are highly idiosyncratic spaces, and an approach that has been used successfully in one museum may not be directly transferrable to another. Although, as the Literature Review

*Table 2. Differences between working with museums and schools*

	<b>Museums</b>	<b>Schools</b>
Public/private nature of the space	Open to the public —no control over who is sharing the research space.	Closed to the public — there is control over who is sharing the research space.
Familiarity of the space to the participants	Not an everyday space — may be totally unfamiliar.	An everyday, familiar space.
Physical nature of the space	Large, complex space — layout of exhibitions, lines of sight for observations etc.	Multiple enclosed spaces of classrooms — observations are more straightforward.
Participant behaviour	School groups generally stay together and may be directed around the museum. Family visitors choose where to go, for how long, and may not stay together as a group.	Children’s movements and behaviour are highly directed throughout the day.
Noise levels	Noisy public space — challenging for interviews & observations, although private or quiet spaces may be available for interviews.	Classrooms may be noisy, but quieter spaces are available.
The museum/school year	Very busy at some times (school & public holidays & weekends), and very quiet at others. Attendance of particular groups (schools/families) varies greatly throughout the year, and is unpredictable.	Attendance is mandatory, and therefore is highly regular and predictable throughout the year.
Participants’ time available for research	Short visit lengths, with a high degree of focus on the setting, and potentially few ‘fallow’ periods available for research. Research methods need to be unobtrusive within participants’ visits.	Busy school day, but children spend large amounts of time in school, so research will take up a smaller proportion of their time
Recruitment/gatekeepers	Different gatekeepers, depending on the group being worked with. Working with school groups requires communication & cooperation in advance from multiple gatekeepers. Working with families with single gatekeepers can occur on the day of the visit or in advance.	Researcher needs permission from teachers and parents. Communication is relatively straightforward.

(chapter two) demonstrates, there are a number of standard methods used within visitor studies (observations, video and audio recording, questionnaires, interviews, journalling, photography etc.) within each study the method will have been adapted to the specific limitations of the case-study museum. Methods need to take into account the range of ways in which various groups interact with the museum space in terms of movement, group coherence and time, and the degree to which groups are willing to have their visit interrupted by participating in research.

### **3.4 Possible Methods**

The following section reviews methods that had potential to be used in this research. Methods are discussed in terms of their suitability to be used with young children, to be used in museums, and for their potential to provide a focus on the fine grain of experience from the child's perspective.

#### *3.4.1 Multiple methods*

As stated above, this research aims to understand children's museum experiences from their own perspectives, and to give the children a voice within the research. As such, it draws very directly from the childhood research methods that have similar aims, in particular from the Mosaic approach, which emphasises 'the importance of exploring children's views and experiences of *everyday life* in the institutions they attend' (Clark & Moss 2001, p.8). Although the typical experience of being in a museum is very different from that of school, there appeared to be enough of a precedent within museum education research to use the types of mixed methods that comprise the Mosaic approach (e.g. Kelly et al. 2006; Marcus et al. 2009; Dockett et al. 2011; Fidler et al. 2011).

For Clark & Moss, the essential ingredients to the success of the Mosaic approach are:

[F]irstly the methods: the combined use of tools which enable young children to express their ideas and feelings with confidence. Secondly, it is the attitude towards children which this approach represents: children as experts in their own lives. Thirdly, there is a value in each piece of the mosaic. However, the value is

increased by *combining* with other pieces... (Clark & Moss 2001, p.54, my emphasis)

The Mosaic approach was developed to consult with pre-school children in their educational settings. Children are observed, interviewed, give tours, create artworks, take photographs and make maps as a way of generating data about their experiences in their school or nursery. The aim is to find ways to give young children a voice, and this draws in part on the Reggio concept of children's 'hundred languages', and the Reggio practice of documentation, in which teachers collect children's work, and then use this in reflective discussions with the children (Clark & Moss 2001, p.5). The approach is referred to as a 'mosaic' because, for each individual child, the collection of different types of data provides a 'mosaic' of their experience, in which each of the multiple methods supports, enhances or challenges data from the other methods.

A number of museum researchers have drawn directly on this approach, including Lynda Kelly and Sue Dockett in Australia (Kelly et al. 2006; Dockett et al. 2011) and Yvette Fidler and Rosie Marcus in the UK (Marcus et al. 2009; Fidler et al. 2011). Kelly, Dockett and their co-researchers recruited families for a day of consultation, and as well as observing the children in the gallery, provided a variety of activities, including drawing, photography and tours, that the children could choose from to take part in the consultation. Many others have used similar multiple-methods approaches with the aim of give children's voices greater prominence in their research (e.g. Anderson et al. 2002; Fasoli 2003; Dunn 2012; Clarkin-Phillips et al. 2013). In all of these approaches, multiple methods are used to provide a rich description of the child's meaning-making process, and to allow the researcher to listen to the children's voices in a whole range of languages.

Drawing on this growing methodological approach, I initially planned to use multiple creative interview methods with the children, including combining interviews with drawing, tours and photography. I was, however, aware that a somewhat different approach would be required in creating a 'mosaic', as the children and their families would only be participating during the short duration of their visit to the museum, and would not be contacted for follow-up research. Because the children would be in the museum for such a short amount of time, it would not be possible to ask each child to carry out more than one method. Instead, I anticipated creating a 'mosaic' for the museum setting itself, made up from the combined experiences of many children using

several creative interview techniques, as well as observations of other visitors in the museum.

### 3.4.2 Interviews

While interviews are a common feature of museum visitor studies, these methods need to be somewhat adapted to ensure that they make ‘human sense’ to young children (Critchley 2003, p.57) and making the best possible use of their competencies (Punch 2002). Taking account of the needs of young children within an educational research context, the Mosaic approach combines the more active and creative activities with verbal speech, with these activities prompting speech whilst also providing the children’s perspectives in another language:

We have chosen a framework for listening which is an integrated approach, combining the “visual” with the “verbal”. The value of *talking* to young children about their daily lives is not overlooked. However, tools are suggested which also enable young children to communicate their ideas and feelings to adults in other symbolic ways, for example through photographs or drawing. These methods may in turn serve as a springboard for more talking, listening and reflecting. (Clark & Moss 2001, p.6)

When used within interviews with young children, these ‘creative’<sup>4</sup> methods have a number of advantages. As well as providing children with an additional ‘language’ with which to express themselves (Piazza 2007), and being triggers or prompts (Greene & Hill 2005, p.15), they can also provide some familiarity to help the children to cope with the experience of being interviewed. Samantha Punch suggests that,

since children tend to lack experience of communicating directly with unfamiliar adults in a one-to-one situation, a more innovative approach such as using task-based methods can enable children to feel more comfortable with an adult researcher (Punch 2002, p.330).

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<sup>4</sup> I will use the terms ‘creative’ or ‘active’ methods as a shorthand to refer to methods that allow the children to express themselves in non-verbal ways in the interview. In the case of my own research, these are children’s drawings, tours and photographs.

While the main focus of the Mosaic approach is to listen to children, researchers have also been keen to find ways to value and include the ‘unique perspectives’ of parents and practitioners (Clark & Moss 2001, p.32). This is relatively straightforward in a school setting, where individual adults can take time away from being with the children to be interviewed. In a museum it is harder to work with either adults or children independently, as family or school groups may only have one or two adults with them, and will have very limited time for allowing multiple interviews with one group.

I selected drawing, tours and photography as the additional elements within the children’s interviews, and discuss these decisions further below. I refer to these methods as drawing-elicitation, tour-elicitation and photo-elicitation.

### *3.4.3 Drawing-elicitation*

Drawing has been widely used within both museum education research and early years research, and is a popular method for exploring the understandings of children of all ages (e.g. Moussouri 1997; Hooper-Greenhill et al. 2007; Nicol & Horndecker 2012). Its popularity in research with younger children is unsurprising, as it is an expressive skill that children gain before they are able to write (Tunncliffe 2011, p.66), as well as being technologically simple and cheap. Even very young children’s drawings are able to represent both their position in the world (their physical perspective) and their interest that arises from this position (Bezemer et al. 2012, p.6). Because drawings encourage children to express their predominant interests, they can be used as prompts for interviews to ensure that they are guided by the children (Nicol & Horndecker 2012). They can also be used as an additional form of data to be analysed independently (Moussouri 1997), or to supplement a broader range of data types (Fasoli 2003).

Much of the research that uses drawing extends to after the museum visit. This is either done to allow parents and children the time to reflect back on their visit (e.g. Dockett et al. 2011) or to test the children’s dominant memories of the museum (Piscitelli & Anderson 2001; Hooper-Greenhill et al. 2004). Drawings also have the potential to be used as pedagogical tools, for example to help the children to connect their museum and school learning, but with the additional advantage of being available as data for reflection and research (Carr et al. 2012). It was not, however, clear from the literature whether combining drawing with interviews would be a successful research

method in an approach such as mine, in which all of the research took place during the short timescale of the museum visit.

#### *3.4.4 Tour-elicitation*

Tours are used in the Mosaic approach to provide ‘a child-led way of talking which is far more alive than the sterile environment of a traditional interview room’ (Clark & Moss 2001, p.28). Children are interviewed as they lead the researcher around their educational setting, allowing them to take cues from what they see around them. Clark suggests that one of the advantages of this approach is that even shy children find it easy to talk about a place when they are actually there (2001, p.337). Outside of educational settings, tours have been used by Raittila in her ethnographic exploration of ‘the encounter between children and the urban environment’ (Raittila 2012, p.274), in which, rather than interviewing children, she accompanied them on their tours of the local area, allowing the children to choose where to go, and recording their natural conversations.

In both Clark and Moss’s and Raittila’s non-museum research, the children are very familiar with both the setting and the researchers, and also become familiar with the method. This has also tended to be the case in the few museum-based studies using young children’s tours, although the approaches are often quite different from that used in the Mosaic approach. Children were certainly well prepared to use tours in the QUTMC project, which used child-led tours as part of the year-long project with young children in museums (Piscitelli et al. 2003; Weier 2004). Weier argues that these tours were empowering to the children, who were excited at the prospect of leading adults around the museum and taking control of which areas they visited, while the adults gained valuable insights into the children’s perspectives of the museum. Dockett et al.’s (2011) mixed-method museum consultation with young children used child-led tours combined with photography or video, so that the children led their parents and the researcher around the museum, with the child also taking photographs and being audio or video recorded explaining their choices. In this case, regularly-visiting families were recruited in advance, and so were prepared to spend a significant amount of time and effort in these activities. A somewhat different approach was used by Danko-McGhee (2006) in her study of young children’s art preferences in a gallery. This involved following the children to see which artworks held their attention, and then asking them

about their choices. Again, families had been recruited in advance for this study. Therefore, as with the drawing-elicitation method, there was little precedent for using tour-elicitation with children who are only recently familiar with the museum and who are unfamiliar with the researcher.

### *3.4.5 Photo-elicitation*

With advances in digital photographic technology, photography has become increasingly popular in research with young children in museums and more broadly (see Einarsdottir 2005 for an excellent overview). Photography is seen to be advantageous because photographs have ‘value in the “adult world”’ (Clark & Moss 2001, p.24), and being able to use a camera ‘raise[s] the status of the whole experience’ (Marcus et al. 2009, p.19). There is a huge variety of possible ways in which cameras can be used in such research, including taking photographs of the children (e.g. Fasoli 2001; Fasoli 2003); asking the children to take photographs but not asking for their comments on the photographs (e.g. Julia Bryan’s unpublished consultation in Liverpool’s museums, 2009); and asking children to comment on photographs taken by the researcher (e.g. Anderson et al. 2002, p.219). This section, in keeping with the methods already discussed, concentrates on methods in which young children’s own photographs are used as a discussion point with them during interviews.

Although photography is, like drawing or tours, a way that children can express themselves through a non-verbal ‘language’ (Clark 2001, p.336), there are a number of factors that set it apart from these other methods. Research from more than a decade ago was generally limited by having to use film-based cameras (usually disposable), which took time to process. This meant that interviews with the children about their pictures often took place at least a day after the pictures were taken (e.g. Clark & Moss 2001; Sharples et al. 2003; Cappello 2005; Cook & Hess 2007; Marcus et al. 2009). Gradually, researchers have become happy to let young children take control of digital cameras (Einarsdottir 2005; Stephenson 2009; Dockett et al. 2011; Dunn 2012).

Photography potentially generates a much greater quantity of data than drawing or tours. Some researchers have limited this through the use of film cameras, or by instructing the children to take a particular number of pictures (Tomkins & Tunnicliffe 2007). Others have themselves chosen the photographs they want the children to discuss

(Cappello 2005). However, within a Mosaic-style approach, it is appropriate that the children should choose which photographs to discuss (Clark & Moss 2001).

An advantage of this greater generation of data through photographs is that it can give a broader view of children's varied interests within a museum. This method has hence been used within museum consultations, both with and without children's comments on the pictures (Bryan 2008; Marcus et al. 2009; Dockett et al. 2011). Like drawing and tours, children's photography has been used in museums as a pedagogical tool for supporting 'student-centred inquiry and curiosity', with the advantage of providing a wealth of data for research and reflection (Lemon 2013a, p.356). Within educational projects and more academic research, photography is often combined with other methods, for example Dockett et al. (2011) video recorded children as they took photographs around a museum, to provide a broader context for the images. However, a small number of researchers have begun to make use of photography-based interviews exclusively (Cook & Hess 2007; Dunn 2012). In the work by Dunn, young children on a tour of a history museum were provided with digital cameras and asked to photograph things that they 'liked or found interesting', and these pictures used as the basis for interviews, with the aim very deliberately being to gain children's perspectives of the museum through their photographs.

Even within these latter, more 'pure' photography-based studies, the research often continues beyond the day of the visit. In particular, photographs are often constructed into journals for the children to have and comment on further (Dockett et al. 2011; Dunn 2012). Therefore, like drawing-elicitation, it was not clear whether photo-elicitation would be effective in research over the short time frame of a single visit.

#### *3.4.6 Observation*

Observations are both a key element of the Mosaic Approach (Clark 2001) and a central and enduring feature of museum visitor studies (Hooper-Greenhill 2011). The general aim of observations are to reveal visitors' 'natural' behaviour within the setting.

However, the approaches to carrying out observations are highly varied, depending on the requirements of each piece of research. As this research was intended to be multi-modal, observations were to make up a relatively small aspect of the final project, and this too would affect the appropriateness of the observation method. The purpose of the observations was to: a) provide broad information about visitor behaviour in the

museums being studied, and b) to supplement and triangulate the main, interview-based data (Robson 2002). The observation technique needed to be light-touch and experiential in focus,<sup>5</sup> whilst also providing data on a large number of visitors to give a context for the interview data.

One of the major issues of carrying out observations is that knowledge of being observed can potentially affect the behaviour of the subjects (Robson 2002, p.311). However, in most settings, social and educational researchers are rightly cautious of carrying out covert observation, in which the subjects are unaware that their actions are being recorded and often prefer to risk disturbing the phenomena being observed in favour of the ethically approved stance of being open with subjects that they are being observed. Within public spaces, however, covert observation is considered ethically legitimate, as participants are implicitly aware that their behaviour is open to scrutiny (Gobo 2008, p.108). Because museums are public spaces, it is generally considered less problematic for researchers to carry out covert or unobtrusive observations, except in cases where visitor behaviour is being filmed or audio recorded (Crowley & Callanan 1998, p.16).

As well as ethical considerations, there are logistical challenges to carrying out unobtrusive observations in a public space, as it can be difficult to observe and take notes without drawing attention (Tracy 2013, p.113). Two important forms of covert observation in museums are tracking studies, in which groups of visitors are followed throughout all or part of their visit; and focused studies, in which the researcher concentrates their attention on all the visitors who make use of a particular exhibit (Bitgood 2002, p.463). For a tracking study to remain covert, the focus can really only be on visitor behaviour, as it is not possible to get close enough to hear speech without being noticed. So, for example, Speering et al. (1997) gathered information about the 'purposefulness' of children's use of interactive science exhibits and the composition of the social groups, but without listening to the children's conversations. However, without also listening to visitors' speech, it is not possible to gain an understanding of their meaning-making processes and a deeper knowledge of their personal experiences. Focused studies are better suited to listening to as well as watching visitors. So, for

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<sup>5</sup> Over the past two decades it has become increasingly popular to make use of technology, such as video and audio recording equipment, in observations of visitors. This approach tends to be used where the observation is the main source of data, and therefore the main focus of in-depth analysis. As observation takes a secondary role in this research, I will not discuss the technologically-based observation techniques.

example, Shine and Acosta (2000) covertly observed families using a role-play area of a museum, collecting both physical and verbal behaviour. To achieve this the observer positioned herself in a corner of the focus area to write notes, and if challenged, gave the somewhat evasive explanation that she was ‘studying the exhibit’ (Shine & Acosta 2000, p.46).

An alternative approach is to gain the permission of the visitors, and then carry out the observation in such a way as to disturb the visitors’ behaviour as little as possible. Such an approach is best suited to observations which focus on a small number of participants for a longer amount of time, particularly as this gives the visitors a chance to become accustomed to being watched, thus allowing their behaviour to become more naturalistic. Examples include Watson et al.’s (2002) observations of three school children during their visits to an Australian interactive science exhibition; Everett and Barrett’s (2011) research with seven female visitors, aged 5 to 80 years, to an Australian museum and art gallery; and Briseño-Garzón and Anderson’s (2012) observations of 20 families visiting a Mexican science museum. Such an approach is particularly useful when used in conjunction with more direct social methods such as interviews with the same visitors, and indeed this was the case in the latter two of the above examples.

Where research focuses specifically on the behaviour of young children, it can be possible to gain the permission of parents, without the children being fully aware that they are under scrutiny. This approach was used in Danko-McGhee’s (2006) study of the attention paid to artworks by children aged two to six years in an American art gallery, and in a consultation carried out with children aged two years and under at museums in Manchester, UK (Mair et al. 2012). However, although it is assumed that the children may be largely unaware of being observed, their behaviour may be affected by their parents’ knowledge of the research, or they may be nervous in the presence of the researcher. It is also common within museum education research to observe children taking part in programmed activities, again with the permission of parents and teachers. In these situations it is easier for the researcher to be discreet, as children within classroom-type settings are accustomed to other adults being present for various reasons. Observations of educational activities and organised tours have been carried out with both school and family groups by a number of researchers (Watson et al. 2007; Bamberger & Tal 2007; Hooper-Greenhill et al. 2007; Illeris 2009; Eckhoff 2008).

In some cases, researchers have forgone unobtrusiveness in favour of combining observations with direct discussions with participants about their museum experiences (note the change from ‘subjects’ to ‘participants’). In particular, ethnographic and action research studies involve the researcher, often in a participant-observer role, actively engaging with the children, whilst also extensively recording their observations as an important aspect of data collection (Ellenbogen 2002; Kelly et al. 2006; MacRae 2007; Soren 2009; Dockett et al. 2011; Carr et al. 2012; Munro 2013). This approach addresses the criticism of Green and Hill that,

in relation to children’s experience, the analysis and interpretation of observational records of behaviour (including speech) necessitate a level of inference beyond that which is required when the child is in some way reporting directly on his or her experience (Greene & Hill 2005, p.13).

In other words, unless researchers ask the children directly, they are having to infer their own explanations for the children’s behaviour.

These latter approaches, whilst fulfilling my requirement for an observation method to be ‘experiential’, are most certainly not ‘light-touch’, and are therefore largely unsuitable as a secondary or supporting method. In addition, many of the experientially-focused methods involved working with a small number of visitors, whilst I wanted a general picture of visitor behaviour to provide a context for the smaller number of interview-based participants. I needed my pilot study to help me develop a method of observation that focused on visitor experience, but of a large rather than a small number of visitors.

### ***3.5 Ethics***

Within this research project, the two most significant ethical issues are those of consent and anonymity. These issues are different for the two different group of subjects: firstly the children (and associated group members) who were worked with directly using creative interviews, and secondly the visitors to the museum who were observed in the galleries. I received university ethics clearance to carry out both of these research activities.

The research began and ended with observations of visitors in the galleries. As discussed in section 3.4.6, collecting data from people in public spaces raises questions of whether these people have a right to be made aware of being observed, which can, for example, be achieved by positioning a sign near the entrance of the museum. However, informing subjects that they are being observed risks changing their behaviour, with implications for the validity of the research data. Gobo (2008, p.108) suggests that research carried out in public spaces, in which the researcher does not interact with the subjects of the research, is one of the few cases in which covert research (i.e. research in which the subject is unaware of their involvement) can legitimately take place. Because the observations were recorded in the form of written notes rather than video or audio, they did not involve collecting information about the visitors that could be used to identify them.

Informed consent for more involved research participants who are being interviewed should involve a relationship between the participant and researcher which is open, carried out without deception, in which the participants understand what is required of them during the research, and from which the participant can withdraw at any time (Silverman 2010, p.155). Communication with participants is essential to this process, and must be carried out in a way that makes sense to the participants, with an awareness of any potential barriers to their understanding. This is particularly the case when working with young children, who can not be expected to understand the broader implications of taking part in research. Silverman, quoting the ESCR Research Ethics Framework, advises that researchers make every effort to obtain informed consent from vulnerable participants such as children, but that proxies, such as parents, must also be asked for consent, and should manage the consent for the participant (Silverman 2010, p.155).

When working with pre-literate children, communication with the child needs to be carried out entirely verbally, whilst communication with adults can be both verbal and written. Within this project communication with adults made use of information leaflets and consent forms, which adults were asked to sign on behalf of themselves and their child (see Appendix 4: 'Parental information form' and Appendix 5: 'Parental consent form'). The language used to explain the research verbally to the children was adapted to their linguistic capabilities, and included checks and repetition to ensure that they understood what was expected of them and were able to form a judgement as to whether they wished to participate (Hill 2005, p.63).

While parents were able to give legal ‘consent’ for their children to participate in the research, an important concept within childhood studies is that the children themselves should be able to express ‘assent’ when given the option to take part (Dockett et al. 2013, p.804). This respects that children’s choices may be different from those of their parents, but must absolutely be taken into account. In addition, Dockett et al. (2012) argue that respecting children’s expressions of *dissent* is key to carrying out ethical research with young children. Indeed, within this research, participation was often brought to an end or even prevented from happening at all by children’s expressions of dissent.

To ensure the safety of the child, all interactions between the children and myself were carried out in the public space of the museum, and wherever possible the adult responsible for the child was present. It was decided that, because all interactions were, firstly, in public, and secondly, fleeting, it was not necessary for me as researcher to have a Criminal Records Bureau check, as is sometimes required for work with children.

Once data has been collected, there are the issues of who has access to it, and in what form. Although this research project was not carried out with the aim of uncovering any highly personal accounts of people’s lives, its qualitative nature meant that such information could have arisen during the course of data collection. In addition, participants provided personal details such as names, ages and contact details. To protect the participants confidentiality, all data was stored securely in a password-protected computer, all participants are referred to by pseudonyms, and no information regarding their home towns is given (Singleton & Straits 1999, p.524). The only personal information that is given in the text is the children’s ages and genders.

Anonymity can be more challenging where photographs are part of the research. For the photographs included in this publication preference has been given to images that do not show people, or that show people from angles or distances that mean they can not be identified. In cases where this is not possible, faces have been blanked out to preserve anonymity.

Participating museums have not been anonymised. This is because the participants are not affiliated to the museum, and so revealing the institution will not compromise the anonymity of the participants. However, for this same reason, the participating school is not named.

# Chapter 4. Pilot study

## *4.1 Aims and overview of pilot study*

This thesis aims to investigate both children's natural history museum experiences and the ways in which researchers can gain access to these experiences, and the project began with an openness to exploring both of these questions. The pilot study was vital in converting this openness into a focused research project. According to Jennifer Mason, the purposes of a pilot study are:

to try out sampling strategies, data generation and analytical techniques, to firm up on your intellectual puzzle and your research questions, or to allow you to gain experience of some aspects of the research process' (Mason 2002, p.46).

In accordance with the approach advocated in Grounded Theory, observation notes and recorded interviews were transcribed in their entirety, and initial coding and analysis carried out before moving on to the next phase of the pilot study. This approach allowed research methods to be honed and the study to become more focused.

The main aims of the pilot study were:

- To decide which groups to work with — schools, families or both
- To develop observation techniques, including deciding on whether to focus on one area of the museum, or to track groups as they walked around the museum, how to remain covert, and how to record observations
- To collect initial observations as a way to start developing ideas of how young children engage with museums
- To explore ways of recruiting participants
- To adapt methods intended for long-term use in educational settings to one-off visits in a museum setting
- To work out the practicalities and logistics of each method — the equipment needed, where to carry out interviews in the museum and so on

- To investigate the abilities of young children to understand and engage with different research methods within a museum
- To test the effectiveness of different research methods for uncovering young children's perspectives
- To work out whether it would be possible to create a 'mosaic' from different children using different data collection techniques
- To develop my interview technique
- To find ways of recording the physical and social aspects of the interviews, as well as the verbal
- To decide on whether to work with children on their own or in small groups
- To decide on the degree to which adults would be included in the research as well as children, for example whether they would be necessary to aide the communication between myself and the child, and whether they should add their own perspective of the visit
- To decide on whether to interview adults separately from the children
- To choose which museums to use as case studies.

The pilot studies were carried out in three museums, between late summer 2010 and early spring 2011, and involved both family and school visitors, and working with children from three to five years of age. The phases of the pilot study are listed below. The final phase of the pilot study ran on quite naturally into the data collection proper, so that there is not a specific point at which the pilot studies stopped and data collection began.

*Pilot 1: Herbert Art Gallery and Museum*

Dates: 25<sup>th</sup> & 26<sup>th</sup> August & 1<sup>st</sup> September 2010, during the school summer holidays, and 14<sup>th</sup> October working with a school group in term time

Observations: 10 hours over 3 days, 83 observations

Piloting interview methods: 1 school (3 children aged 5-6) tested drawing and tours.

*Pilot 2: New Walk Museum and Art Gallery*

Dates: 29<sup>th</sup> January & 13<sup>th</sup> February 2011, Saturdays during term-time  
Observations: 2 hours, 9 observations  
Piloting interview methods: 1 family (1 child aged 4) tested photography.

*Pilot 3: Oxford University Museum of Natural History*

Dates: 24<sup>th</sup> to 27<sup>th</sup> February 2011, during school half term holidays  
Observations: 6 hours over 3 mornings, 34 observations  
Piloting interview methods: 2 families (3 children aged 3-5) tested drawing  
2 families (3 children aged 3-5) tested tours  
2 families (2 children aged 5) tested photography.

Further details of the pilot study participants can be found in Appendix 6 ('Table of participants'). The process of developing research techniques will be discussed by technique, rather than in the order in which the pilot studies were carried out. Even though some of the techniques tested in the pilot study were not used in the final research, they are described in order to demonstrate the comparative effectiveness of the final method and to show why certain decisions were made, for example relating to the groups that the research finally focused on.

## **4.2 The pilot study museums**

*The Herbert Art Gallery and Museum:* The Herbert is a city museum in Coventry, with galleries themed around local history, art and nature, which was fully re-furbished in 2008. 'Elements' is a small gallery of 165m<sup>2</sup>, devoted to the natural world. It displays over 800 items from the natural history collections: mostly geology, shells, and butterflies, with some bird and mammal taxidermy. The collections themselves, while numerous, are mostly small in size (the largest being an arctic hare), and take up relatively little room within the gallery, with space also given to interactive exhibits, musical instruments and handling objects. Although small, the gallery is spacious and light, with good lines of sight (see figure 1).

*New Walk Museum and Art Gallery:* New Walk is a city museum in Leicester, with galleries themed around world cultures, art and nature. The nature gallery ‘Wild Space’ was developed in the early 2000s and is a similar size to ‘Elements’, but very different in feel. The collections are much more prominent, including large mammals such as a polar bear and zebra, and the interactive exhibits are much smaller and less conspicuous than at the Herbert. However, the gallery is dark, with poor lines of sight (see figure 2).

*Oxford University Museum of Natural History:* This museum is very different from the other pilot study museums, being a university museum devoted entirely to natural history collections. It is a large, square, open space of 2090m<sup>2</sup> (see Appendix 3: ‘Plan of Oxford University Museum of Natural History’), with many tens of thousands of objects on display. Glass cases are arranged into aisles on the ground floor, and the first floor consists of a balcony that runs around all four sides of the building, lined on three sides with glass cases. The mode of display is quite traditional, and consists mainly of specimens (taxidermy, skeletons, models, fossils and minerals) taxonomically displayed in the glass cases or, for some larger objects, free-standing on plinths. Despite this, it has what Gurian calls a ‘lively’ object-centred style (2006, p.49), in which many of the cases are humorous, curious, or aesthetic, such as displays of Alice in Wonderland, dodo remains, and cabinets of brightly coloured crystals and animals. The central court is dominated by life-sized casts of an iguanodon and a tyrannosaurus, and there are further large free-standing mammal skeletons and dinosaur models around the museum (see figure 3).

What sets it apart from many otherwise similar museums is the large number of specimens available for handling. In 2002, the museum took the decision to put out tables of handling collections — taxidermy, bones, minerals and fossils — onto the gallery floor, in spite of the fact that low staffing levels meant that these objects would rarely be supervised. There is also a line of plinths down the middle of the geology aisle (see figure 4), upon each of which is a large geology specimen that can be handled. Just inside the entrance stand a taxidermy cheetah and Shetland pony, both of which have signs next to them inviting touch. Other than this, a small corner with ‘feely’ boxes and child-friendly drawers and an activity cart make up the only interactive and specifically child-focused elements of the museum.



*Figure 1. Elements gallery, Herbert Art Gallery and Museum.*



*Figure 2. Wild Space gallery, New Walk Museum and Art Gallery.*



*Figure 3. Prehistoric reptile gallery, Oxford University Museum of Natural History.*



*Figure 4. Mineral handling collection, Oxford University Museum of Natural History.*

### **4.3 Initial Observations**

In each of the pilot museums I began the research with a series of exploratory, unstructured observations (Robson 2002, p.311), with the aims of uncovering areas of interest and patterns of behaviour, developing my skills as an observer, creating a system for carrying out observations, and as a precursor to subsequent data collection. In total, 18 hours of observations were conducted in three museums between August 2010 and February 2011.

These pilot studies led to the development of a method of observation that involved watching and writing down the behaviour and speech of groups of visitors as they interacted with particular areas of the museum. While I had initially been unsure whether to track visitors or to focus on particular areas (Bitgood 2002), since the observation of naturalistic behaviour was a priority it was therefore important that visitors should not be aware that they were being observed, and tracking was rejected as being too intrusive. Observations were short — generally no more than around three minutes — depending on how long visitors stayed in the area that was under observation. The area of focus of the observations moved around to capture the interactions of visitors within a range of different areas of the museums.

Across the three museums I observed 126 groups, focusing particularly on the families with young children. Drawn initially to formal, coding-scheme-based observation (Robson 2002, p.313), I experimented with recording sheets, with headings to record group composition, estimated age of children, time, behaviour, speech and so on. Early on two problems arose with this system. Firstly, if the methodological approach was built around allowing visitors to speak in ‘one hundred languages’, then it seemed that it was not appropriate to give precedence to one of these languages — the spoken word — and group all non-verbal languages together in a separate recording space under the heading of ‘behaviour’. Secondly, it was important for me to be able to also record my reflections on the mood of each interaction observed, which was not always clear from a description of behaviour or speech, but was key to capturing the visitors’ *experience* of being in the museum at that moment. I began, therefore, to record whether visitors were interacting closely with each other, learning together, annoying each other, bored, excited, playful and so on. I finally chose to use a notebook rather than observation sheets, as this allowed more flexibility in recording a variety of interactions alongside my own reflections, whilst also being less conspicuous than a

clipboard. The approach became less like market-research style visitor studies, and more closely aligned to ethnographic methods, in which the researcher closely records and interprets participant behaviour (Geertz 1973).

As anticipated, each museum had its own limitations for carrying out covert observations. The Elements gallery at the Herbert museum was a straightforward observation space, with good lines of sight and seating that allowed me to focus on particular areas of the gallery for large stretches of time, although a box of musical instruments meant that certain areas of the gallery were very noisy. Wild Space at New Walk museum was a more challenging space, with poor light levels and lines of sight, and no gallery seating. This made it harder for me to settle in one place, and meant that my observations were more obvious to visitors, who responded to me with noticeable caution.

The Herbert and New Walk museums were small enough to allow observations of visitors interacting with all areas of the galleries, however it became clear that this would not be possible in the museum in Oxford, which is an order of magnitude larger. I was reluctant to choose specific areas to observe, as there was no strong basis for determining the most interesting or relevant areas. Instead, I developed a method which involved walking around the museum in the role of lone visitor, concentrating on the areas in which visitors congregated, and writing observations of families with young children in these areas as they caught my attention. In terms of choosing which areas to focus on, I concluded that the observations were not being used to carry out a thorough survey of visitor behaviour, but rather to expand my knowledge of the possibilities of visitor behaviour within that museum, to better inform my subsequent data collection.

What also became apparent was that, rather than these pilot observations being a useful source of data, they were instead an essential forerunner to carrying out effective interviews. This was because they allowed an understanding of the range of visitor behaviours, and also of the areas of the museum to which the interviewees referred when they spoke to me. The outcomes of these observations will not, therefore, be discussed, other than in the context of the development of my research skills. I did, however, carry out further observations after the main data collection, which were used to triangulate the results, and which will be discussed in section 4.6.2, about the final data collection methods.

## **4.4 Pilot interviews**

As discussed above, the main body of research was to be based on interviews that made use of creative or active tasks to focus the children, to make the interviews more interesting for them, to prompt their memories, and to provide a supplementary mode of expression in another of the child's 'languages'. The development of each of these methods is discussed in the sections below.

In terms of a more general interview strategy, it has been suggested that being interviewed by an unfamiliar adult can be stressful for young children, and a number of researchers recommend interviewing children in small friendship groups, so that the children offer each other support (Critchley 2003; Einarsdottir 2005; Cook & Hess 2007). The plan was therefore to interview children in pairs or with their parents. There was also the possibility of interviewing parents and teachers separately from the children, as is the practice within the Mosaic approach, although logistical constraints could potentially make this difficult.

Prior to beginning the interviews, as well as questions of the effectiveness of the creative methods, it was also necessary to establish the relative weight of the verbal and non-verbal 'languages' within the interviews, as well as the role of the parents or teachers. Most of all, it was clear that if the methods were too burdensome, visitors would be unlikely to agree to take part. The research had to fit with their own ideas about their museum visit and what they wanted from it.

### *4.4.1 Piloting drawing*

Drawing-elicitation interviews were piloted with three school children at the Herbert museum, and three children visiting the Oxford museum with their families. While there is a lot of evidence of drawing being a useful prompt for conversations with children about museums when they are back at home or in school, there is only limited evidence of its usefulness actually within museums (e.g. Kelly et al. 2006). This pilot study therefore tested whether drawing could be used in a more fleeting study, based only during the time of the visit. As well as this, the first attempt at drawing-elicitation at the Herbert museum also provided valuable, and sometimes uncomfortable training in how to carry out research with children.

The first pilot study was with a year one school group (five and six years of age) visiting the Herbert museum for a workshop and spending time in the Elements gallery. The museum agreed to pass on my information and consent forms to the teacher, who would then pass them on to the parents. Unfortunately no parents completed the consent forms, however the teacher gave consent herself for the children to participate, as long as they were not photographed.

I accompanied the children in their workshop and then to the Elements gallery. After allowing the children time to explore, I recruited two girls, Hannah and Martha, following the recommendation of Critchley (2003) that children are often more comfortable being interviewed with friends. These two girls gave the first suggestion that drawing was not a universally appealing activity, as Hannah only agreed to take part on the understanding that she wouldn't have to draw.

I asked Martha to draw a picture of something she liked from the gallery. There is some disagreement as to whether children can be interviewed effectively while they are drawing, with Parker (2003) suggesting that it acts as a useful prompt, but others finding children to be unwilling to speak whilst they draw (Critchley 2003; Hreinsdottir & Davidsdottir 2011). In my research, working with two children meant that I was able to speak to Hannah while Martha concentrated on drawing.

I began by using the sound recorder to record myself giving the location and date, and to record the girls introducing themselves. I played this recording back to them, so that they were comfortable with how the machine worked. This approach was used in every subsequent interview during the research. Using a voice recorder allowed me to focus on the children during the interview, rather than being distracted by having to make written notes.

Martha chose to draw a picture of a sticker collection sheet — an activity provided in the gallery that was very popular with the children. Unfortunately, because I was intent on asking the children about their views on the exhibits, I was dismissive of Martha's interest in the stickers, and did not question her further about why she liked them. Listening back to the interview the next day, I was shocked at how I had skimmed over this feature of the gallery interpretation that was such an important part of the girls' museum experience. Reflecting upon this first pilot study was vital for helping me to develop an openness to the children's interests and, as a former museum educator, a non-didactic mode of speaking to and questioning them.

The first part of the interview involved the girls describing what they could see from where they were sitting. They seemed distracted by seeing their class-mates still playing, and wanted to show me the things they were talking about. As tours were another planned method, I allowed the girls to carry out what was, in essence, an impromptu tour. They seemed to find it easier and more enjoyable to express themselves both physically and verbally in the actual gallery space, and by narrating their activity into the voice recorder, I could allow their activities and play to become a mode of expression. However, it was not clear that the girls were choosing particular exhibits because they were particularly significant, or because of close physical proximity. In total, this interview lasted 8:25 minutes, over half of which was spent interacting with exhibits.

Following this interview I recruited a third girl, Parveen, although no other child would agree to participate, so she was interviewed on her own. Like Martha, she drew the sticker sheet, and this time I probed the reasons for this a little more, although reflecting back, my questions were still too closed, and consisted mostly of asking Parveen what she liked. Parveen's interview was cut short at 3:25 minutes by the class having to leave the museum. As has been the case in similar research (Hreinsdottir & Davidsdottir 2011), Parveen wanted to keep her picture, and so, not having a camera, I instead described the picture into the voice recorder.

Both of these interviews were dominated by the children's interest in the sticker sheets. However, it was not clear whether this was because the stickers were the most interesting thing in the gallery, or because the children were reminded of them by the sticker sheets being next to them as they were drawing. Everything that the girls talked about could be seen directly, suggesting that drawing was not a useful method for prompting children to remember things that they weren't looking at — at least when they were in a location where they could see some parts of the museum but not others (this may be different in school, where children are being asked to recall the visit, but are not able to see any part of the museum, and so are not distracted by objects that are nearby). This suggested that the location of the interview could seriously affect what children talked about. The drawing did not seem to add to the interview, but was simply an incidental activity.

Drawing-elicitation interviews were tested with three more children from two families at the Oxford University Museum of Natural History. I recruited families when I judged that they had spent over half an hour in the museum, and would have had time

to form an impression, asking the child to draw something they liked in the museum while they and the accompanying adult were interviewed about their visit.

As with the pilots at the Herbert, the success of this technique was very limited, although the presence of the children's parents and grandparents did help to keep the interviews more focused. Five-year-old Jane repeated the behaviour of the previous girls in drawing something that was directly in front of her — a small bird — even though she was not able to tell me what sort of bird it was or why she had chosen to draw it. A second interview was even less successful, with four-year-old Barney not being willing to draw anything at all, and his three-year-old brother Jamie telling me, and then demonstrating, that he couldn't draw, but only 'scribble'.

The method seemed neither a useful prompt for the children, nor an engaging activity to make interviews more interesting for them. During these interviews I had to continually prompt the children and try to persuade them with promises of stickers. The children seemed to lack the confidence to draw — possibly due to being asked by a stranger, as well as because of their developing skills in this area, and the unfamiliarity of the museum, which contained many objects that the children did not know how to draw. Children of this age are generally only just learning how to draw people (Cox 1992), and dinosaurs may be something of a challenge. While in the right circumstances children's drawings may depict both their perspective and their interest (Bezemer et al. 2012, p.4), in this situation the children seemed simply and somewhat reluctantly to be following my instructions to complete a task. Their responses were not a reflection of their wider interests from their museum experience, but rather, in following my instructions, they simply drew what they could see.

Einarsdottir et al. note that although many children were eager to draw:

In each study there have been children who did not want to draw, said they 'couldn't draw' or avoided the drawing activity. While regarding drawing as an effective strategy for engaging with children in research, we are cautious about promoting drawing as a comfortable and positive experience for all children. (Einarsdottir et al. 2009, p.228)

While drawing-based research has been used successfully in some settings, Dockett et al. (2011) found that, in their multi-method consultation with young children in a museum, the familiarity of drawing seemed to make it a less interesting option for the

children. I would suggest that individual children do not have a set amount that they like drawing, but rather are more or less likely to be happy to draw depending on the context. Some children will have a higher probability of engaging with drawing within a wider range of contexts, whilst for others the contexts within which they are willing to draw will be very limited. Within my own research approach, the context seemed to make the children's likelihood of engaging with drawing very low.

#### *4.4.2 Piloting tours*

As discussed above, the first — unplanned — pilot of the tour-elicitation approach was carried out at the Herbert museum. The two girls, Hannah and Martha, who had been recruited for a drawing-elicitation interview had initiated their own tour when they decided that they wanted to directly show the things they had seen, rather than talking about these things whilst sitting down. This seemed to stem from a frustration with trying to express themselves verbally, a desire to re-join their classmates playing with the exhibits, and a further desire to show me the things they had found. This 'tour' suggested that walking around a museum with a child, and allowing them to demonstrate how they interacted with elements of the exhibition, was a more natural way for children to express their interests. It allowed them to use both physical and verbal 'languages', and to engage with the museum in a more concrete way than did drawing. However, there was no evidence that this helped the girls to recall aspects of the gallery that they could not directly see.

Tour-elicitation was piloted twice more at Oxford University Museum of Natural History. As with the drawing-elicitation interviews, I recruited families when they seemed to have spent enough time in the museum to form a reasonable impression of it. I carried out and recorded the interview with the children and their families as they led the way around the museum, prompted by my request that they show me their favourite things.

This technique was somewhat more successful than drawing, however, the first child (five-year-old Callum), was incredibly shy and very intimidated by both the process and my presence, as were his family, even though they had been enjoying the museum before I approached them. The second interview with four- and three-year-old cousins Bobby and Nick was more successful, and provided some information about what they were interested in and the ways in which they interacted with the exhibits.

For example, they showed me how they had put their hands inside a model tyrannosaurus mouth, and stroked the cheetah. There were, however, more practical problems with Bobby and Nick's tour as the boys moved at speed through the large space of the museum, which meant that following them and recording their responses on a voice recorder was challenging, and I had to stop them from going upstairs, as their mothers, hindered by a pushchair, could not easily follow. Tours within this large museum seemed to be less logistically feasible than in the smaller Elements gallery at the Herbert museum.

The success of tours used in other studies seems to depend on a number of factors, including the physical and social environment, the way in which the tour fits with the wider research method, and the use of additional technology. So, for example, as was somewhat the case with my initial impromptu tour at the Herbert museum, Baird (2013) found that Mosaic-type tours were unsuccessful in a nursery school because the children were distracted by the activities going on around them. Weier (2004), on the other hand, used tours as part of a carefully structured and more long-term programme of activities. These were not tour-elicitation interviews, but instead guided tours planned and given by the children to familiar adults — an activity which the children found to be exciting and empowering. Dockett et al. (2011) also found tours to be a useful research method, but in this case they were combined with video recording, which is likely to have been a more successful mode of recording a tour than the voice recorder, as it collects children's physical actions as well as their speech.

Within my own study tour-elicitation did not seem to reveal much more about a child's visit than could be achieved through an observation, in terms of revealing behaviour around the exhibits and children's interests. In addition, like the drawing, it provided no way to assist the children in remembering details of their visit. Interviews therefore focused either on the most charismatic and impressive exhibits within the museum, or on the areas of the museum that were closest to or most visible from the place where the tour began. It did not seem to be an effective way of overcoming the limitations of young children's short term recall, and therefore, while tours could show how the children were interacting with the museum at that moment, they could not necessarily show how they interacted during the main part of their family visit.

#### *4.4.3 Piloting photography*

Photography is technically more complex than either tours or drawing. Before beginning the pilot studies it was necessary to select which type of camera to use and how to view the photographs. The two main types of camera used in research with children are digital and single-use disposable, with the type of study determining the most appropriate camera. The studies that use single-use cameras tend to involve a large number of children having the cameras for a significant stretch of time (e.g. Sharples et al. 2003), while in my research I would only be working with one child at a time, and for a short amount of time. For the purposes of my research the immediacy of being able to view the photographs on the digital camera or computer screen was a more important consideration, and I therefore chose this type of camera. It was not clear whether participants would want to be provided with copies of their pictures, however Stephenson suggests that the gratification of seeing their pictures on the camera screen is often enough for children, and they do not necessarily need to have their pictures printed (2009, p.133).

Sharples et al. (2003) suggest that an advantage of single-use film cameras is that they do not have complicated controls. However, digital cameras are becoming increasingly popular in research with children, and within these studies the children do not seem to struggle to use the cameras (e.g. Stephenson 2009; Dockett et al. 2011; Dunn 2012).

One potential disadvantage of digital cameras compared to film cameras is that the researcher has no control over the number of photographs taken by the children. Following a similar approach to Dockett et al. (2011), I chose not to limit the number of photographs that children took. This was partly due to the impracticalities of setting a limit, but also to allow the children more freedom to express themselves through their photography. Like Sharples et al. (2003, p.309), I eventually decided to allow the children to choose which photographs to discuss in their interviews.

I purchased a standard adult digital camera — a Nikon Coolpix L22 (see figure 5) which had the advantages of very simple controls, a large screen, and AA batteries that could be replaced quickly. The photographs could be easily downloaded and viewed on my laptop computer as both thumbnails and full-screen images using the ‘Preview’ application. This would allow the children to get an overview of their pictures and then to select which ones to view and discuss in more detail.



*Figure 5. Camera used with children.*

I piloted photography with one child in New Walk Museum in Leicester, and then, two weeks later, with two more children at Oxford. Beyond testing the effectiveness of the method there were a number of specific questions to address: to confirm what instructions to give to the children, such as whether to ask them to photograph only museum objects or whether to allow them the freedom to photograph

anything they were interested in; whether to offer to share the photographs with the child and their family; and whether to attempt to discuss all of the child's photographs with them, or just to talk about some of them. I anticipated that, as with the other creative methods, the product of the child's activity (i.e. the photographs) would not actually be a significant source of data, but would largely serve as a prompt or talking point for an interview with them about their museum visit.

The first test of this method was at New Walk Museum. In contrast to the methods of drawing and tours, in which families were recruited after they had spent some time in the museum, the participating family were recruited as they entered the Wild Space gallery. I explained the research to the parents, and having gained their consent, four-year-old Rebecca also agreed to take part. I showed her how to use the camera, asked her to take photographs of things that she liked or found interesting, and told the family that I would wait for them outside the gallery so that once they had finished we could look at the photographs together and talk about them.

After around half an hour, Rebecca and her mother returned, and we looked at the images on my laptop. There were eleven photographs, of which we talked about ten. During the 8:43 minute interview, it became apparent that Rebecca had not taken all of the photographs herself — some of them had been taken by her mother, although apparently under Rebecca's direction. In spite of this problem, the interview did reveal aspects of a child's museum experience that had not been revealed by the previous methods. In particular, Rebecca demonstrated that she was very aware of the external features of the animals, making references to fur, fluffiness, colour, skin, eyes and mouths. Her mother told me about conversations they had had whilst looking at the animals, but Rebecca's own answers showed a level of interest in the animals that was not referred to at all by her mother.

Although there were issues with Rebecca's autonomy (her mother having taken some of the photographs it was not clear how much each picture had really been Rebecca's choice), this initial pilot did begin to suggest that the photography-based technique had the potential to reveal aspects of the child's experience that were not available to the adults with whom they were visiting, and so could have genuine value as a research tool.

Two weeks later I piloted photo-elicitation with two more children at Oxford. By this time, I had interviewed six children using drawing-elicitation, five children using tour-elicitation, and one child with photography — a total of ten children across three

museums. I was concerned that there were significant problems with using these methods in the way that I intended. Firstly, the suddenness of recruitment seemed to lead to the children being cautious of me, reluctant to get involved, and limited in their ability to express themselves. More worryingly, the methods did not seem to be helping children to recall their visit. My brief attempt at photo-elicitation in New Walk Museum was the only interview to give me an aspect of the children's perspective that I could not have discovered from observations (Rebecca's interest in the external features of animals). But even this had problems, as Rebecca's mother had taken many of the photographs, which meant that it was not clear how much the photographs really did represent Rebecca's perspective.

In spite of these issues, when I carried out the final pilot studies at Oxford, I was still planning to use all three methods to collect the data, thus creating a multi-modal mosaic of the museum built from many different children's answers. The final day of pilot studies in Oxford would change my mind.

#### ***4.5 Vignette: The interview with Kyle***

On the morning of Sunday, the 27<sup>th</sup> February, I carried out the penultimate interview of the pilot studies. Kyle was five years old, and visiting the museum with his parents and three-year-old sister. I approached the family as they entered the museum and asked the parents if they would take part. Following their approval, Kyle agreed to help me, and I explained to him how to use the camera, and asked him to photograph things that he liked or found interesting. I asked the family to meet me in a nearby area of the museum fifteen minutes before they planned to leave, so that we could look at the photographs and talk about them. To avoid delaying their visit any further, I explained that I would wait until they joined me later before I gave them the consent form to complete.

Kyle and his mother returned one hour and ten minutes later. I explained the research again, gave the consent and information forms to Kyle's mother, and told Kyle that we would look at the photographs on my laptop and talk about them. Kyle was a happy, confident boy, and his 25 photographs prompted a profusion of stories from within and beyond the museum visit, in an interview that, at 14:24 minutes, was almost 50% longer than any of those carried out previously.

I explained that we wouldn't have time to look at all the photographs, so Kyle would have to choose which ones to talk about. While Kyle surveyed his pictures, I

briefly asked his mother about the family’s reason for visiting — they had been to the museum before, and had come back to look at the dinosaurs. However, Kyle quickly took over the interview, beginning with the first photograph he had taken — a taxidermy eagle owl on the handling tables. I asked what he had photographed, and he told me, ‘The owl because it came to my school, one of those owls did... a<sup>6</sup> eagle owl.’

Prompted only by the photograph (figure 6), Kyle’s response showed that he knew the name of the object he had photographed, explained his reason for photographing it, and demonstrated his previous experience with this type of animal. His mother confirmed that when they had seen the owl in the museum, he had told her the same thing. He continued explaining that he hadn’t held the one at his school because, ‘they had sharp claws on their feet’, further demonstrating his knowledge of the owl.



*Figure 6. Kyle’s photograph of the eagle owl and ‘rabbit’.*

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<sup>6</sup> Within these interviews, I will not mark children’s grammatical errors with [sic], but instead allow them to speak uninterrupted in their own voices.

I asked Kyle about his little sister, who was playing nearby. He said she had ‘shouted a lot’, and went on to tell me that, ‘she was down there, down by that, um, elephant thing ... and she said come and have a look at this it’s another dinosaur but it was a elephant!’. Kyle was referring to the elephant skeletons, which we could see from the interview table. I asked if he knew it was an elephant when he saw it. His mother said that she had told him they were elephants, but he disputed this, saying, ‘when my mum was round that other side I saw, I saw a tusk of it’, thus implying that he had worked out what they were for himself. While it is not possible to verify the version of events that actually happened, Kyle did demonstrate from this an understanding of skeletons and elephants, as well as showing that he could remember conversations that he and his sister had had in the museum about an hour beforehand.

I asked Kyle if he wanted to tell me anything else about the owl. He said he also took the picture ‘because the owl was creeping up on the rabbit’.<sup>7</sup> Hence, as well as these specimens reminding him of previous encounters with an eagle owl, he also saw possible relationships between the specimens. I didn’t take this further, but from Kyle’s subsequent comments about predators it seems reasonable to assume that Kyle knew that owls preyed on rabbits, and was therefore led to interpret their relative positions in this way.

We skipped forward a couple of pictures, and next Kyle chose another photograph he had taken at the handling tables, which showed two taxidermy pheasants and a taxidermy otter’s back (figure 7). Without being prompted, he explained that it was a picture of a pheasant, and he took it ‘because I was going to the tip with my Grampy and I ran one over’.

Because the birds were on the handling table, and could be touched, I asked Kyle what he had done when he saw them. However, rather than discussing touch, he told me, ‘I looked at the other one next to it and they were nearly the same’. Rather than picking up on his interesting comparative observation, I asked whether he had touched them, but he told me that he hadn’t. His mother suggested that ‘he was probably too busy taking pictures,’ and Kyle agreed.

I asked if he wanted to tell me anything else about the picture. He said, ‘yeah, the otter down there... I looked at its teeth and it had really sharp teeth on it’. This was not something he could see in the photograph, as the otter’s head was outside of the frame,

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<sup>7</sup> The animal he is referring to is actually a hare. Where it is significant to the thesis, I will indicate children’s misunderstandings. However, this is not always necessary.



*Figure 7. Kyle's photograph of the pheasants.*

but rather something he was reminded of by looking at the picture. Through our discussion, I discovered how good Kyle was at observing the world around him. I was also finding out about aspects of his behaviour during his visit: that he hadn't touched the objects, and some of the conversations between himself and his family as they looked around.

The conversation moved on to Kyle's main area of interest: dinosaurs.<sup>8</sup> Kyle drew my attention to his photograph of a small model plesiosaur, which was in a case next to a large fossilised jaw of the same animal (figure 8). He said that he had, 'seen that one on a dinosaur programme,' but when I asked if he knew what type of dinosaur it was, he said, 'no... it didn't tell us the name on the dinosaur programme', suggesting that, in his opinion, dinosaur names were to be learned from programmes, not from museums.

In spite of not knowing the name of the animal, he was able to make connections between this exhibit and others that he had seen in the museum. He said, 'I've seen

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<sup>8</sup> Within this thesis, 'dinosaur' is sometimes used as a shorthand for 'prehistoric reptiles'. Many of the animals that children talk about — including marine plesiosaurs and flying pterodactyls — are technically not dinosaurs. However, because this thesis aims to give children's perspective, I make use of their terminology.



*Figure 8. Kyle's photograph of a plesiosaur.*

another... I've seen the teeth of it down in that... just down there'. There is indeed a model of a similar plesiosaur several cases away, and Kyle had also photographed this, although we didn't look at that particular picture during the interview. It was interesting to note that not only did Kyle make a connection between these two exhibits, but he also recalled and pointed out the relative positions of their display cases within the museum. Kyle told me that the teeth of this second dinosaur were 'sharp', and then explained that he 'took a picture of what it eats'. We briefly, but unsuccessfully, tried to find this second picture and then moved on.

The next photograph that Kyle chose to look at was of a tuna skeleton (figure 9). The conversation continued as follows:

- Elee:       What's that a picture of?  
Kyle:       A salmon.  
Elee:       A salmon?  
Kyle:       Yeah, it looks like a dinosaur one.  
Mother:     It's a tuna fish, Kyle, I think.

- Elee: It does look like... why does it look like a dinosaur?
- Kyle: Because it looks like a swimming, um... dinosaur like the... um...
- Mother: The bones, do you mean?
- Kyle: Yeah, um... a swimming dinosaur bones.

At the time it seemed that Kyle was making a simple association that many children make, which is that any large skeleton looks like a dinosaur. This certainly seemed to be the assumption that Kyle's mother was making. However, looking again at the context, it seems that Kyle was actually drawing a more specific association between the shape of the tuna and that of the plesiosaur's prey (which turned out to be an ichthyosaur), which he had just been trying to find within his photographs. This is suggested by the phrase 'dinosaur like the ...', which was then unfortunately interrupted and re-phrased by his mother. It may be that he had chosen the tuna as a proxy for the ichthyosaur, which is a similar size and shape.

I asked Kyle if he wanted to tell me anything else about the tuna picture, and he said, 'you can look through its mouth and you can see its tail... I looked through its



*Figure 9. Kyle's photograph of the tuna skeleton.*

mouth when I was taking a picture of it and I saw its tail'. Kyle thus showed that, as someone who is significantly shorter in stature than most adults, he had noticed a visual quirk of this exhibit that was lost to us. Again, he was demonstrating his observational skills, but, more than that, his sense of humour.

Suddenly, Kyle spotted the photograph he had been looking for previously, the ichthyosaur that he knew was the prey of the plesiosaur (figure 10). As with the plesiosaur, Kyle didn't know its name, but he did know its relationship to other animals.

Kyle: That one, it is. That one... that fishy one what we... The one with the big jaws, that's what it eats.

Elee: So the big sea monster one where you saw its jaw. It eats this one here?

Kyle: Yeah, that fishy thing. And when it's eating... when that, is eating it's fish, yeah, it quickly creeps, swims up to it and grabs it.

Elee: Does it?



Figure 10. Kyle's photograph of an ichthyosaur

- Kyle: Yeah.
- Elee: Did you find out about that?
- Kyle: No, I just watched it on the television.
- Elee: You found out on the television and then you saw them here?
- Kyle: Yeah.

Kyle seemed to be particularly good at remembering behaviour, stories, relationships, and also his sources of information. But the act of photographing things in the museum may also have given him another way to remember and refer to the things that he had seen. In this case, he knew that he had photographed the ichthyosaur, and so was motivated to find and talk about his photograph.

For a while, our conversation moved beyond the museum, as Kyle talked about his dinosaur toys and the dinosaur television programmes that he watched. Occasionally he mentioned that one of the dinosaurs was also in the museum. It was clear that he was drawing on the broad experience of a dinosaur-obsessed five-year-old both during his museum visit and in our subsequent interview.

We were almost twelve minutes into the interview — well over the length of time of any previous interview — and I asked Kyle to choose one last picture. His mother suggested the fox, which she said he had liked, but he opted for the ‘velociraptor’ (figure 11).<sup>9</sup> Kyle told me he chose it because, ‘I’ve got a toy velociraptor and it’s not the same but... but my cousin has a... um... velociraptor like it but green’. Again, certain elements of the museum seemed to be particularly salient to Kyle because of his previous experience, and he focused particularly on the physical features of the animals that he was looking at, in this instance noticing the colour of the model.

He then told me that he and his cousin sometimes play ‘velociraptor fights’. This, again, suggests that Kyle was knowledgeable about dinosaur behaviour, and knew that velociraptors were aggressive dinosaurs that might have had fights.

I asked if he wanted to tell me anything else about the velociraptor:

- Kyle: There’s too much on the velociraptor. I can’t really see its tail.
- Elee: No, it’s round the back isn’t it?

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<sup>9</sup> This is actually a life-sized model utahraptor, but was often taken by the children to be a velociraptor, probably because it is similar to the depiction of velociraptors in the Jurassic Park movies.

Kyle: Yeah.  
Elee: Round the back of this picture.  
Kyle: I can see the bottom of it.  
Elee: Yes. But not... it's tail's behind, isn't it?  
Kyle: But I can just see the end of it.  
Elee: Yes, that's right. Just underneath.  
Kyle: But not the rest.

His comments show that as well as the photographs helping to remind Kyle of what he had seen, he was also interested in the way things had appeared to him in the museum compared to the way that these same things looked in the photographs.

I thanked Kyle for helping me, gave him a sticker as his reward, and the family went on their way. My gratitude was genuine. The interview with Kyle was orders of magnitude richer than any of the previous seven. And not only did I have the recording of Kyle and his mother's words, but I also had 25 competently-taken photographs, six



*Figure 11. Kyle's photograph of the 'velociraptor'*

of which Kyle had talked about, but all of which were available for some form of analysis.

That afternoon I used the same technique with five-year-old Fred. The interview went equally well, and Fred showed himself to be both as interesting and as competent as Kyle, whilst having quite a different perspective on the museum. His 28 photographs, combined with his interview, revealed a child much less interested in dinosaurs, but much more focused on reading the behaviour of the animals as suggested by the poses of the models, taxidermy and skeletons.

On reviewing the data from all of the pilot studies, it was striking to note the difference between the interviews carried out with photography and those that used drawing and tours. The children who took part using cameras seemed very much more comfortable in participating, and provided more data, which was richer, more individual, and more independent of the narratives provided by their parents.

## ***4.6 Final Method***

The findings of the pilot study meant that the final approach to the research was significantly different from the planned approach, in terms of both the method and the specific research questions.

### *4.6.1 Findings from the pilot study*

The pilot studies were a vital stage in the research project, expanding my knowledge of the range of visitor experiences and behaviour, allowing me to learn about and adapt the methods and to reflect upon and develop my own skills as researcher, and helping me to narrow the focus of my research.

The initial observations allowed me to develop an observation method, and demonstrated that to carry out effective interviews with museum visitors it was necessary to first observe people in that space. These observations provided vital information about the ways in which visitors interacted with the museum, as well as knowledge of the exhibitions, allowing me as researcher to make sense of the participants' comments in the context of the museum. Because the initial observations are seen as a period of training, the findings are not included in this thesis.

The first interviews with the school children at the Herbert museum demonstrated that my interview technique was too didactic, and needed to be more open and less judgemental of the value of children's choice of subjects. In these interviews I used closed questions, for example asking the children what pictures were shown on the sticker sheets, and using questions to test the children, for example asking Hannah and Martha: 'It's a spiral. Are there any spirals in here?'. As well as my inexperience as a researcher, this problem may have been exacerbated by this first group being school children — a social situation which led me to draw upon my previous professional experience and so to behave more as an educator than a researcher.

The process of listening to and transcribing the interviews soon after they were carried out allowed me to reflect on and adjust my interview style quickly. As the interviews progressed I made an effort to be led by the children and their interests, to actively listen to them, to ask open questions, to probe them for meaningful answers, to respond to their needs, moods and energy levels, and to suppress my own habits of responding to children as an educator. I sought to reduce the image of authority conveyed in my dealings with the children and their families by using informal language and interacting with the children at their physical level (Hill 2005, p.63).

Most importantly, the pilot study showed a significant contrast in the effectiveness of the three 'creative' interview methods, as summarised in table 3. Neither the drawing nor the tours provided any means to assist children in remembering their visit, relying instead on the children's own memories and what they could see around them in the museum. For the very static method of drawing, all of the children depicted objects that were in sight of where they were sitting. The tours gave children the chance to move around the museum and therefore recall more of it, but, while this worked well in the smaller Elements gallery of the Herbert museum, the larger size of the museum in Oxford made a tour of the whole museum impractical. In contrast, photography proved to be an effective and efficient method, reminding the children of the various parts of the museum they had visited, whilst sitting at a table and being interviewed.

Within this research, the children did not seem to engage with the activity of drawing. In a discussion of children's drawing skills at different ages, Cox suggests that young children are 'grappling with the basic problem of how a real, three-dimensional object might be represented in a two-dimensional medium' (1992, p.69). It may therefore be that many young children are not yet skilled or confident enough to depict the range of unfamiliar objects they have encountered in the museum. In many of the

Table 3. Summary of success of methods

Requirement	Interview method		
	Drawing	Tours	Photography
Did the method help the children to recall their visit?	No – it depended on their memories and what they could see during the interview.	No – it depended on their memories and what they could see as they moved around the museum.	Yes – the photographs reminded children of what they had seen and done.
Were the children confident in carrying out the activity?	Mixed – some children were very lacking in confidence in their drawing skills	Generally yes – some children rejected drawing in favour of tours.	Yes – all children were able to use the camera.
Did the children enjoy the activity?	Mixed – the school girls enjoyed the activity, while the family visitors needed the incentive of stickers to persuade them.	Mixed – the school girls enjoyed their impromptu tour, but one of the families was very nervous.	Yes – good feedback from both parents and children
Did the activity meet the expectations of visitors in the museum?	No – drawing and being interviewed was not an activity that children expected to be carrying out in this situation.	Mixed – looking around and talking was typical, showing a stranger around was not.	Yes – other people around them were taking photographs, so this was typical behaviour, although the interview was not.
Was the activity suited to the physical setting of the museum?	No – The children were distracted and did not concentrate on the activity.	Mixed – it worked well in the small gallery, but not in the large gallery.	Yes – the camera could easily be carried during the whole visit.
Was the recruitment method successful?	No – families being recruited at the end of their visit did not have time for the children to become used to the idea of the research.		Yes – recruiting families at the beginning of their visit gave the children time to become used to the idea of the research.
Was the method suited to single-visit research?	Mixed – these methods may be better suited to longer-term research.		Yes – this method worked well.
Did the method provide data in addition to the interview transcript?	Minimal – one drawing per child	No	Yes – on average 50 photographs per child

museum-based studies that have involved asking children to draw (e.g. Moussouri 1997; Hooper-Greenhill et al. 2004) the children are older and therefore more confident at drawing. In studies that have used drawing with younger children, this may be carried out when the children are back in school (e.g. Piscitelli & Anderson 2001) or as part of a structured learning activity within the museum (Clarkin-Phillips et al. 2013). In support of my own findings, Dockett et al. (2011) found in their consultation that young children were not interested in drawing in a museum.

The tour-based interviews also received a mixed reception. Whilst the school girls Hannah and Martha at the Herbert museum actively initiated this activity when they lost interest in drawing, the children giving tours in Oxford were less sure of what was expected of them, and one of the children was extremely nervous of taking part. In contrast to both drawing and tours, photography seemed easy and enjoyable for the children, with many parents thanking me for allowing their children to participate. Although some of the children were more skilled photographers than others, all of them had basic enough skills to produce a set of identifiable photographs. Unlike the tours and drawing, photography as an activity seemed to fit well with the children and their families' expectations of what should happen in the space of the museum, as many other visitors were also taking photographs. This suggests that the appropriateness of different methods depends not just on the age of the children but on the context.

One clear reason for the lack of success of both drawing and tours was that families were recruited at the end of their visit. This was done so that they did not undertake their visit with the knowledge that they were going to be interviewed at the end. However, in doing this the children were required to interact with me immediately, without any prior warning, which understandably appeared to make them nervous. Photography, on the other hand, required recruitment at the start of the families' visits so that they could be given the camera. In an attempt to minimise my influence on their visit they were given very little instruction, other than to photograph things they liked, how to use the camera, and to meet me at the end of their visit. This meant that children had the length of the visit to become used to the idea of talking to me, and this ultimately seemed to give them (and their families) more confidence.

While many methods are designed either to be used over the course of a longer research period, or to be used with a group who have been recruited for a day-long activity-based consultation, my own method needed to fit with (as well as capture) the family's own visit to the museum. It seemed that the museum was too stimulating, too

unfamiliar, and too public for drawing to be used successfully. And while the tours had been successful in the small Elements gallery at the Herbert museum, in Oxford the larger size of the museum meant that it was not feasible for children to essentially repeat their visit to show me what they had seen and done. This meant that the tours focussed on the larger objects that were downstairs, and could not easily incorporate the upstairs gallery. Tours may therefore be better suited to either smaller museums or to research in larger spaces that involves accompanying the family for the whole of their visit. Photography, while it allowed a record of the family's entire visit, was minimally intrusive, and fitted well with the scheme of an everyday visit.

The methods provided differing amounts of data. All three provided interview transcripts, but tours provided no additional data, and drawing just the single drawings carried out by the children. In contrast, photography provided on average 50 photographs per child, which could also be subjected to a deep quantitative and qualitative analysis.

#### 4.6.2 *Narrowing the focus*

Throughout the pilot study, it was intended that data would be collected using a variety of techniques, in an attempt to partially replicate the methodology of the Mosaic approach in which 'each tool forms one piece of the mosaic' (Clark 2001, p.334). The pilot study showed that photography was significantly more successful than drawing or tours, and strongly suggested that this technique could be used on its own.<sup>10</sup> I was concerned that rejecting techniques would provide less rich and rounded data, however, a review of the data gathered during the nine pilot interviews showed that the data gathered using photo-elicitation was significantly richer than that gathered using tours or drawing, with the richness coming not from the *range* of methods, but from the *quality* of the data produced. In addition, while the mixed-method approach is popular within consultations with children, Silverman warns against the use of multiple methods of data collection in social research, suggesting that this may result from not having sufficiently narrowed the focus of study (2010, p.64).

In fact, the pilot study led to the whole research focus becoming narrower than originally anticipated, in terms of the intended research methods, the range of

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<sup>10</sup> A further discussion on the success of photography will be carried out in the conclusion.

participants and the number of case study museums. The decision was made to reject two of the pilot museums and concentrate on just one, because the photographic data was rich enough to justify a comparison of visitor experiences *within* one museum, rather than *between* several different museums, in line with an ethnographically influenced approach. Oxford University Museum of Natural History was selected to be the case study as the entire museum is devoted to natural history collections, rather than a single gallery in the other two museums.

Although the original intention was to work with children visiting in both school and family groups, there were significant difficulties in gaining consent to work with children in schools (attempted during the pilot study at the Herbert museum). In the case of the school that I worked with, no parents gave permission for the children to participate, but the teacher gave *in loco parentis* consent, on the understanding that the children were not photographed. I attempted to organise a second pilot study with a school group, but again no parents gave consent, and in this case the teacher was unwilling to allow the children to take part. The problem of gaining access to children via gatekeepers is, as stated above, well known within research (Silverman 2010, p.434). It seemed that in the case of this research, the problem was compounded by the need for cooperation between multiple gatekeepers.<sup>11</sup> This meant that the research could not be directly explained to the parents, and they could not be reassured as to the non-threatening nature of the project.

In contrast, when working with family groups, it was possible to approach and explain the research to the parents face-to-face, and therefore achieve a much higher uptake of participants. In gaining consent from parents I adopted a similar approach to Sue Allen (2002, p.268), in which I did not ask visitors for written consent at the point of recruitment, but rather waited until they had finished looking around the museum and returned to me for the interview, as this gave them more time to consider the questions that were being asked on the ethics consent form.

In addition to the problem of multiple gatekeepers, I suspected that the initial low uptake was in part caused by the bureaucratic and officious style of the university's standard issue information and consent forms, which I had adapted. Sharon Macdonald (2010, p.84) argues that university ethics policies have been developed more for the needs of stakeholders such as funders than for the benefits of the participants

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<sup>11</sup> I required the museum education officer to pass on my request to the teacher, and then the teacher to similarly communicate with the parents.

themselves. I was concerned that the university's forms made the parents feel anxious rather than reassured, and therefore adapted the forms so that while the content remained the same, the language was less formal, the visual style more similar to school communications, and pictures gave an impression of what the children might be doing. These adapted forms can be found in Appendices 4. and 5. ('Parental information form' and 'Parental consent form').

Although the decision to work entirely with children visiting with their families was based on the relative ease of recruitment of this group compared to school children, Gurian contends that family and school visitors to museums are so disparate that they should not be grouped together (2006, p.23), and the research by Synodi (2014) strongly suggests that, although museums are thought of as free-choice learning environments, when children visit with school groups their museum experiences are more strongly directed by adults. Therefore, this study has taken the form of an in-depth analysis of the experiences of children visiting within the single group-type of families, rather than a comparative study of school and family visits.

Finally, it was originally intended that the project would focus on children aged between three and five years, who are pre-literate but competent verbally. The pilot study included two children aged three years — Jamie and Nick, each of whom was recruited along with a four-year-old sibling or cousin. However, as the research proceeded I found that, although there is a precedent for working with this age group within museum research (e.g. Danko-McGhee 2006; Cook & Hess 2007; Dunn 2012; Hackett 2012a; Clarkin-Phillips et al. 2013), without exception all other three-year-old children refused to participate, even where their parents attempted to persuade them. This occurred after the pilot study, and table 4 shows the numbers of children refusing and agreeing to participate during the second phase of the research, in April 2011.

In my research diary I note that the three-year-olds were all extremely shy of me. This was somewhat less the case for the four-year-olds, and the five-year-old refusal

*Table 4. Children's refusals to participate*

<b>Age of children</b>	<b>Refusing to participate</b>	<b>Agreeing to participate</b>
Three years	5	0
Four years	2	5
Five years	1	4

was not because of shyness, but because the child wanted to take part in the museum’s craft activities. Children’s choice is central to the ethical approach used during this research project, and without their consent it should not go ahead. More practically, it is simply not possible to carry out research such as this with a child who is unwilling to take part, as they will not cooperate. Indeed, as Dockett et al. (2012) argue, respecting children’s *dissent* is as significant in working ethically with them as is their *consent*. It seemed that three-year-old children were too shy to work with a stranger in a strange place, even though they may be capable of using a camera and expressing their views when working with familiar people such as teachers in familiar settings such as schools or in longer-term projects where they are able to become familiar with the researchers.

#### 4.6.3 Description of final method

There was not a clear break between the pilot study phase of this research and the data collection proper. One of the stated aims of this thesis is to discover effective methods for accessing young children’s experiences in a museum setting, and the findings of the pilot study — in particular a comparison and critique of alternative methods — were essential to achieving this aim. In addition, all the pilot participants were actual museum visitors, so that the information they provided added to my understanding of children’s museum experiences. While the data from most of these initial studies was not incorporated into the analysis, the two boys with whom I piloted photography in Oxford are seen to overlap between the pilot study and data collection proper, and therefore are included.

*Table 5. Summary of final method*

Location	Oxford University Museum of Natural History
Method	Children’s digital photography used within photo-elicitation interviews.
Sample	English-speaking children aged four and five years, visiting with their families. 32 children in total, 16 girls and 16 boys. See Appendix 6 (‘Table of participants’) for full list.
Triangulation	Observations of other families with young children in this museum.
Time period	All research carried out during the school holidays of 2011 (February, April and July).

Data collection was carried out in three blocks during the school holidays of 2011. Families were recruited as they entered the museum, and one family participated at a time. I was generally able to work with two or three families per day. Charmaz recommends sampling to be aimed at theory construction, rather than for population representativeness (2006, p.6). The final sample size of 32 was therefore not fixed beforehand, but data collection was concluded when a broad and deep range of experiences had been gathered.

The final methodology is notable in research of this kind for being minimally intrusive. Families did not take part in any kind of research activity before or after their visit, and the collection of data through photography fitted easily into their existing visit schemes. The only significant intrusion into the families' visits was the interview at the end, and parents and children had control over how long this lasted (generally between 10 and 20 minutes — also detailed in Appendix 6). Families were not accompanied or observed during their visit, but were allowed to 'conduct their visits freely and according to their personal agendas' without being influenced by my presence (Briseño-Garzón & Anderson 2012, p.183).

Interviews were conversational, and were based around the children selecting which of their photographs they would like to talk about. This informal, child-led approach put the children at their ease, and gave the flexibility to follow the children's leads. Interviews were recorded using a sound recorder and, as well as speaking to the children I also narrated their actions, for example in this exchange with Josh (5):

Josh: You know the claws on the bottom?

Elee: On his toes? You're pointing to your toes.

In this way the interviews were able to capture some of the children's non-verbal expressions as well as their words.

It was important that the interviews were not didactic, and so where children made mistakes or demonstrated misunderstandings, I did not correct them, but instead explored why they had reached their conclusions. Even their mistakes could help to reveal their thought processes, and where parents or siblings corrected the children, this revealed some of the social aspects of the visit. However, whilst being conversational and non-didactic, I also worked to keep the children focused, whilst being responsive to their needs. Some of the children struggled to choose which photograph they wanted to

talk about (possibly because of shyness, feeling overwhelmed, or being unsure of the process), and in these cases (e.g. Fred) I selected photographs on their behalf. Usually this demonstrated to the child how the interview worked, and they were happy to select other photographs afterwards. Some of the children (e.g. Delia, Karen and Irena) became tired during the interviews, so these conversations were drawn to a close. In some cases, children expressed a desire to stop, but I was able to draw them back into the interview. Greg (4), for example, was distracted by seeing his friend, and wanted to leave the interview to play. However his mother and I managed to talk to him about a final exhibit before he completely lost interest in the interview. This type of approach required a degree of flexibility in the interpretation of the children's 'consent' to participate, and often involved some negotiation with the children. Finally, in some cases (e.g. Marie and Kiet), it was the parents who asked for the interview to finish, while the children were happy to keep talking.

One of the questions addressed during the pilot study was the degree to which other family members should be included in the interviews. It became apparent that it was both appropriate and useful to have other people present — to give the children confidence and emotional support in the unfamiliar experience of being interviewed, to remind the children of aspects of their visit, to interpret some of children's less clear spoken language, and to provide a broader context. Whilst I included other family members, most questions were directed to the participating child to ensure that they remained the main focus and that their's was the predominant perspective to be represented in the interviews.

There was initially some concern about the degree to which parents or siblings could influence the choices that the participating children were making about what to photograph or discuss. However, attempting to control groups in this situation is difficult, and not necessarily desirable as it could potentially interfere with the everyday nature of the visit. I found that it was more important to record the details of each child's social situation, and so to be aware of their differing social contexts. A number of the children (e.g. Kyle, looking at the 'velociraptor' rather than his mother's suggestion of the fox, or Marie, disagreeing with her mother's suggestion that the spider crab was 'scary') showed that they were capable of making their own decisions, and not being swayed by the suggestions of their parents.

As advocated by Grounded Theory, a final collection of data was carried out to test the patterns that had emerged from the main data. Taking place during the Easter

holidays of 2012, this took the form of a series of short observations, which had the purpose of seeking behaviour to corroborate or contradict the interview findings.

In these later observations, as in the pilot observations at Oxford, a method inspired by participant observation was employed, in which I took on the role of a lone visitor with a notebook: a not uncommon sight in this university museum. This allowed covert observation, and also occasional conversational exchanges with visitors, as is commonplace between people in museum settings. Again, my approach was to walk around the museum, looking for visitors with children who seemed to be of the right age group,<sup>12</sup> and observing them interacting with or discussing a particular area of the museum before moving on. No groups were followed, and so each observation consists of a group's interactions with one area or exhibit, which generally did not last more than two or three minutes. In this way, 90 groups were observed over five days, producing nearly 12,000 words of observation notes.

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<sup>12</sup> As noted by Piscitelli et al. (1998, 30) in observations of this type the ages of children can only be estimated.

## Chapter 5. Approach to analysis

### *5.1 Summary and description of data*

The following chapter will discuss the process of making sense of the data, beginning with a discussion of the implications of the methodology for the data produced, followed by a description of the data analysis. This analysis had a number of requirements: it needed to reflect the concern with exploring the rich texture of experience rather than learning and long-term memory formation; it needed to account for the children's varied modes of expression as enabled through photo-elicitation; and finally, it needed to reflect the social nature of the museum experience and of the research method, in which data is created in a collaboration between the researcher, the children and their families.

#### *5.1.1 Types of data*

The following is a descriptive, unanalysed overview of the types data produced. The subtleties and implications of these data types will be discussed in the following chapters. For a complete summary of the data provided by the participants, see Appendix 6 ('Table of participants').

The children participating in the photo-elicitation interviews were as follows:

*Table 6. Children participating in photo-elicitation interviews*

	Aged 4	Aged 5	Total
Girls	8	8	16
Boys <sup>13</sup>	7	9	16
			32

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<sup>13</sup> The uneven numbers of four- and five- year old boys occurred due to an administrative error. All analysis relating to children's age and gender accounts for this by using averages per age and gender group.

The length of time that the children spent with the camera varied from 10 to 105 minutes. While in most cases this represented the child's entire visit, in a few cases it appeared that the family planned to continue their visit once the interview was over. The average length of time each child spent with the camera was just under 40 minutes.

The final data consists of 1,597 photographs and 6:34 hours of interviews. The number of photographs taken per child ranged from 7 to 219 (mean = 50). The interview length ranged from 7:54 to 20:36 minutes (mean = 12:18 minutes).

The photographs and interview together provided a range of data capturing different aspects of each child's visit, consisting of:

- A set of photographs taken by the child, showing the things they 'liked or found interesting'. An example set of photographs can be found in Appendix 8 ('Example contact sheet from Kyle').
- Interviews with the child and members of their family, in which the children expressed themselves both verbally and physically, in response to the visual prompts of their photographs. An example of an interview transcript can be found in Appendix 7 ('Example of interview transcript from Kyle').

The photographs can be divided into:

- Photographs that were mentioned in the interviews. Overall, 266 photographs were mentioned in the interviews (16.6% of the total), ranging from 4 to 16 per child (mean = 8.4).
- Photographs that were not mentioned in the interviews (83.4% of the total).

The photographs also contained information about:

- The location of the photographs within the museum. An example map of the locations of a child's photograph can be found in Appendix 9 ('Example of child's photograph map from Kyle').
- Metadata from photographs, for example time stamps (giving information about visit lengths).

In addition to the photo-elicitation interviews, there are 90 short observations of other families visiting the museum, conducted with the aim of exploring the themes that arose in the interviews, and for the purposes of triangulation. Examples of these observations can be found in Appendix 10 ('Examples of observation notes').

### *5.1.2 Representativeness of the data*

There are two important questions regarding the representativeness of the data collected: firstly, to what extent are the participants representative of children in general, and secondly, to what extent does data produced in this way represent the types of experiences that children have in this museum?

The participating children were not chosen to represent a cross section of society. The only requirements for participation were that they were the right age, and could confidently speak English. There was a high element of chance in the recruitment process, as all families who met the criteria were approached until a group agreed to participate.

From a socioeconomic perspective, this museum is in a wealthy area of a city renowned for its high levels of education, and this is likely to be reflected in its visitor profile, although the participants' postcodes show that more than half (19) came from outside of Oxfordshire. Gurian has noted that the family visitor base for museums tends to be well educated and reasonably affluent (2006, p.24), and this appeared to be largely the case with the visitors to this museum. For the purposes of this research, however, data about the families' socioeconomic and educational status was not collected. This was in part because the research focus is the children's personal experiences, and the broader social context is beyond the scope of the project. In addition, a sample size of 32 can not cover the range of socioeconomic backgrounds of children visiting a museum. Finally, the research was designed to have a minimal impact on the participating families, and questions of this type were judged to be intrusive. Therefore, rather than assuming that the findings of this research are generalisable to all children, the aim of this research is to provide an in-depth analysis of the museum experiences had by these particular children, whom, it is assumed, are at least reasonably typical of visitors to this particular museum.

An alternative approach to viewing the rich data produced by this small sample of children has been employed, which, whilst not assuming the findings to be

generalisable, sees them as ‘everyday’ or ‘typical’ experiences. What sets this group of disparate, but equally everyday experiences apart from all other visits is that, through the research process, they have been captured. Geertz states that:

The ethnographer “inscribes” social discourse; *he writes it down*. In doing so, he turns it from a passing event, which exists only in its own moment of occurrence, into an account, which exists in its inscriptions and can be consulted. (Geertz 1973, p.19)

This bears a strong similarity to Fasoli’s comment about the use of photographs in research, which, she says, “‘slow down’ activity and provide a static and visible ‘moment’ available for repeated reflection and multiple meanings’ (2003, p.43).

Through both photography and conversation this research is allowing the experiences of 32 children to be captured and explored in ways that most children’s experiences can not be. Indeed, given the methodology, it is perhaps apposite to see the research as capturing (or creating) ‘snapshots’ of typical visits. This is both metaphorical, in the sense that small moments in time are being taken as representative of visits more generally, and also literal, in that these moments are in part being captured through photographs. In a similar way the later observations capture smaller, but more numerous snapshots of the experiences of other visitors. This collection of visual, verbal and behavioural snapshots can be used together to explore patterns of everyday visitor experience.

As well as questions of the representativeness of the sample, there are also questions of the representativeness of the museum experiences of the children, given that they have taken part in research during their visits. This question will be addressed in greater depth in the following chapters. Nevertheless, although it must be the case that the children’s visits were affected by having a camera and by knowing that they would be speaking to me, efforts have been made to keep the research methods as unobtrusive as possible. To account for this, both myself and the camera are openly discussed in the analysis of the data, thus making more visible the ways in which participation in the research may have affected the children’s visits. In addition, the final observations of other families help to show the ways in which the children’s accounts of their experiences are or are not representative.

### 5.1.3 Evaluating the photographs as data

Possibly the most fundamental question that can be asked of a photograph is ‘what is it of?’. While, in most cases, the children’s photographs have a very clear single subject, a significant number capture several objects, for example pictures of the handling tables or of cases containing many small objects. It seems from the children’s explanations that they generally intended to photograph one object at a time, with this intended subject usually in the middle of the photograph, for example in the following conversation with Amy (see figure 12):

Elee: So what’s this a photograph of?

Amy: Um ... I was mainly taking that picture but by mistake I got the other bits.

Elee: Oh, ok, so this thing in the middle. Do you know what it is? ... What is it?

Amy: A fossil.



Figure 12. Amy’s photograph of a fossil.

Following this ‘rule’ of children framing the photographs around a single central subject, it is generally (although not always) possible to work out the children’s intended subjects.

As this suggests, one of the characteristics of photographs that is not true of other types of data is that they can contain incidental information, beyond the intended subject. Most interesting for the purposes of this research are the aspects of other visitors’ experiences that have been captured in the background of children’s photographs — for example people leaning, pointing, touching or photographing. Some of these images are included in the analysis, alongside the observations, as a way of revealing the social context within which children’s visits take place, and the types of behaviours enacted by themselves and others.

As well as considering the various subjects of the photographs, there are potentially varying degrees of ‘significance’ for each of the children’s photographs. Cook and Hess warn against homogenised preconceptions of how children relate to and make use of cameras (2007, p.42), and in this research the threshold for what made something interesting enough to photograph was clearly very different from child to child. Thus the number of photographs that each child chose to take can not be equated with the amount of interest they had in the museum: a large number of photographs may be indicative of the child having a high level of interest in the museum objects, or may result from them being more interested in using the camera.

During the interviews there was rarely time to discuss all of the photographs, and so children were asked to choose which they wanted to talk about. While this potentially gives these discussed photographs more weight, in practice this is not straightforward. For example, some photographs were discussed for a significant amount of time, while others were only mentioned fleetingly, or may have been chosen by myself or a family member rather than by the child. In addition, children who took a small number of photographs were able to discuss a greater proportion of them than those who took a large number. This meant that Maisie, who took 7 photographs, was able to discuss 100% of them, while George, who took 219 photographs, discussed only 10 of them, or 4.5%.

It can also not be assumed that the discussed photographs were of the objects that were most interesting to the children during their visit. It may be that some subjects are harder for children to talk about than others, which could skew children’s choices towards objects that they are able to easily name or describe. There will also inevitably

be an element of chance dictating children's choices of photographs. Therefore, while it has been of moderate interest to carry out a survey of which subjects children chose to discuss in their interviews, this can only be used to suggest patterns, not to prove them.

#### *5.1.4 The social nature of photography*

Following the first photography-based pilot study, in which Rebecca's mother took some of the photographs, it became important to reiterate to all of the participating children that they should choose for themselves what to photograph, and should not let anyone else use the camera. In spite of this, there were clearly cases in which family members influenced children's decisions about what to photograph, although there was only one other case of the camera being used by another family member (Anna's father made her share the camera with her older sister 'otherwise they just fight over it'). More common were situations in which family members made suggestions to the children of what to photograph. An example can be seen in the following extract from Miriam's interview, in which the family, including her father and her older brother, Elliot, are discussing Miriam's photograph of the glass ceiling of the museum (figure 13):

- Elee: So did you notice that by yourself or did somebody show that to you?  
Miriam: Daddy did.  
Elee: You looked up together did you, and saw it?  
Elliott: No, daddy just told Miriam to...  
Father: Have a look, didn't I?  
Elee: Did daddy say you should take the picture or did you decide to take the picture?  
Miriam: I decided to.  
Elee: You decided to...  
Elliott: No, daddy had said.  
Father: I think I did say, to be fair,  
Elee: Yeah?  
Father: But then you wanted to.  
Elee: You seem like you, you wouldn't do something if you didn't think it was a good idea, would you?  
Father: No, we had that quite a few times [*laughs*].



*Figure 13. Miriam's photograph of the ceiling.*

Elee: [laughs] So did you make some suggestions, and then Miriam decided that she didn't want to photograph them.

Father: Yes [laughs]. She knows her own mind.

Elee: So these photographs are of the things you like in the museum, are they? Yeah?

Rather than seeing situations such as these as undermining my method, I am accepting them as inevitable. As Fasoli says, 'photographs have to be seen as social constructions, that is, artefacts of the contexts in which they were constructed' (2003, p.36). The children are visiting the museum within the social context of their families, and other members of the group influence many aspects of the children's lives, including their interests and areas of focus within the museum. From a more practical perspective, it is reasonably clear from the interviews which children are most heavily influenced, and this has been taken into account in the analysis.

### 5.1.5 The nature and status of the interview data

The interviews all took place within the public space of the museum, in the final moments of the families' visits. This in itself presented certain challenges. The recordings have background noise from the museum, which at times makes it hard to hear what the children are saying. The interviews were sometimes rushed or cut short abruptly, and the participating children sometimes distracted by other people around them. However, it was also stimulating for the children to be in the gallery space, and they often looked around and pointed in the direction of the things they were talking about. Like the photographs, the interviews therefore took place within a social and physical context, which is acknowledged within the analysis.

As expected, children's memories of their visit were not always clear (Farrar & Goodman 1990). The photographs provided a very useful visual *aide-memoire* that allowed the children to remember much more than they would have otherwise, and that maintained the flow and focus of the conversations. But in addition to the photographs, family members were often invaluable in filling in gaps in what had been said or done during the visit.<sup>14</sup> Parents and other family members were always invited to take part in the interviews, although the degree of participation varied from case to case. Table 7 shows that on average the children accounted for 60% of the participants' responses in the interviews, and other family members, including adults and siblings, accounted for the other 40%. It was common for family members to fill in where the child struggled to answer a question: some were quite dominant, some barely spoke, and one (Haden's mother) left myself and her son alone while she attended to other members of the family (this wasn't ideal, but didn't cause significant ethical problems, as we were in the public space of the gallery).

Table 7. Responses by children and other family members

	Maximum	Minimum	Mean
Child	88.9%	8.6%	60.1%
Other family members	91.4%	11.1%	39.9%

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<sup>14</sup> For example, Fred's mother helped him to remember their conversation as they were looking at the white rabbit. Jack's father told me why Jack had photographed a small crab rather than the spider crab. Greg's mother reminded Greg and his brother that they had seen red pandas at the Cotswold Wildlife Park.

While the children's words can be seen as conveying their internal thoughts and feelings at the time of the interview, it may be that parents are more reliable when it comes to remembering concrete information relating to past events. There can, however, be conflicts between the accounts of parents and children. For example, as was shown in section 4.5, Kyle and his mother disagreed about how he and his younger sister had found out that the large skeletons were elephants. He started by telling me what his sister had said:

- Kyle: [S]he said come and have a look at this it's another dinosaur but it was a elephant!
- Elee: [...] Did you know that it was an elephant when you saw it? Kyle?
- Kyle: Yeah, because it... it had...
- Mother: Mummy told you, didn't I?
- Kyle: Yeah, because I saw... when my mum was round that other side I saw, I saw a tusk of it.

Kyle's mother is saying here that she told him that the skeletons were elephants, but Kyle claims that he worked this out for himself before she saw them (when she was 'round that other side'). Without having accompanied the family on their museum visit there is no way of prioritising one account over the other, and in this case it is possible that they are both giving accurate accounts, as Kyle may have noticed the tusks for himself before his mother drew his attention to them. What *is* apparent from the interview is that Kyle understands that the skeletons do not look like typical elephants (lacking trunks and ears), and therefore might be mistaken for dinosaurs (many children mistake large mammal skeletons for dinosaurs), but that they can be identified as elephants by their tusks. It is not, however, clear whether this understanding came from his own observation or from his mother's explanation.

What does seem to be the case is that the children were less able than adults to distinguish between knowledge or emotions from the past, and knowledge or emotions at the time of the interview. Thus it is not always clear whether children's observations were originally made when they looked at the objects in the museum, or whether they arose only when they looked at the photograph. For example, Delia said that she photographed the tyrannosaurus because it was brown, which may be the case, or it may be that, struggling to articulate the reasons for her interest in this dinosaur, she simply

described a feature of it that was apparent from the photograph. Likewise, some children gave improbable explanations for why they took photographs, for example Marie, who said that she photographed a snake with eggs because ‘I wanted to see them on computers’. Here, Marie’s explanation is unlikely as she did not know at the time of taking the photographs exactly how we would be viewing them during the interview.

For some children, the interview format itself appeared to have had a negative impact on their ability to remember, as was the case for Bonnie, who, according to her father, knew a lot about sharks, but who was unable to tell me anything about them. There was also a suggestion from the final observations that some discussions commonly heard in the museum were not arising during the interviews, for example children questioning the ‘realness’ of the model or taxidermy animals, a phenomenon which is discussed further in chapter eight.

There is a danger of discounting a child’s explanation as unlikely, in favour of the adult ‘informed’ explanation, for example arguing against Delia’s explanation that she photographed the tyrannosaurus because it is brown, in favour of my own explanation that (for example) she photographed it because it is fierce. Care is needed to avoid the imposition of my own explanations, as this undermines the approach of giving voice to the children. Although there may not always be evidence of the degree to which children’s responses to photographs represent their responses to the same objects in the flesh, there are conclusions that can be drawn from the interviews: firstly, that the child demonstrated their interest in that object by photographing it, and secondly that the explanations they do give are personal to them. The children are still demonstrating their ability to make observations and draw out comparisons, relationships, associations and stories from these objects. Within the analysis, children’s versions of events are therefore acknowledged, but are scrutinised for evidence of what happened during the child’s visit, of their emotional responses, and of their understandings of the things they encounter in the museum. It is also possible that the accounts children provide through their multiple languages may contradict each other. Therefore, whilst taking children’s explanations seriously, it is also important to be cautious of taking them at face value. But even where children’s memories conflict with other evidence, their statements show what is salient, thinkable and imaginable for that child.

It is also important to re-acknowledge the children’s multiple ‘languages’, and that they may sometimes find it easier to express themselves through the photography or through their behaviour than through verbal language. Certain

experiences are potentially less verbal than others, and so can be lost when using words to express experience. Experiences that are built around verbal language (such as learning conversations or storytelling) are likely to be easier to express through words, whereas sensory or emotional experiences, which are not in themselves verbal, may need to be translated or inscribed into verbal form, or expressed through other means, before they can be discussed. In addition, when children are nervous, confused or have very limited understanding, they can be rendered almost speechless. Sometimes children's lack of ability to describe an object can reveal something about their experience of it — that it is interesting to them but that they don't yet have the words to explain, and that verbal language is developing in tandem with their understanding of the world. This may be the case where children's descriptions seem odd or incongruous — for example Delia's comment about the brown tyrannosaurus.

By borrowing the Reggio Emilia concept of 'one hundred languages' (Malaguzzi 1998), this thesis accepts both the verbal and non-verbal as valid modes of expression. Non-verbal languages such as photography or physical gestures can be seen as quieter languages, easily overlooked without this framework. While the children's words are captured by the voice recorder, and their visual expression captured through the camera, I have also attempted to capture children's physical behaviour during the interviews by narrating their embodied responses, which ranged from nodding or shaking their heads, to pointing, to feeling their own teeth or bones, to impersonating the animals they were talking about. Through narration it has been possible to acknowledge this physical language and incorporate it into the interview transcripts as another mode of expression.

In addition, while there are some questions as to the reliability of children's memories for past events, it also seemed to be the case that the multimodal nature of this research method aided the children's recall. As well as being reminded of the visit by talking about their photographs, there is also some suggestion that the act of photographing may have helped the children to remember. For example, Kyle talked about things that he had photographed, but without actually looking at the picture, and also looked for pictures of things that he remembered photographing. It seemed that the act of taking photographs had added an additional layer of structure onto the visit, so that by looking at one picture, Kyle could remember the things he had done soon after seeing that object, or the other connections he had made around that time. This memorability may be because photography is itself a multimodal activity — it is both tactile and visual, and can be more active and intentional than using vision only

(Gallace & Spence 2008). Thus, not only does looking at photographs prompt memory, but that the act of taking photographs creates memorable markers of the visit.

### *5.1.6 The researcher's presence within the data*

As a qualitative study, which makes use of a conversational style of interview, this research depends to a large extent on my own responses to the participants. It is therefore important to acknowledge my presence within the production of the data. By making my contribution visible, I can also make clear the extent to which the data produced actually represents the perspectives of the child participants, as well as of their families.

Section 4.6.2 above outlines the interview approach, which included both prompting the children's explanations and narrating their physical actions. The extent to which I influenced the direction taken during the interviews varied from child to child. More confident children, such as Kyle, quickly understood their role and took a lead in choosing photographs and giving explanations. Quieter, or less confident children required more prompting from me, sometimes through questions and sometimes by actually choosing the photographs to discuss. It is the context of the interview that reveals the degree to which children's statements are led by my own questions or prompts. I have therefore been careful to include and account for this context in the analysis, and in extreme cases have discounted what the children say as unreliable, where it is not possible to ascertain whether they are giving their own opinions or simply reflecting what I say. There are also points in some interviews where, on listening back, it is clear that I have misheard what a child or their parent has said to me. Again, this data is discounted from the analysis.

It may also be the case that my presence in the museum affected the children's choices of what to photograph. A review of the location of children's photographs shows that very few pictures were taken of the cases either side of the table at which I sat waiting for the children, which suggests that they may have been cautious or shy of coming near me on their own. However, the cases directly behind where I was sitting are heavily photographed, suggesting that the children were spending time watching me from behind (although none photographed me). This can be seen in the maps showing the locations of photographs, in which my position is marked by the larger blue spot (see Appendix 9: 'Example of child's photograph map from Kyle')

My presence was also, although to a lesser extent, significant in the final observations. During this data collection, I found that visitors occasionally spoke to me. I was keen to keep these interactions to a minimum, as I did not want to reveal myself as a researcher. However, it appeared that an openness to interacting with strangers is one of the social rules of museums, and as I had taken on the participant-observer-inspired role of lone museum visitor, I allowed occasional brief conversations, as these sometimes revealed interesting aspects or insights into the visitor experience. However, I ensured that my own role in these interactions was clear by recording the conversations in my observation notes. Again, in any discussions about visitors with whom I spoke, this information is included in the analysis.

## ***5.2 Approach to data analysis***

The following section discusses the practical and technical ways in which analysis of the data was carried out. As Allen (2002, p.272) advises, the analysis depended on my becoming as thoroughly familiar with the museum as possible, to allow both an understanding of the objects and areas to which the children referred in their interviews, and to identify the locations of the photographs. All of the data was subsequently coded as fully as possible, using an open approach advocated by Grounded Theory (Glaser & Strauss 1968; Charmaz 2006), which aimed ‘to describe the salient features of the data, as far as possible guided by the evidence rather than adult preconceptions’ (Sharpley et al. 2003, p.306). Particularly in the analysis of the photographs the coding (or tagging) was essential not only to show patterns within the data, but also to allow navigation through the data. This was because the content of images can not automatically be searched in the way that can be done with text.

While the approach has been primarily qualitative, the analysis also makes secondary use of quantitative approaches, for example by counting and comparing the instances of certain codes or categories. The sample size of 32 is too small to draw out meaningful statistical patterns such as demonstrating children’s interests in particular subjects by age or gender, and while it is possible to mine the data for rough patterns or suggestions, there is not a broad enough range of data to iron out irregularities. Therefore, all numerical analysis is located within the qualitative framework by taking into account the contexts within which these patterns occur.

### *5.2.1 Process of analysing interviews*

Interviews were transcribed in full as soon after recording as possible, which was vital for recording meanings or actions that weren't obvious from the sound recording, but that could be remembered from the interview. Particular challenges to transcription included the noisiness of the public space of the museum and the varying levels of clarity in the children's speech, and in a very small number of cases parts of the recording were unintelligible.

Following transcription, the complete interviews were coded using the qualitative analysis tool NVivo. Examples of code categories that arose include:

- The names of museum objects
- Descriptive words: colour, size, texture etc.
- Mentions of animal body parts: teeth, eyes, legs, skin etc.
- Discussion of animal behaviour: movement, noises, predation, protection etc.
- Other information sources: books, films, television, school etc.
- Feelings about museum objects: interesting, nice, scary etc.
- Recalling conversations in the museum
- Discussions about family members
- Demonstrations of the child learning.

A full list of interview codes can be found in Appendix 11 ('All interview codes from NVivo').

Coding was an iterative process which attempted to respond openly to the types of patterns that arose in the interviews, whilst also using judgement as to the value of the children's, their families' and my own utterances for demonstrating aspects of the children's museum experiences. In particular, children's comments have been discounted if these are direct responses to closed questions: for example if I directly asked a child to tell me the colour of an object, their response is not a useful piece of information, as the question simply tests the child's knowledge of colours, rather than revealing their own perspectives and meaning-making within the museum.

The program Microsoft Excel and the writing program Scrivener were used to sort and group the coded text once it had been processed through NVivo.

### *5.2.2 Process of analysing photographs*

Before coding the photographs, it was necessary to identify their locations and exact subjects within the museum. This was a laborious process which involved walking around the museum with printed copies of the photographs, and marking each child's set of pictures onto a separate map of the museum. The subjects of some photographs could only be identified with the help of long-serving members of the museum's visitor services staff. This data was transferred onto a map using the program Photoshop, which allowed the locations of each child's set of photographs to be added in layers to a single museum floor plan. This enabled the creation of maps that show each child's photographs separately, and can also bring them together by, for example, age or gender. An example can be seen in Appendix 9 ('Example of child's photo map from Kyle'), and the complete map in section 6.1.1.

As discussed in the above summary of the data, the photographs fall into two categories: those that were mentioned during the interviews and those that were not, with the latter category accounting for 83.4% of the total. Einarsdottir (2005, p.538) argues that without children's explanations, photographs can only tell a partial story. However, within the methodological framework of this thesis children's photographs are seen as a mode of expression, and while the pictures can speak more deeply of children's personal experiences when accompanied by the children's own explanations, there are aspects of the children's visits that can be expressed through the large number of un-discussed photographs. In this I am in agreement with Dockett et al., who argue that, even without children's verbal explanations, the wider context of photographs allows them to 'generate powerful messages about children's competence and the questions and issues they are engaged with' (2011, p.28). The issue is therefore the degree to which each of the photographs is analysed with reference to the child's stated intentions in taking each picture, and the degree to which the analysis is based on my own interpretation of the pictures.

However, the split between discussed and un-discussed photographs is not simple. Some photographs were chosen and lengthily talked about by the children, whilst other pictures may have been very briefly mentioned, or may have appeared in the interview because they were chosen by myself or a family member. The photographs were therefore treated in two ways: firstly, as an element of the interviews, to be used in close association with the text; and secondly, as a way of revealing the overall patterns of

children's attention within the museum as shown within the subjects of their photographs. While only the discussed photographs could fall into the former category, the entire collection falls into the latter.

To explore these patterns, the photographs were extensively organised using a system of tagging, in which each picture was assigned multiple tags, using the program Devonthink Pro. An example screenshot can be seen in Appendix 14 ('Example screenshot from DevonThink Pro'). Much of this tagging is descriptive, attempting to capture all of the information shown in each photograph. So, for example, tags show the main objects in the image (by type and subtype), the age and gender of the child, the modes of museum display (e.g. glass case, handling), the form of object (e.g. skeleton, taxidermy, etc.), whether there are people in the image, and so on. (For a full list of tags see Appendix 13: 'All photograph tags from DevonThink Pro'.)

While this exhaustive description of the photographs has proved extremely useful for navigating the pictures and revealing certain patterns, as discussed in section 5.1.3, it is also important to attempt to determine the *intended* subject of the pictures. This has been challenging in the small number of cases in which an undiscussed photograph captures several objects. As mentioned above, it does seem from the interviews that most children tended to photograph a single object, with this intended subject usually in the middle of the photograph. However, caution has been exercised when making judgements about the intended subjects of photographs, particularly where there is not a clear central subject or where the children seem to have struggled with framing their photographs. In these cases all objects within the photograph are tagged.

A small number of tags specifically reflect themes arising from the interviews. These particularly relate to an interest that the children shared for predatory animals, which necessitated a grouping together of animals that would otherwise appear in separate categories, for example foxes, crocodiles and predatory dinosaurs. I was guided in this categorisation by children's own discussions, tagging an animal as a predator if: a) the children tended to deduce from the specimen that it was predatory, for example by its sharp teeth or because it appears to be stalking another animal; or b) the children generally seemed to know that the animal in question eats other animals, even though the specimen on display was not in an aggressive pose, for example the cheetah or crocodile. Children seemed to associate owls with being cute rather than aggressive, and so these were only tagged as predatory where their pose was interpreted by the children as stalking behaviour. Most other categories discussed by the children could be

navigated using the descriptive tags. For example, I could identify photographs of shiny objects by using the tag ‘crystals’.

In this way, by responding both to the photographs and to the ways in which the children discussed them, I created a system that allowed navigation and deep familiarisation with the photographs, provided extensive information about where and what the children were photographing, and could be easily used in association with the interviews.

### *5.2.3 Process of analysing observations*

The final set of data to be analysed were the observation notes. These were transcribed electronically soon after completion of the observations, with short-hand notes being re-written as long-hand descriptions while the observations were still fresh in my memory. As with the interview transcripts, the observation notes were analysed using an open coding system in the programme NVivo. The observations were carried out with the intention of exploring the themes that arose during the interviews, but while coding was carried out with these themes in mind, I did not specifically use the same codes as for the interviews, but rather began the process afresh. A full list of observation codes can be found in Appendix 12 (‘All observation codes from NVivo’).

## **5.3 Framing the analysis**

The analyses and discussions of the findings will be presented in tandem over the following three chapters. The aim is to show the breadth of these children’s museum experiences, to reveal patterns across the group and to explore in depth the details of these children’s accounts of their visits. A framework has thus been important to allow the handling of this extremely broad range of data. Although many frameworks have been devised to tackle visitor experience, I felt it necessary to develop one that addressed the specific requirements of this project. The first of these requirements was to present the data as much as possible from the children’s perspectives. As argued in the Literature Review (Chapter two) much research around children in museums focuses on learning. Influential learning-based frameworks include the Generic Learning Outcomes (Hooper-Greenhill 2007) and the Contextual Model of Learning (Falk & Dierking 2000). In contrast, within my own project, while questions of whether

and what the children were learning are raised, this is only to the extent that they were part of the individual child's experience of the museum, and is framed in terms that make sense of the child's own perspective. The second requirement was, where possible, to give more equal weighting to the verbal, non-verbal, conscious and less-conscious elements of experience. Many of the studies described by other authors give particular weight to verbal data from participants (e.g. Tunnicliffe 2000; Crowley et al. 2001; Ash et al. 2007; Melber 2007), which must necessarily have an impact on the conclusions that are reached. By giving weight to data that includes children's physical behaviour, photographs, and feedback from their parents, as well as the children's own words, this analysis seeks to give a rounded picture of what it is like to be a child in a museum, even to the extent that children are not able to voice this directly for themselves. The third requirement was to present the data in such a way as to shed new light on museum experience, or to view it through an unfamiliar lens, that allow aspects of experience to be seen or appreciated that are less visible in more commonly used frameworks.

### *5.3.1 Model of children's museum experiences*

The analysis and discussion is thus framed in such a way as to reflect the children's attention and activities during the time of their visits to the museum, as revealed through the grounded analysis of the data. The children's museum experiences are presented within a framework in which each element is described by a verb, highlighting the active role of the children in creating their own museum experiences:

1. Navigating and negotiating: the process by which the children gain an understanding and take control of the physical and social setting in which they find themselves.
2. Lighting up: the ways in which elements of the museum become more or less salient to the children.
3. Making sense: the ways in which the children intellectually and imaginatively engage with elements of the museum.

Figure 14 attempts to visualise this division of the children's museum experience over time. These three elements of experience are all expected to be present to some extent

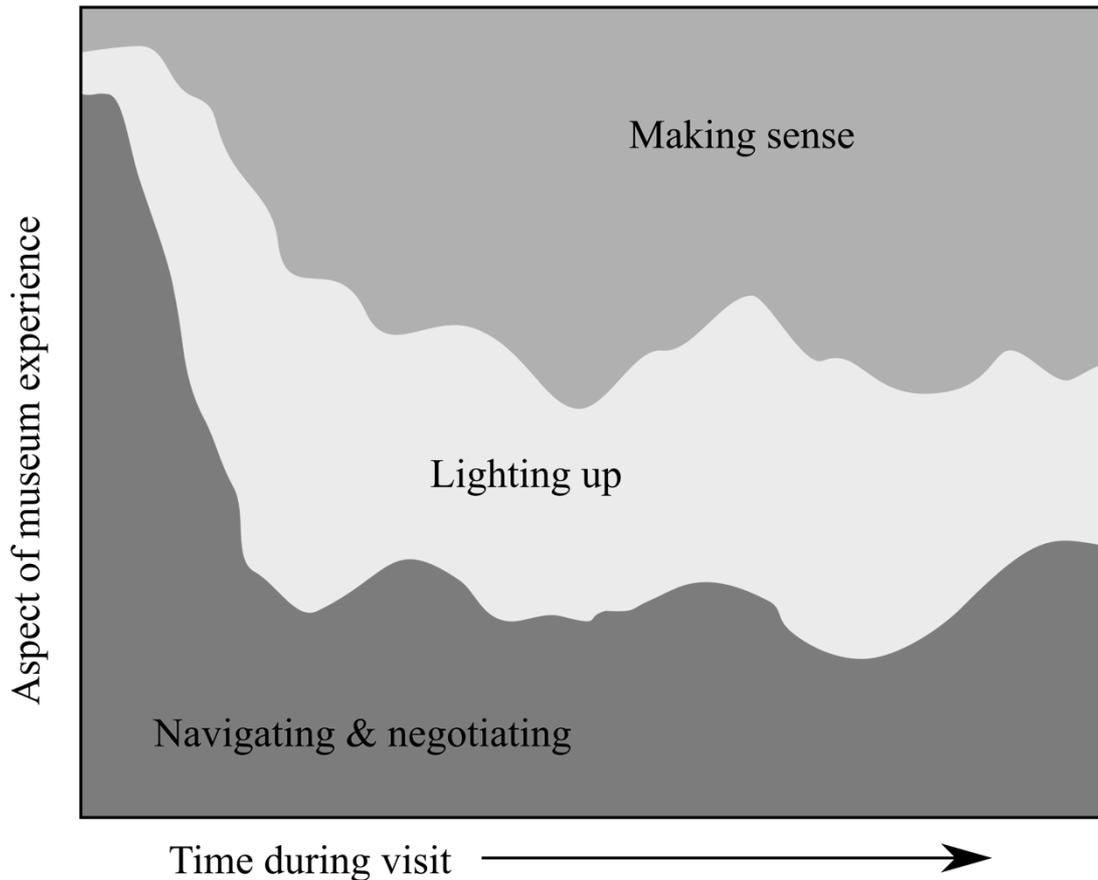


Figure 14. Model of museum experience.

throughout the entire visit, from the moment the child enters the museum to the moment they leave. However, this research as a whole suggests that the process of *navigating and negotiating* dominates the experience at the beginning, with *lighting up* soon becoming more significant, on the basis of which children go on to *make sense* of their museum experience.

In the above visualisation of this model (figure. 14) the significance of each of these processes is shown to fluctuate throughout the visit. The dominance of each process, the fluctuations between them, the influences of each process on the others, and the depth and type of attention given to the museum will be different for each child.

The chapters in this analysis section follow this model of experience. Because these elements of the visit each affect the other, throughout the analysis themes such as sociality, sensory engagement, the physical environment of the museum, and the effect of the camera will arise repeatedly.

### 5.3.2 Focus: patterns or individuals?

The analysis attempts to reveal patterns across the participants, whilst also acknowledging differences between children. Although the sample size is relatively small, it is helpful to begin with a brief quantitative overview of the data, which allows for both a rough understanding of certain characteristics of the group as a whole, as well as a comparison of the children to their peers within the cohort of participants.

Other than the two boys (Kyle and Fred) who were carried over from the pilot study, the parents of all participating children provided the children's ages to the nearest month. The youngest child was Ally, a girl of four years and one month, and the oldest was George, a boy of five years and ten months.<sup>15</sup> The ages of the children were distributed fairly evenly across this span of one year and nine months.

The interviews also provided some information about the families' home towns<sup>16</sup> and visiting habits. Ten of the children lived less than 20 miles from the museum, but because the research was carried out during the school holidays, many had travelled from further afield, including Bolton, Harrogate, Neath, Aberdeen and Abu Dhabi. Seven of the children were regular visitors, eleven had been once or twice before, and fourteen were visiting for the first time.

Further analysis of the amount that the participants spoke and the number of photographs they took reveals aspects of the children's engagement with the methodology. This shows that on average, I spoke for 69% of the interviews, the children spoke for an average of 18%, and other family members for the remaining 12%. The range of children's involvement in the conversation varied from 3% for Ally (4) and Rhys (4) to 44% for Josh (5) (see figure 15). Overall there is a very weak positive correlation between the ages of the children and the amount that they spoke (see figure 16). However, this correlation is actually only the case for the boys, and is accounted for by the fact that half of the five-year-old boys (Kyle, Amar, Oscar and Josh) were noticeably more verbose than any of the other children.

The number of photographs taken by the children ranged from 7 to 219, giving a mean number of 49.9. However, this average reflects the fact that a small number of children took a very large number of photographs, and the median is actually 35.5, with most children taking between 20 and 50 pictures. While there is a huge range in the

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<sup>15</sup> Where relevant, children's ages will be given in parentheses after their names.

<sup>16</sup> For reasons of confidentiality, this information is not included with the rest of the information about participants.

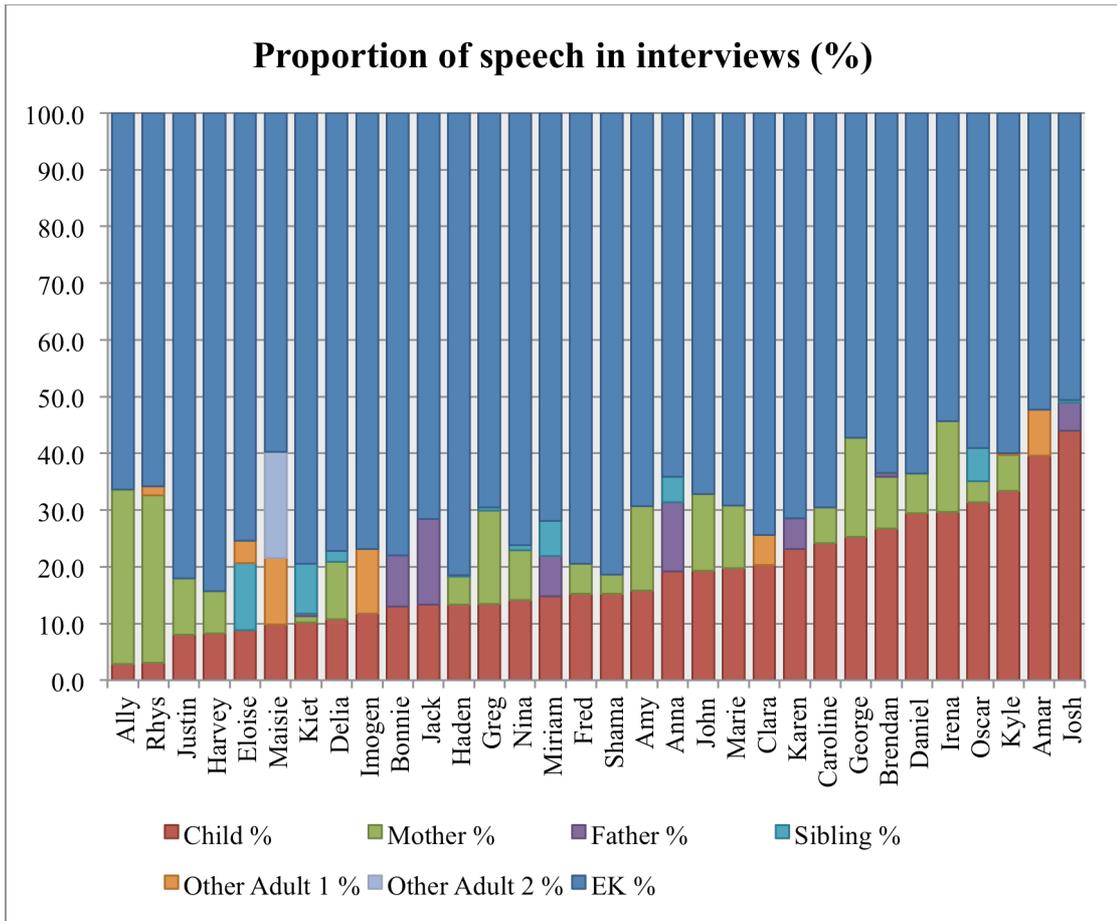


Figure 15.

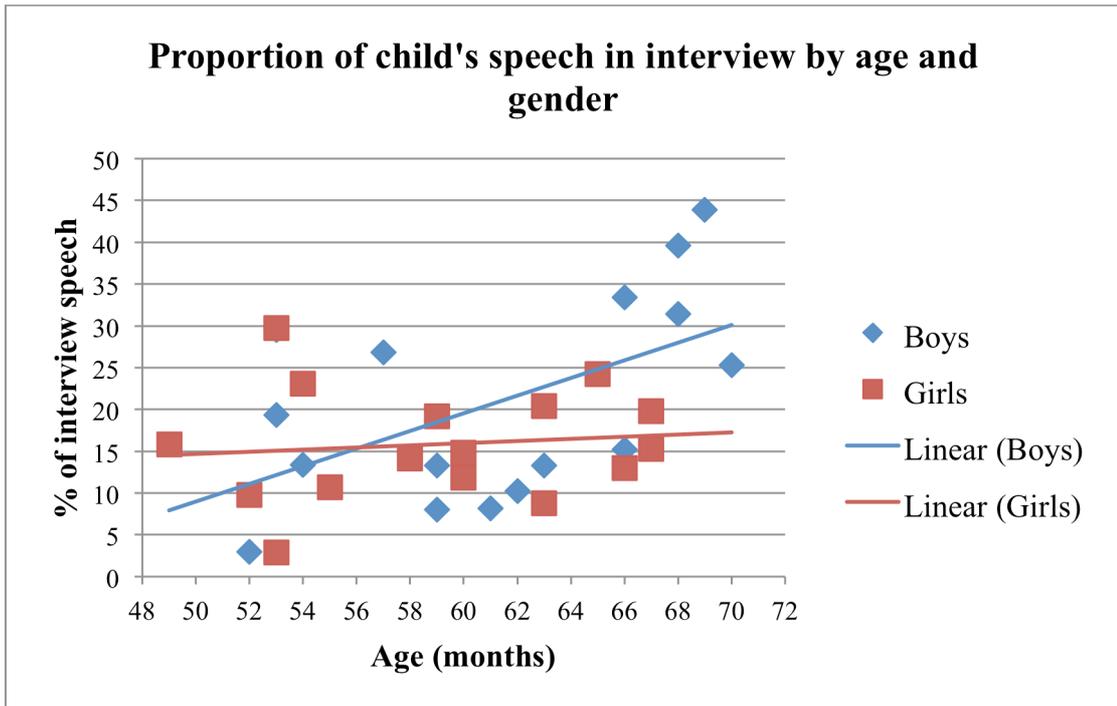


Figure 16.

number of photographs taken, there does not appear to be any correlation between this and the children's age or gender (see figure 17). There is also no correlation between the age and gender of the children and the *rate* at which they took photographs (photographs taken per minute: the number of photographs taken, divided by the visit length).

While the data shows some weak correlations by age and gender, which are potentially worthy of further study, it also confirms the striking individuality of the children who took part. Differences in interests, knowledge, imagination, curiosity and sociability do not generally appear within this small group to be linked to age or gender. It is these factors, and this individuality that will continue to be explored within the following chapters.

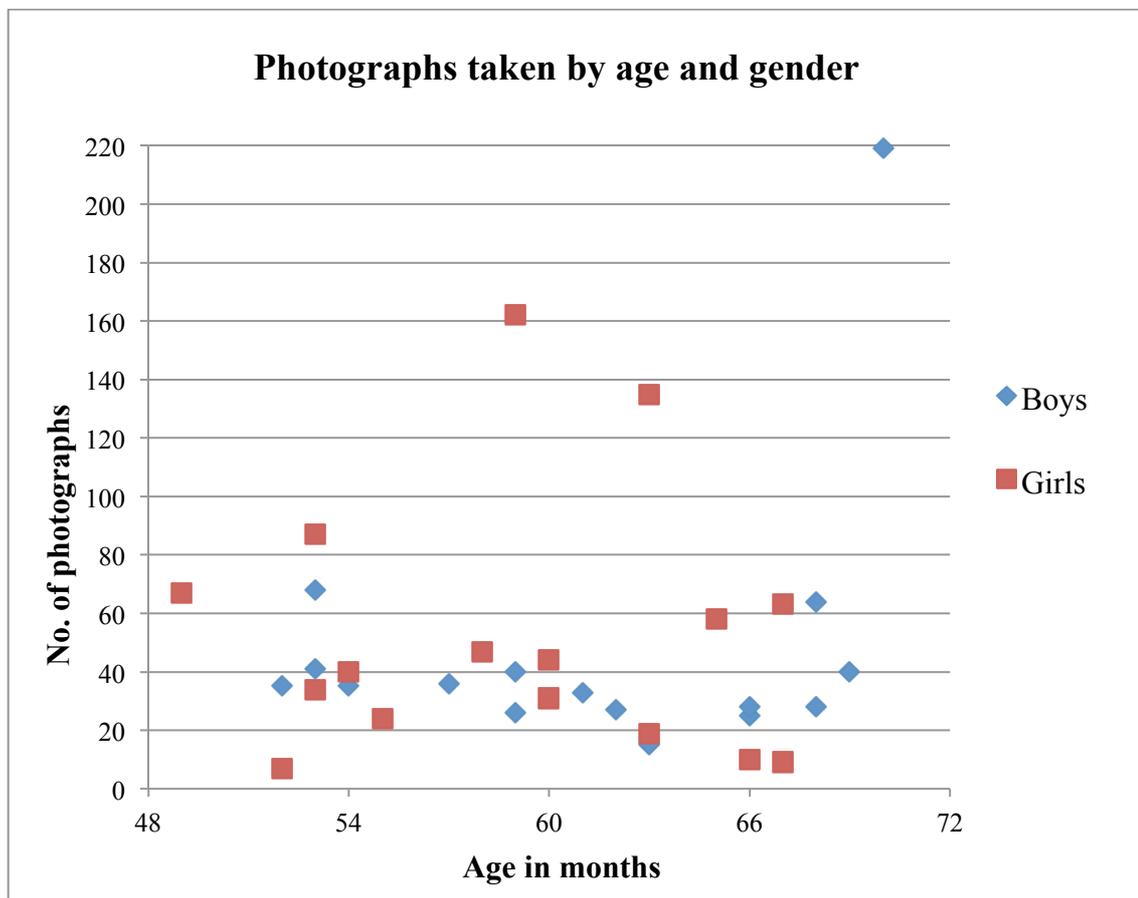


Figure 17.

## Chapter 6. Navigating and negotiating

As children enter the museum, they begin a process of understanding, managing, negotiating and navigating the situation in which they find themselves. Certain aspects of the museum situation may be familiar to the children — in particular, they are likely to know most, if not all, of the immediate social group with whom they are visiting. They may have visited this or other museums before, or museums may be an unfamiliar type of place for them. It is not just the physical aspects of the museum that the children must navigate, but also the social: the unspoken (and sometimes spoken) rules of being in a museum, and the ways in which family dynamics may change within this setting. Other family members (especially, but not only, parents) are also having to manage aspects of the child's experience: their energy, excitement, interest, tiredness, frustration or boredom. These processes of navigating and negotiating the physical and social settings continue throughout the visit, changing as the child becomes more familiar with the space, as their mood changes, and through fluctuations in everyday social experience.

Small, taken-for-granted differences in children's responses to the physical and social setting have important impacts upon the ways in which they respond to the museum collections and exhibitions. It could also be argued that the very mundanity of these navigations and negotiations means that researchers and museum professionals, who often focus in on visitor responses to exciting or impressive exhibits, tend to overlook this significant aspect of children's museum visit.

### ***6.1 Navigating the physical***

It has long been accepted that visitors of all ages need to orient themselves before they are able to settle into their museum experience (Falk 1991). Because the interviews with the children were carried out at the end of their visit, and because they were not tracked during the visit, it is not possible to *directly* see how these particular children went about navigating the physical space of the museum. There are, however, a number of clues from the photographs and the interviews — including comments from the parents,

and also evidence from the subsequent observations of other visitors, about the ways in which children were driven to get to know and get around the whole space of the museum.

### *6.1.1 Areas visited*

Figure 18 is a floor plan of the museum (lower and upper floors), showing the positions of all the identifiable photographs taken by the children, with each child's photographs coded in a different colour.<sup>17</sup> This reveals areas that were photographed by a large number of children (with clusters of many different coloured dots), those that were heavily photographed by some children but not others (with clusters of dots in a limited range of colours), and those that were photographed very little, if at all. So, for example, the map shows that the two hexagonal tables of handling objects (marked 'A') were photographed by very many of the children, with an analysis of the photographs confirming that 22 of the children took between them 106 photographs of objects on these tables. In contrast, a short stretch of the invertebrate cases (marked 'B') was heavily photographed, but a disproportionate 21 of these 22 photographs were by a single child, Eloise.

The museum can be roughly divided into three areas: the main central area, the downstairs outer area, and the upstairs balcony; and the distribution of photographs on the map clearly suggests that some areas were more significant to the children than others. Of course, the data can only show whether a child took photographs in a particular area, and not whether they went to an area but didn't take any pictures. However, the number of photographs taken in different areas suggests that some of these areas were much more appealing to the children than others (assuming that children generally take more photographs of the things that interest them the most).

Figure 19 shows, in blue, the number of children who took photographs in the three main areas of the museum, and, in red, the average number of photographs that each child took in those areas. This chart shows that the central area was the most visited, with all children spending time here (as would be expected, as this is the area immediately visible as one enters the museum), and most children taking most of their

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<sup>17</sup> This somewhat complex infographic map is intended to suggest the patterns of photography for the entire group of children, rather than to allow an easy identification of individual children's movements.

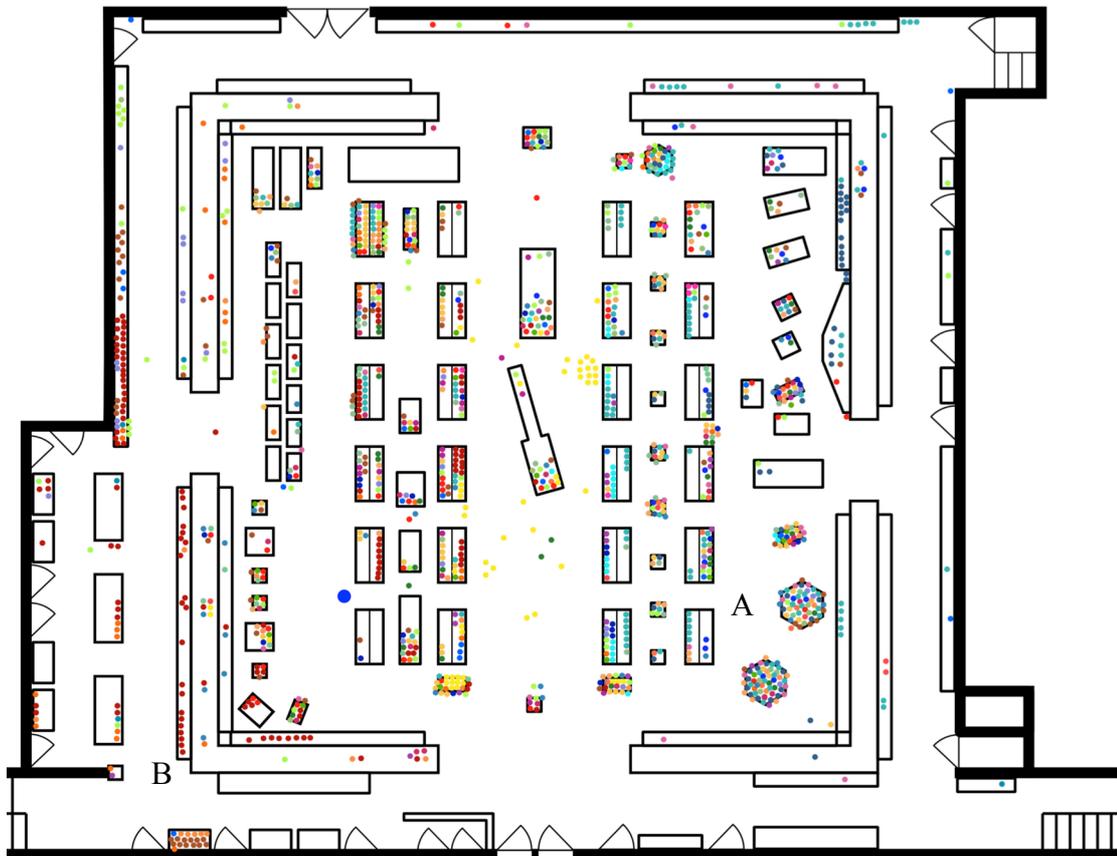
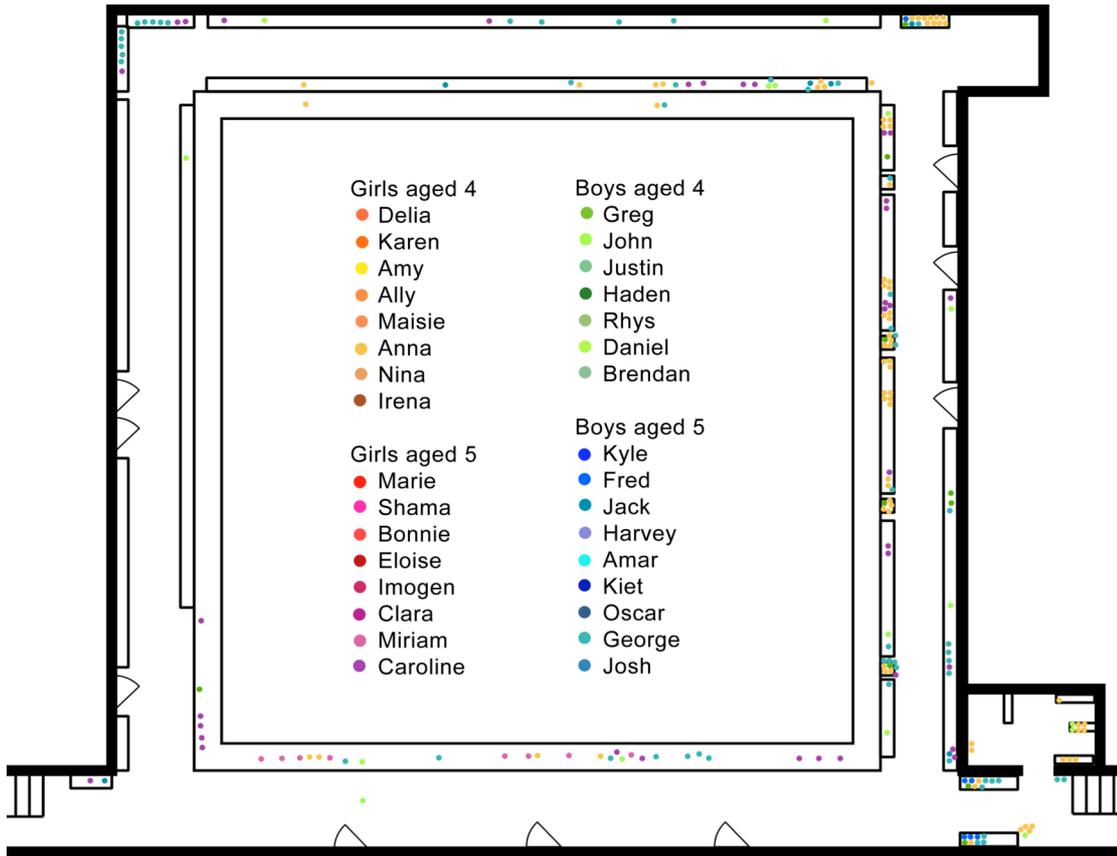


Figure 18. Location of children's photographs (large blue spot = interview table)

photographs here (average 37.8 photographs per child, 75.6% of the total). This is not surprising, as it is the largest area, containing the main displays. It is more interesting to compare the upstairs galleries with the outer downstairs galleries, which have almost identical floor space. Although fewer children went upstairs, this area stimulated those children to take more than twice as many photographs per head as the outer downstairs area. The eight children who went upstairs took between them 210 photographs (average 26.3 per child who visited this area), compared to 14 children visiting the outer downstairs area, who took between them 177 photographs (average 12.6 per child who visited this area), a third of which (n=63) were taken by one child (Eloise).

It is also interesting to note that the children's patterns of visiting these areas differed according to whether they had been to the museum before. Of the participating

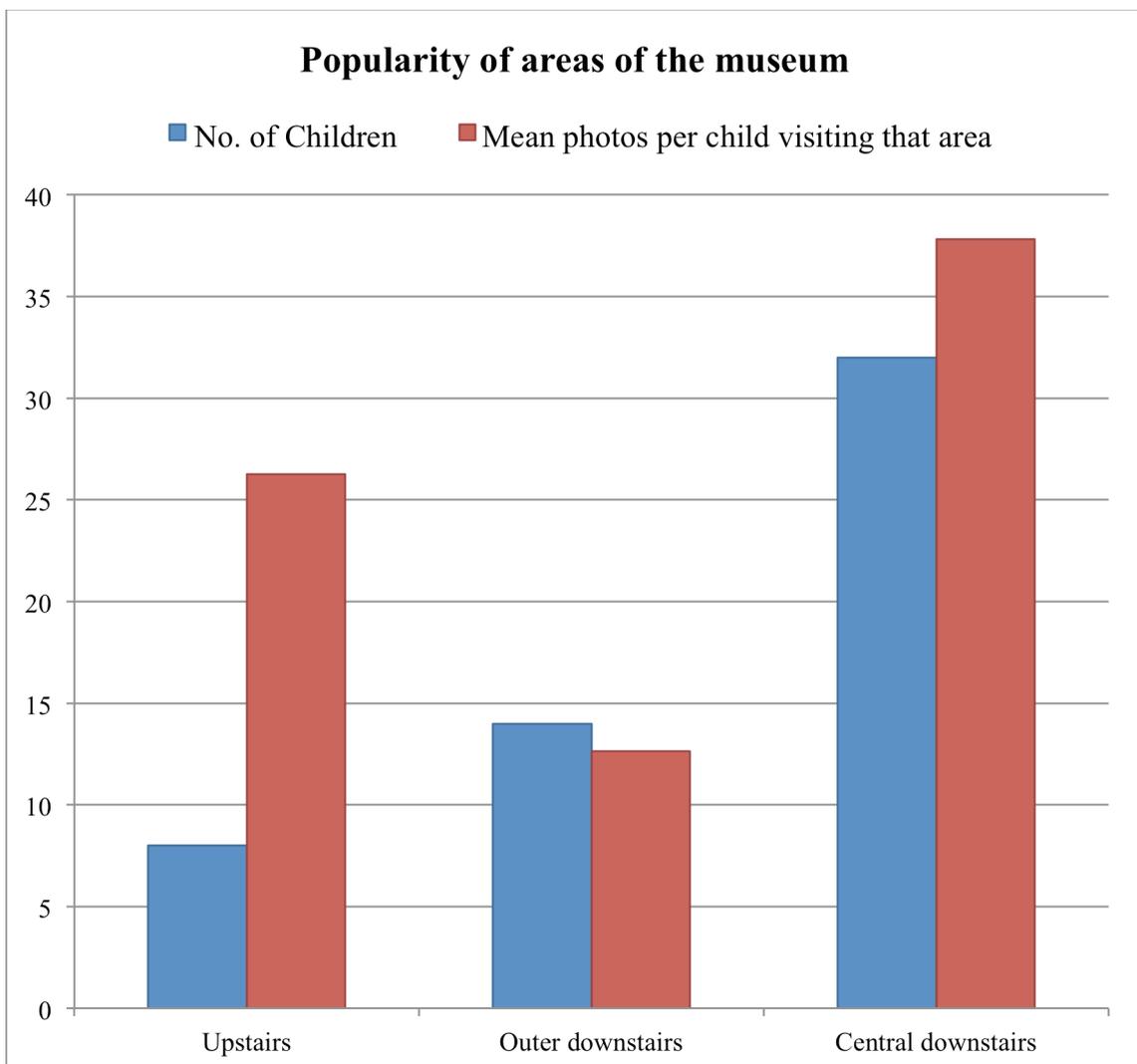


Figure 19.

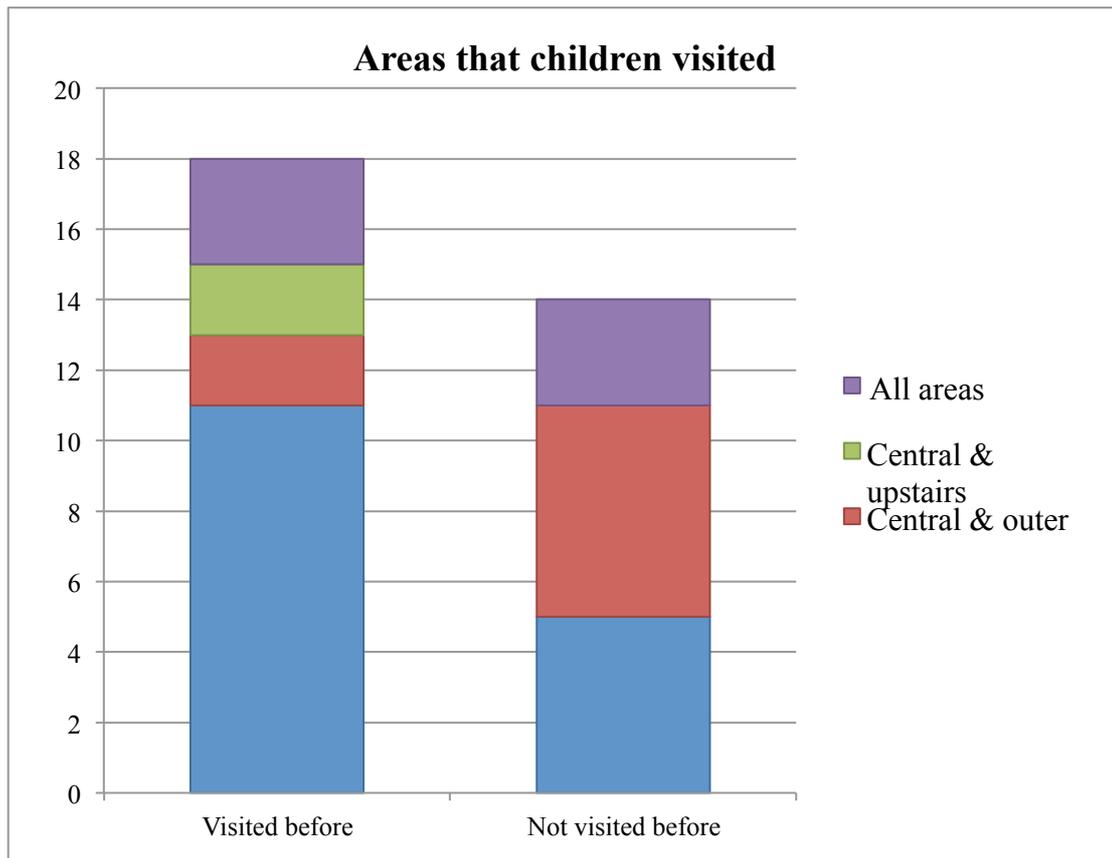


Figure 20.

children, 18 had visited this museum at least once before, and 14 had not. It might be expected that children who had already been to the museum would be more likely to know the different areas, and so more likely to venture beyond the central area. However figure 20 shows that previous visitors were actually more likely to stay in the central area (11 of the 18 children, 61%), compared to 36% of children who had not been before. Children who hadn't visited before were most likely to visit both the central and outer downstairs area (43%), but unlikely to take many photographs in the outer area. This suggests that children (and their families) who were visiting the museum for the first time were experiencing a greater drive to explore, but finding less in the outer downstairs area that was of interest to them compared to other areas. Children who had visited before were somewhat more likely to spend time upstairs than children who had not been before, which suggests that the upstairs area is not always discovered by first-time visitors. Indeed, during Harvey's interview, when asked if the family had been upstairs, his mother said 'I didn't know there was an upstairs'.

### *6.1.2 Strategies for exploring*

This pattern corresponds with findings from other researchers showing visitors' strategies for exploring the physical space of the museum. Falk (1991) found that families who had not visited a museum were more likely to want to see the whole of the museum than those who had visited before, while Rounds borrows the concept of 'foraging' from McManus (1994) to suggest that curiosity-driven visitors have optimal foraging strategies, in which '[t]he visitor's initial search strategy should be based on scanning widely throughout the museum, rather than focusing the search only in one area' (Rounds 2004, p.402). My own research suggests first time visitors may spend more time foraging in this way, while visitors with previous experience of the museum are able to focus their attention on areas that they know to be of interest to them.

Rounds's description of foraging behaviour goes on to suggest that visitors who are unfamiliar with the museum move with greater pace and energy and give individual exhibits a short amount of attention in order to take in as broad an overview of the area as possible. This energy seems to be particularly noticeable in younger visitors, with McManus (1994) suggesting that children often take the lead in family foraging behaviour, and Piscitelli observing young children being so energetic in a museum that they became sweaty with exertion (2001, p.226). Marcus et al. found that primary school children began a museum visit by:

... rushing very quickly from one area to the next, as if they wanted to take possession of the building and find out exactly what it had to offer. Once they had taken everything in, they sometimes re-visited parts of the building to have a closer look. (Marcus et al. 2009, p.14).

This high level of energy is alluded to in the interview with Justin (4), who's mother says that they 'zoomed around at great speed', suggesting that Justin set the pace for the family's visit.

Data from the observations give further evidence of children's energy compared to that of family members. In roughly a third of observations (27 of 90) the young children were more energetic or wanted to tackle the museum at a faster pace than other members of their group. In around two thirds of the observations (n=59) all members of the group had a similar energy or pace, and in only four observations did the children

have less energy or pace than the rest of the group. In terms of what this data says about the pace of visits more generally, each observation should not be taken to be representative of the whole of that group's visit, but rather a snapshot that, when used in conjunction with the other observations, gives an overview of the types, range and frequency of behaviours that are found in family visits to the museum. When read in this way, the observations suggest *not* that two thirds of families explore the museum at the same pace, while a third have more energetic children. Rather they suggest that *on average*, family groups will spend around a third of their time with the children being more energetic than the rest of the group.

While the foraging behaviour of adults might be assumed to be fairly systematic, the high levels of energy in young children can appear as a sort of undirected Brownian motion, or a simple desire to rush around a large space. But as Weier and Piscitelli (2003) argue, this rush of energy is not a simple matter of fun, but is part of a powerful impulse to discover what is in this new space, in which children are '[combing the museum] to locate information, explore ideas, gain knowledge and engage their curiosity about various topics' (Piscitelli et al. 2003, p.17). Worthington and Paull (1987) refer to this process in which children locate themselves in space and make discoveries as 'cognitive mapping'. During the interviews, it was clear that many of the children had developed very good cognitive maps of where they had been in the museum, and of the location of the objects that we were discussing. In the following segment, Daniel begins by talking about a row of ape skulls he saw, then goes on to describe the area where he saw them:

Daniel: They're all different because they keep on getting bigger and smaller.

Elee: Oh, they're different sizes, are they?

Daniel: Yeah.

Elee: Do you know why that is?

Daniel: Yeah, but it's a bit far from here.

Elee: Oh no, do you know *why* they're different sizes, not *where* they are? Although you could point to where they are. Can you remember?

Daniel: Uh, they're somewhere down there.

Elee: Ok.

Daniel: It's where that moose is trying to head-butt the light.

In this part of the interview, Daniel misheard my 'why' as a 'where' question, a mistake that also occurred in five other interviews,<sup>18</sup> which suggests that children had a strong concern with knowing the location of the things they had seen. More than half of the children interviewed (n=18) spontaneously demonstrated that they could remember the locations of certain objects, for example by gesturing in the right direction, describing the location, or describing the things around that object, as Daniel does above, when he gestures to the back of the museum and describes the moose head that was mounted close to a light fitting above the primate cases. Some of the children repeatedly told me about the location of objects throughout the interview (Eloise did this at least five times), and many of them purposefully looked around them as they spoke about the objects they had seen, again suggesting a powerful concern with their own mental map of the museum.

Children's mental maps are clearly capable of being long lasting, with some children also recalling the location of objects that they had seen on previous visits to the museum. Amy's mother told me:

There was something that Amy remembered from her previous visit. And we were all the way across the museum and she came back over to find it and it was the box that you put your hand in and feel.

Amy had only visited the museum once before, but was able to navigate her way back to something that had interested her on this previous visit. Other children gave tours to family members who had not been to the museum before, for example, Miriam, who was keen to show her father around, saying, 'I wanted to show him all the things that I like,' and so who took him straight to her favourite exhibit: the minerals glowing under ultra-violet light. Piscitelli and Anderson have previously commented upon young children's ability to form highly detailed and long-standing memories of both exhibits and architectural details within museums (2001, p.276). In Miriam's case this memory may have been particularly prompted by her desire to share her past experiences with her father.

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<sup>18</sup> Karen, John, Eloise, Harvey and Amar

### *6.1.3 Exploring through touch*

While the children's energetic navigation involves them getting to know the large-scale layout of the museum, they are also getting to know, and to feel comfortable with, the small-scale features of the museum. One of the most notable of children's small-scale explorations of the museum was in their touching of the handling collections. As described in section 4.2, the museum displays a number of handling objects, including individual geological specimens in the mineral aisle, a taxidermy cheetah and pony by the main entrance, and two tables of mixed specimens, including taxidermy, fossils and minerals. Rather than the collections being staffed, there are signs instructing visitors how to behave appropriately around these objects. Touch was discussed in most of the interviews, often when a child chose to look at a picture of a handling object and I asked them whether they had touched it. In addition, a number of the children's photographs capture other visitors in the act of touching objects.

The ways in which the children touched museum objects can be usefully divided between geological specimens and animal specimens. From the photographs especially, it is clear that visitors perceived the geological specimens as being sturdy and able to withstand fairly forceful handling. These pictures show visitors grasping, squeezing, poking and even seemingly attempting to lift a specimen off its plinth (figure 21).

In contrast, the children often seemed to touch animal specimens in a way that was social, rather than exploratory. They would stroke taxidermy animals as they might stroke a pet, focusing especially around the face and back. When I asked Imogen what she did when she saw the cheetah, she said 'I stroked it', and Justin gave the same response when I asked him what he did when he saw the horse, as did Eloise's older sister, Amber (see figure 22). During the observations, some children took this social response further, with one boy pretending to feed the fox, and a girl pretending to punch it (and being told off for doing so by her younger brother). The fact that the children touch the animals in this way suggests that they are imaginatively interacting with them as beings rather than as objects. Some children did touch the animals with one finger, as recommended by the signs. I asked Ally how she had touched the fox, and she showed me how she touched in this way. But it was also clear from her interview that she had touched the pony in a more social way, by stroking its mane.



*Figure 21. Oscar and George's photographs of people handling geology specimens.*



*Figure 22. Eloise and Miriam's photographs of people stroking animals.*

Generally, this suggests that children, and visitors more widely, take a ‘common sense’ approach to touching objects, in which they use their knowledge about an object, combined with visual clues, to work out how they should touch it. If it looks sturdy, as do the geological specimens, they are confident that they can be more forceful in their touch, while the animals tend to be touched gently, either because they are perceived to be delicate objects, or because this is how the child would touch a living animal.

Touch is a part of children’s physicality, but it should not be assumed that because a child is concerned with the physical aspects of the museum that he or she will be strongly motivated to explore through touch. So, for example, Marie (5) was very aware of the physical location of objects in the museum, expressed herself physically through bodily impersonations of animals, and was physically confident around me, leaning on me and even pretending to be a crocodile biting my arm! However, it became apparent that she had hardly touched any of the objects at all:

Elee: Did you touch anything in the museum? [...]

Marie: [...] I didn’t touch anything [...]

Elee: You didn’t touch anything? [...]

Marie: I actually did only touch one thing.

Elee: What was that?

Marie: The snake that little girl touched.

*[We realised that Marie was referring to the large handling ammonite, which she had photographed being touched by another girl]*

Elee: You did touch that did you?

Marie: Yeah, only, only I didn’t touch it like that, I only went like that.

Elee: You touched with one finger, not with your whole hand?

Marie: Yeah, very quickly, then I lifted it up.

Elee: So why did you touch that one?

Marie: Because, um, I wanted to feel what it was like.

That Marie is such a physical child, and yet touched only one museum object, suggests that children’s small-scale physicality within the museum is more complex than simply being a matter of whether or not they touch things. The observations reveal a greater variety of the children’s small-scale testing and claiming of the space around them: sitting on the floor, pulling themselves up onto display cases to get a better look, or

squeezing between columns and cases. The photographs too capture such behaviour in other visitors, for example showing them leaning on cases (figure 23). Touch is therefore only one of a large number of physical ways in which children interact with the objects and space of the museum. Even the seemingly passive act of looking can, in this way, be seen as physically active, involving pressing hands or noses on glass, squatting, pointing and leaning, and therefore fully integrated with the other senses (Dudley 2010, p.12). As Rees Leahy states:

The spectating body is alert to the requirements of the object on display; each exists in a relationship of dynamic symbiosis with each other, as well as with the space they occupy and everything within it... (Rees Leahy 2012, p.48)

The space in which the museum visit takes place does not only consist of the large scale layout of the museum building and the small scale interactions with its surface. Although this research does not follow up children's activities after their museum visit, some of the children and adults talked in their interviews about how they had prepared for or travelled to the museum. Greg's mother said that he and his brother had played with their dinosaur toys that morning in anticipation of their museum visit, while Anna, Amar, Brendan and Irena each talked about their journeys to the museum, by bus, train and taxi. Although the evidence of children's preparation for and journeys to the museum is limited, it does suggest that, for the children, their personal maps of the museum, their sense of the experience, and the world they have to navigate during that experience, will include associated activities outside of the four walls of the museum. Indeed, Fidler et al. similarly found that when they gave children cameras to record their museum visit, photographs were also taken of the journey to the museum (2011, p.41). An investigation of the place of the museum visit within broader lives or ecologies is beyond the scope of this project, and has been tackled by researchers such as Zapri (2007).



*Figure 23. Marie's photographs of people leaning on cases.*

## ***6.2 Negotiating the social***

As some of the examples above suggest, children's explorations and navigations of the physical space of the museum are very much carried out in association with the other members of their group. While the methodology used in this research project (unlike, for example, visitor tracking) does not reveal the visitors' behaviour moment-by-moment, the interviews do give family members' perspectives on how they went about influencing each other's interactions with the museum, and how the children attempted to assert themselves within the physical and social space. Combined with the observation data, this reveals something of the range of ways in which children's explorations and navigations of the museum are influenced by other people.

### *6.2.1 Independence and safety*

The patterns noted within the observations suggest that most children spend most of their visit in relatively close proximity to their families. However, given the energy described above, it is perhaps unsurprising that many children also break away from their family groups from time to time, even if the relative distance they travel is not far. Within the observed groups, children were seen to be moving away from the group in 59 of the 90 cases, or in just under two thirds of observations. However, this movement away from the family did not appear to be simply due to differences in energy, but also arose from a number of other factors, such as going to look at nearby things that were interesting (n. 21), wanting to find things to show the family (n. 11), being annoyed with members of the family (n. 8), or being left to their own devices while other members of the group gave each other attention (n. 5). In this way, independence could be social (e.g. finding things to show), non-social (e.g. curiosity about the museum objects), or even anti-social (avoiding family members).

What does seem to be apparent, from both the observations and the interviews, is that families were generally comfortable with children moving a short distance from the family group. There seemed to be an assumption that, as long as parents knew where their children were, the children could be considered safe within the museum setting, in spite of the busy holiday crowds. Take, for example, the latter part of observation 64, which focused on a family consisting of parents and a boy of around five years:

They [the family] move down to the end of the dinosaur area. The parents sit together on a chair — the man rubbing the woman's shoulders. The boy goes into the booth displaying ultra-violet glowing minerals. A few times his parents call him and he calls back to them from around the curtain. He stays in the booth while other people come and go, and is on his own in there for a while, making roaring sounds. His parents eventually join him and have a look, then they all move on. [Observation 64]

In this example, the parents are comfortable with not being able to see their child, and even with other people going in and out of the booth that he is in, as long as they maintain verbal contact. The safety that parents and children feel in this particular museum may also be explained by the relatively open layout of the aisles, so that it is generally easy for parents to see where their children are, even if they are not right next to them. It may be that in museums with poorer sight-lines, parents and children stay closer together.

Young children's patterns of independence in relation to their family most commonly consist either of moving backwards and forwards between the group and the exhibits (a pattern that Hackett (2012b) refers to as 'zigging and zooming'), or of moving ahead of the group, with the family following them. In both of these situations, children implicitly assume the freedom to follow their own interests and expend their energy, while their patterns of movement relative to their families ensure that they are almost always within sight of the adults. Within the data collected, it was very rare to have situations in which young children were out of sight of the adults of the group for more than a few seconds. In only two observations did lone children move so far from the group that they could not be seen. In one of these cases (observation 60) a very energetic boy was seen running around the museum, but he became upset and blamed his father for briefly losing him. In the second case (observation 67), the boy seemed to be asserting his independence and staying at a distance from the group, but when his grandmother called for him, he ran to her. A much more extensive survey would be needed to properly explore children's wandering behaviour, responses to being lost, and sense of safety in the museum, but the current survey suggests that in this museum children generally stay relatively close to their parents, but stray just enough to enjoy some independence, to move at a pace that suits them, and to be free to look at things that interest them personally. Other studies have suggested that both culture and the

physical nature of the museum play a part in families' concepts of child safety, so, for example, Tolmie et al. (2014), found that in very large museums in France and Greece, families were extremely concerned with not allowing their child to get lost.

In a small number of cases, young children are allowed to move away from their parents as long as they are accompanied by older children. Two of the boys interviewed, Kiet (5) and Harvey (5), spent at least some of their visit exploring the museum with older children: Kiet with his nine-year-old sister, and Harvey with eight-year-old friend Freya. There were also two observations which captured older children accompanying younger children out of sight of the adults, although in both cases this appeared to be for a short amount of time.

Museums also seem to be places in which the atmosphere of sociality can spill over into interactions with strangers, who are assumed to be friendly and trustworthy. As a result, I found that while carrying out observations, parents occasionally spoke to me, and that children showed an interest in the people around them, listening to their conversations and sometimes even initiating conversations with them. This behaviour suggests that families feel safe in the museum, and that even in a relatively busy space the adults generally trust the other museum visitors around their children. It is unsurprising that parents are keen to keep close contact with young children, but the fact that this contact can be verbal, that the children are free to wander amongst other visitors, and that older children can be allowed to take responsibility for younger children, suggests that parents do not perceive a high level of threat to their children, as might be expected in a busy public space with an open door.

### *6.2.2 Control and influence*

One feature of children's wandering behaviours is that adults generally maintain a degree of control over how far children stray. Within the observations, there are 11 examples of parents stopping children from moving away from them, and 10 cases in which parents are holding on to young children, which may in part be to stop them from wandering (as well as providing comfort and security). However, even where parents are in control of how far the children stray from them, children often maintain a degree of agency and control over other aspects of the visit, such as the pace and the focus. These variations in control can lead to significant differences in the experiences of the children as they and their families explore the museum.

While parents maintain the ultimate responsibility for the visit, and more or less control over the behaviour of their children, the children are often allowed to make decisions about what to look at and where to go. It has already been noted that children often took the lead, and that this was the case in 40% of the observations (n. 36). However, the other observations do not represent parents taking the lead, but rather, the majority of the remaining 60% of observations were either of groups looking at things together, or of groups who were looking at things independently of each other, and not attempting to control what the others looked at. Only rarely did parents directly take the lead. Similarly, Dooley and Welch (2014) found that both children and adults were seen to try to refocus each other's attention in a museum, but this was four times more common in children than in adults, who often achieved this by simply walking to something new.

Even in cases where parents attempted to direct the children's attention, the child often had the choice of whether or not to attend to their parent. A good example of this is observation 86, of a father with his son of around four years of age, holding hands and walking along the parade of mammal skeletons:

... The man points up at the giraffe and says "Do you know what that is?", but the boy is looking in a low case behind. He sees a bat skeleton and playfully screams and grabs his father. Then looks up at the giraffe and screams again. The man says "It's a giraffe". They walk along the parade, still holding hands. The man names all the animals as they walk along, but the boy is looking in the low cases. As they pass the coral, the boy says "Brain!". The man pauses briefly and then continues walking. [Observation 86]

The father is talking about the large mammals, which are on the pair's left-hand-side, but the boy is looking into the cases to his right, ignoring what his father is saying. This hints at multiple levels of control in which the parent has overall control over which areas of the museum they visit, but the child is still able to focus his personal attention on something of his own choosing.

The range of levels of child and parental control were clear during the interviews, with some conversations being more controlled by the adults (although this was a minority), and others by the children. Ally (4) was quite reticent during the interview (she spoke only 56 words during her 11 minute interview), but was also to some extent

prevented from expressing herself by her mother, as in the section below, in which it appears that Ally wants to say something, but is twice directed away from her own train of thought by her mother:

- Elee: Is there anything else you can tell me about this pony?  
Ally: Yeah.  
Elee: What else can you tell me?  
Mother: Say s... small.  
Ally: Um, small.  
Mother: Small.  
Elee: It was small? [...] Ok, do you want to tell me anything else about the pony?  
Ally: Yeah.  
Elee: What else do you want to tell me?  
Ally: Uh...  
Mother: What colour is it?  
Ally: I don't know.  
Mother: Course you do. Brown.  
Ally: Brown.  
Mother: Yeah.

In stark contrast to this was the extremely confident Clara (5), who spent a significant part of the interview looking through and talking about a dinosaur book that she had brought with her. My attempts to re-direct her attention to her photographs were largely unsuccessful, and almost a half of the interview was controlled by Clara in this way, until her grandmother confiscated the book. While neither Ally's nor Clara's interview gives direct evidence of the girls' experiences as they visited, they are strongly suggestive of the importance of the child's confidence the power balance in the relationships between the children and adults, and the types of impact that these may have had on the visit.

Differing levels of control also exist between children and their siblings (and other children). One particularly striking example is that of four-year-old Delia, visiting the museum with her older brother, Otto, who was around eight years old. During the interview, it became apparent that Otto had strongly influenced the photographs that

Delia had chosen to take, and she told me: ‘I take the picture of what Otto told me to take a picture of.’ As the interview continued, Delia’s responses to my questions focused in part on whether each picture was one that Otto had directed her to take or one that she had chosen to take herself. Occasionally Otto, who was nearby, would approach us and interject to tell me that he had instructed Delia to take a particular picture. Their mother finally explained that ‘[h]e was calling Delia come and see this, come and see this, and she was running off with the camera...’ and, when I asked whether the visit had been mostly led by Otto, she explained that Delia ‘just wants to follow him around.’

### *6.2.3 Museum social rules*

The control that parents and older siblings have over the young children’s visits is not simply a matter of directing where they go or what they photograph. As demonstrated above, young children do often have a significant amount of influence over the pace and focus of the family’s time in the museum. However, what they may have to a lesser extent is an understanding of the expected modes of behaviour specific to museums, and it is here that older group members can exert significant influence. The social roles that the children are navigating and negotiating are of being both a family member and a museum visitor. And while they will be experienced in negotiating the social world of the family, their expertise in negotiating the social world of museums may be significantly lower.

Although the data does not capture the moment-by-moment behaviour of families during an entire visit, the interviews and observations do provide some examples of children being navigated through their role as a museum visitor. Sometimes this is achieved through a gentle guiding and modelling of appropriate behaviour by the parents or siblings, and sometimes by more overt means of controlling behaviour (as noted by Tolmie et al. 2014; Briseño-Garzón & Anderson 2012).

Amongst the interview participants, some children had clearly spent their visit in very close proximity to their parents. Jack (5) and his father spent almost the whole of their visit focusing on the same things, and Jack’s father was often able to describe the situations in which Jack’s photographs had been taken, and the conversations they had been having about the objects in question. This closeness was particularly revealed when Jack chose, during the interview, to talk about a photograph of a seed pod, which

his father had *not* been aware of. His father was surprised by the picture, saying ‘I didn’t know he’d taken a photo of that one’, and hence implying that most of the rest of the visit had been in close collaboration.

In cases such as Jack’s, and in many of the observations, families spent much of their time close together, pointing out different objects to each other, and talking about what they could see. During the interview with Anna (4), she twice repeated comments from her father and older sister that she liked the whole museum, suggesting that she was taking cues from them about how to express her opinion of the museum, and modelling her role as interviewee on their behaviour.

Within the observation data, there are a number of cases of parents controlling children’s behaviour more overtly. This was most obvious in cases of children touching museum objects. Andrew Alvarez (quoted in Adams & Luke 2005, p.8) observed that families were often confused and hesitant about touching objects in a museum, with children being keen to touch immediately, while parents often tried to stop their children from touching or waited for cues from other visitors around them. Of the 90 observations, 38 involved children purposefully touching either collections (n. 31), or parts of the fixtures and fittings of the museum (n. 7). Of these interactions, 11 involved parents attempting to control (stop or modify) this behaviour, and 12 involved discussions around what could or couldn’t be touched. The observations also showed that children touched things much more than their parents did, a pattern that has been found in earlier visitor studies (Koran et al. 1988). This suggests that children had a comparatively strong drive to touch things, which was sometimes being curtailed or modified by their parents’ beliefs about appropriate museum behaviour (although, conversely, observation 89 involved a child reading a sign and then telling her mother not to touch something!). The data can not, however, reveal whether the relative infrequency of adults touching objects was because they believed that this was inappropriate behaviour or because they simply did not want to.

#### *6.2.4 Conflict*

The above suggests that children’s behaviour can be either condoned, subtly modified, or controlled by those around them. As might be expected, this can lead to situations in which children and their families want different things from the museum. Anderson et al. (2008), exploring situations of friction between young children and adults in

museum learning situations, frame these social negotiations in terms of competing agendas, in particular the agendas of content (the focus of conversation), mission (the path taken), and time spent in areas of the museum. Anderson et al.'s concept of agendas suggests that children have overarching and intentional goals during their visit, or at least during parts of their visit. The data from the present study, however, suggest that many of the moments of conflict that arise are on a much smaller scale than this, and instead consist of minor power struggles, or micro-conflicts, caused by moment-by-moment fluctuations in the compatibility of the desires of children and their families, which can have a profound effect on their experiences of the museum.

A number of cases of minor conflict arose, both in the interviews and in the observations, which involved, for example, siblings becoming annoyed with each other, or in which the adults had to take action to avoid conflict. One potential source of conflict was the presence of the camera, which was always loaned to a specific child within the family. There was some evidence of families finding ways to avoid this causing conflicts between siblings. For Imogen's family, her grandfather explained, the solution was to split the group, so that she, accompanied by her grandfather, could take photographs, while her older brother, cousin and father separated from them. Anna's father chose a different solution, instead allowing Anna's sister to use the camera as well.

The observations included eleven examples of minor conflict between family members. In most cases, these power battles were not simply a matter of over-arching competing agendas, but arose because children were testing and negotiating the boundaries of their behaviour, as in the following two examples:

The younger boy (~2) is leading, and points up at the tyrannosaurus skeleton. The father and older boy (~5) follow, and then start talking about the exhibits behind the tyrannosaurus. The younger boy goes to the iguanodon skeleton and grabs and shakes the tail. The man and older boy catch up, and the older boy sees a stick that has been left on the iguanodon base. The boys then argue over the stick, the younger boy hits his brother, and their father tells them off. Then the man and the older boy look in a case of fossils and the younger boy sits on his father's feet.  
[Observation 07]

The family are by the primate cases. The mother and father are staying together, the girl (~8) is mostly staying with them, and they are talking together about the objects in the cases. The boy (~4) is walking ahead, fiddling with the locks on the cases, occasionally stopping to look in. He is fussing, saying “I wanna go upstairs”. His mother says they are trying to look at everything and he will have to wait. He calls to them to come and look at something, but they do not come. He is fussing and they are ignoring him. [Observation 31]

In their ethnographic study of families in two large European museums, Tolmie et al. found numerous examples of this type of conflict, particularly in families with young children. They suggest that there appears to be a ‘widespread, important, and relatively undiscussed tension in group visits to public spaces such as museums’ and that in the case of families this largely arises from a strong need to keep the group together, in spite of differences in interests (Tolmie et al. 2014, p.1058). The examples from my own observations suggest that this museum-specific type of conflict is also combined with everyday interactions and irritations, which can also have an important effect on the mood of the visit.

However, the role of conflict should not be stressed to the detriment of mutual enjoyment, fun and pleasure. As well as constraining children’s behaviour, parents also encouraged more playful engagement with the museum, for example in these photographs by Kiet, in which his father and sister are pretending to be chased and eaten by dinosaurs (figure 24), or Oscar’s father, who shook the tyrannosaurus head because, as Oscar explained, he wants ‘people to think it’s real.’ In this latter case, Oscar was aware that his father was pushing the boundaries of acceptable museum behaviour, as he told me ‘[s]ometimes my daddy is a bit naughty, because you’re not allowed to shake it, but my daddy does.’

While Zapri criticises the assumption of children as ‘happy and enthusiastic museum visitors’ (2004, p.66), it did appear to be the case within this research that most children experienced most of their museum visit in general in a positive light. Only a minority of the observations show children who are not enjoying themselves, and the interviews too very much suggest that the children were happy to be in the museum, had enjoyed the company of their families while they were there, had delighted in looking at and interacting with the objects that were around them, and were even having fun taking part in the research. Some of the children were so excited during the interviews that



*Figure 24. Kiet's photographs of his family being eaten by dinosaurs.*

they bounced in their seats as they spoke to me. This level of enjoyment should not come as a surprise, as families visit museums through choice, and would be less likely to do so if they did not expect to enjoy themselves. Likewise, museums have increasingly begun to take account of their visitors, and Oxford University Museum of Natural History is particularly renowned for this, having won an award for ‘family friendliness’.<sup>19</sup>

### ***6.3 Chapter conclusion***

Children’s physical navigations of the museum occur on large and small scales, as they get to know both the wider terrain of the museum space and the specific features of the museum objects. The children’s explorations of the museum varied depending on whether they had visited previously, with first-time visitors more likely to go to the outer downstairs area, and regular visitors more likely to know about and therefore visit the upstairs area. The children were generally more energetic than adults in their movement around the museum, but this energy was accompanied by an effective ‘cognitive mapping’ of the space, which allowed the children to recall exactly where they had seen various objects. The children were also drawn to explore the museum through touch, however this was only one of a repertoire of physically active small-scale engagements, that also included moving, leaning, pointing, stretching and squatting as they looked at objects in the museum.

The children’s navigation of the physical space was accompanied by navigations and negotiations of the social contexts of their museum visits. The museum appeared to be perceived as a safe space, and children often wandered short distances from their group, although almost always within eyesight of the adults. Children often had a high level of influence over their group, taking the lead as the group moved around the space. Even in cases where adults lead the way, children often exerted ultimate control over the focus of their own attention. Adult control was most notable in ensuring that the children behaved appropriately within the museum space, and in particular in curtailing the degree to which children touched museum objects. Groups often showed signs of small scale conflicts between children and adults or other children. However, within this family-visiting context these conflicts were more on the level of minor

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<sup>19</sup> Winner of the Guardian Family Friendly Museum Award 2005, administered by the charity Kids in Museums.

irritations than more fundamental conflicts in visit agendas. Generally the families appeared to find things within the museum and each other to give an overall sense of delight in the experience.

## Chapter 7. Lighting up

Having discussed the broader spatial and social navigations in chapter six, this next chapter focuses in on children's specific responses to the museum's content. Each child experiences the museum and its objects differently, and one can imagine that each child is visiting a different museum, in which certain objects are brightly lit and others languish in the shadows. For one child, dinosaurs may stand out as the most noticeable things in the room, while for another child the dinosaurs are almost invisible, and instead the museum consists of favourite mammals and birds, or of sparkling minerals. Jay Rounds discusses the 'rugged terrain' of the museum:

The foraging territory facing the curiosity-driven museum visitor can be depicted as a three-dimensional landscape. The first two dimensions define a plane, across which are distributed the exhibit elements available for viewing. The vertical dimension maps the interest value that each exhibit offers to this visitor; the higher the peak, the greater the interest. (Rounds 2004, p.379).

I will combine this metaphor with that of spotlights (which Hooper-Greenhill 2007, p.38 borrows from Claxton 2001, p.75), so that instead of seeing the museum as a landscape of peaks and valleys, it can be seen as a tapestry of light and shadow. The metaphor of spotlights can be usefully extended as a way of thinking about the aspects of the museum that are salient to the children (that light up for them), some of the reasons for this salience (the source of the light) and the depth of the interest in the museum and its objects (the intensity of the light).

### ***7.1 Patterns of attention***

The data from the interviews and photographs reveal the various aspects of the museum that children were drawn to, including not only collections and displays, but also other people and parts of the building. Using the photographs to reveal children's interests is something of a blunt tool; as discussed in section 5.1.3, the children had different and changing thresholds for what made something worth photographing. It may also be that

some things were interesting to them but not perceived as being photogenic, and that the location and frequency of their photographs was influenced by other members of their family deciding which parts of the museum to visit. While it is not possible to know everything that attracted the children's attention, the photographs do give a good idea of the types of things that they noticed, as the children clearly must have noticed something to be able to photograph it (even if they only noticed that thing while they were in the act of photographing it). This is essentially measuring what Falk and Dierking, borrowing from Lakota,<sup>20</sup> call the 'attracting power' of the exhibits, rather than their 'holding power' (Dierking & Falk 1994, p.57).

There are a number of ways of measuring the popularity of different objects within the museum: by looking at which specific points in the museum were most heavily photographed, by looking at the types of objects that were photographed most often, and by looking at the subjects of the photographs that were mentioned most frequently during the interviews. Table 8 below includes all the specific objects or cases which were photographed by 11 or more children (i.e. more than a third of the total group). Free-standing objects were counted on their own, while, for practical purposes, all photographs of one case were counted together, as were the handling tables — this is partly because it can be hard to tell which of the numerous small objects in these displays is most attractive, but also because it may actually be the combination of objects which makes the display attractive. The photographs of the 15 objects or displays in table 8 account for just over a quarter of the pictures taken.

It is difficult to make direct comparisons from this list, which includes large individual objects and collections of smaller objects. These 'superstar' objects do, however, reveal something about the sorts of things that were generally attractive to the children. The objects are almost all one or more of the following: handling collections, dinosaurs, predatory animals, large animals, familiar taxidermy birds and mammals, and visually attractive minerals.

A second list shows the *types* of specimen that were photographed by at least a third of the children, so that objects of a similar type are counted together, even if they are located in different parts of the museum. Table 9 shows how many photographs of a type of specimen the children took, and how many examples of that type of specimen are in the museum. This list broadly reflects the previous list. The most popular types of

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<sup>20</sup> Unpublished manuscript by R.A. Lakota (1975) 'The National Museum of Natural History as a Behavioural Environment'.

*Table 8. Popularity of specific objects or displays*

<b>Object/case</b>	<b>Number of photos</b>	<b>Number of children</b>
Handling tables	106	22
Tyrannosaurus skeleton	31	22
Handling cheetah	23	18
Tyrannosaurus head	22	17
Utahraptor	20	17
Iguanodon skeleton	21	16
UV mineral booth	31	14
Pleisiosaur case	18	14
Laurasia case	28	13
Handling pony	26	13
Large taxidermy crocodile	16	13
Eustreptospondylus case	17	12
Tuna	16	12
Spider crab	14	12
Footprint case	14	11
<b>Total</b>		<b>403</b>

specimen are prehistoric reptiles (which make up four of the top five specimens on the list), familiar mammals and birds (e.g. the fox, horse and owl), predators, large animals (including animals that are relatively large compared to others of their type, such as the tuna or spider crab), and visually attractive minerals and fossils (including the UV minerals, pyrite, and ammonites). The appeal of large objects to young children has been noted by Anderson et al. (2002).

It should not be surprising that dinosaurs score so highly here. The museum has significant prehistoric collections, and dinosaur models and skeletons are some of the most visually arresting of the objects on display. Children's intense fascination with dinosaurs in other museums has been noted by many researchers (e.g. Palmquist & Crowley 2007; Anderson et al. 2008). In addition, it should be expected that individual dinosaurs would be photographed more than individual mammals, because they are larger, and tend to stand alone, rather than being located amongst other specimens.

*Table 9. Popularity of specific types of specimen*

<b>Object type</b>	<b>No. of displays</b>	<b>Photographs</b>	<b>No. of children</b>
Tyrannosaurus	3	66	28
Iguanodon	3	40	20
Cheetah	1	23	18
Utahraptor	1	20	17
Plesiosaur	2	27	16
Crocodile	4	34	15
Eggs	8	30	15
Horse	2	30	15
Ammonite	10	42	14
UV minerals	1	31	14
Owl	3	18	14
Pyrite	2	17	14
Eustreptospondylus	1	17	12
Tuna	1	16	12
Footprint	2	15	12
Spider crab	1	14	12
Rabbit	3	14	11
Pheasant	1	14	11
Fox	1	14	11
Pufferfish	2	13	11
Ostrich	1	11	11

However, some objects are displayed no more prominently than others, but are photographed much more, suggesting their particular salience for the children. So, for example, of the nine handling objects positioned evenly along the centre of the mineral aisle, the sparkly pyrite was disproportionately popular, with almost double the average number of photographs for these objects (13, compared to an average of 7, see figure 25). Other objects that appear to be particularly popular, in spite of not being displayed any more prominently than other nearby objects, include eggs, ammonites, and owls.



Figure 25. Bonnie's photograph of pyrite.

It should therefore be noted that this analysis of the popularity of photograph subjects is not precise, as the difference in the prominence of displays makes direct comparisons difficult. A thorough, quantitative analysis of the appeal of each type of object would need to look at both their quantity and their prominence in the museum, thus taking account of the opportunities that children had to photograph each of them. In addition, the names used in tagging specimens have had to be fluid, sometimes using everyday overarching categories (e.g. beetle, eggs), sometimes using generic species names (e.g. utahraptor, spider crab). The names have been chosen for pragmatic reasons, to reflect the responses of the visitors to the objects they encounter, and other naming schemes and category groupings might well produce different results.

A third list (table 10) shows the subjects of the photographs that were discussed in the interviews, thus hinting at which types of object, out of all of those photographed, seemed to be particularly meaningful to the children. As with previous parts of the analysis, this is a somewhat blunt tool, as it only shows *whether* photographs were discussed in the interviews, and not to what extent. While children were encouraged to choose which photographs to talk about in the interviews, some photographs were

Table 10. Subjects of photographs discussed in the interviews

Object type	Category	Photographs	Children
Tyrannosaurus	Prehistoric reptile	17	13
Crocodile	Reptile	13	10
Pyrite	Mineral	10	10
UV rocks	Mineral	12	9
Cheetah	Mammal	8	8
Eggs	Misc.	8	7
Owl	Bird	7	6
Horse	Mammal	6	6
Utahraptor	Prehistoric reptile	6	5
Plesiosaur	Prehistoric reptile	6	5
Eustreptospondylus	Prehistoric reptile	5	5
Snake	Reptile	7	4
Ammonite	Fossil	4	4
Baby allosaur	Prehistoric reptile	4	4
Elephant	Mammal	4	4
Hare	Mammal	4	4
Human skeleton/skull	Human	4	4
Penguin	Bird	4	4
Pterosaur	Prehistoric reptile	4	4
Pufferfish	Fish	4	4

chosen by myself or their parents, and some were likely to have been chosen because they were displayed near the last photograph to have been viewed. In addition, some objects may appear on the list because they appear in photographs that were discussed, but without these specific objects having been talked about, particularly if they are displayed in a densely packed case or on the handling tables.

This list starts to hint at the strength of the ‘lighting up’ of objects within the museum. There are objects on this list that were not regularly photographed but that, once noticed by the children, seemed to be relatively meaningful. Specimens that appear on this list, but that are *not* on previous lists of heavily photographed objects, include snakes, human skeletons, and penguins. The iguanodon, which was a popular subject

for photographs, was barely discussed at all during the interviews, and so does not appear on this list. And again, the list shows the popularity of the large prehistoric reptiles, the attractive fossils and minerals, the familiar birds and mammals, and of predators.

It is not just the types of objects, but also the properties of objects that can be of particular salience to the children. A number of studies have shown that children are attracted to large objects in museums (e.g. Piscitelli & Anderson 2001), and a similar pattern has been seen in this research, in which large size was a common reason given by children for liking certain objects. This included relative size, so for example John says of a large ammonite, ‘probably that’s the biggest fossil on Earth’. The children were also very drawn to objects that were brightly coloured, patterned, sparkly or shiny. Some of the reasons behind these patterns of salience, both of types and properties of objects, will be discussed in subsequent sections.

It should also be stated that there were many specimens that appeared in just a small number of photographs and that were discussed rarely, or not at all. These are the types of objects that generally do not appear at all in post-visit studies of children’s memories of museums (e.g. Piscitelli & Anderson 2000), which tend to highlight the more charismatic objects. The word cloud in figure 26 visualises the subjects of children’s photographs so that size of words accords with the frequency of that subject in the photographs.<sup>21</sup> This reveals something more of the texture of the children’s visits as a whole, and suggests that many objects, whilst not popular across the group, were still significant to some of the children.

## ***7.2 Directing the spotlights***

While it is not always possible to know exactly why children noticed some things rather than others, there are often definite hints towards why children’s attention falls on certain objects. There are various reasons why attention might be drawn to the objects discussed above — the salience of certain types of objects to the children themselves, other people drawing the children’s attention to the objects, and also the impact of differing modes of display on the object’s noticeability. This is not to suggest that

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<sup>21</sup> There are some differences between the objects displayed in this word cloud and those in the lists above, as the word cloud does not account for the number of children who took these pictures, whereas the above lists do.



children's preferences could arise entirely from within or entirely from outside influences, rather than in some cases conclusions can be drawn about the ways in which the salience of certain objects is increased by particular experiences, people or display techniques.

### *7.2.1 Spotlights directed by the children themselves*

During the interviews and observations it was clear that much of the children's interest in the things around them was personally driven — that they gave their attention to various things that were specifically of interest to them. The reasons for a particular child finding a particular object attractive are not, of course, straightforward, and this theme will be discussed further in the next chapter, which discusses the ways in which children make sense of the objects they encounter in the museum.

It has been noted many times that children tend to be more interested in and even excited by things in the museum with which they are already familiar (Anderson et al. 2002; Weier 2004; Dunn 2012). Certainly there were many examples of this during the interviews. Children were drawn to animals that they had encountered in other places, including zoos, school, and home; that they had seen on television, in film or in books; and that they had themselves as toys. For example, Kyle told me about the live eagle owl that had visited his school and the pheasant that his grandfather had run over; Daniel told me that he recognised the flying fish from the cartoon 'Octonauts'; Josh referred several times to having seen animals on television, including crocodiles, penguins and dinosaurs; Bonnie told me that she had a piece of pyrite (fool's gold) at home, and that she photographed the giraffe because she has a toy giraffe; and Karen was interested in the dodos because her teacher had talked about them in school. In all, 27 of the children mentioned these types of associations, and 19 interviews also included other family members giving reasons for children's familiarity with the objects. Only two interviews (Shama and Amar) did not involve any mentions at all of these outside associations.

An interesting example is that of penguins, which are relatively inconspicuously displayed in the museum (figure 27), and so were only photographed by five children. In spite of this, penguins appear in the above list of subjects discussed in the interviews, having been discussed by four of the children who photographed them, and also mentioned by another child who had not photographed them. All of these discussions



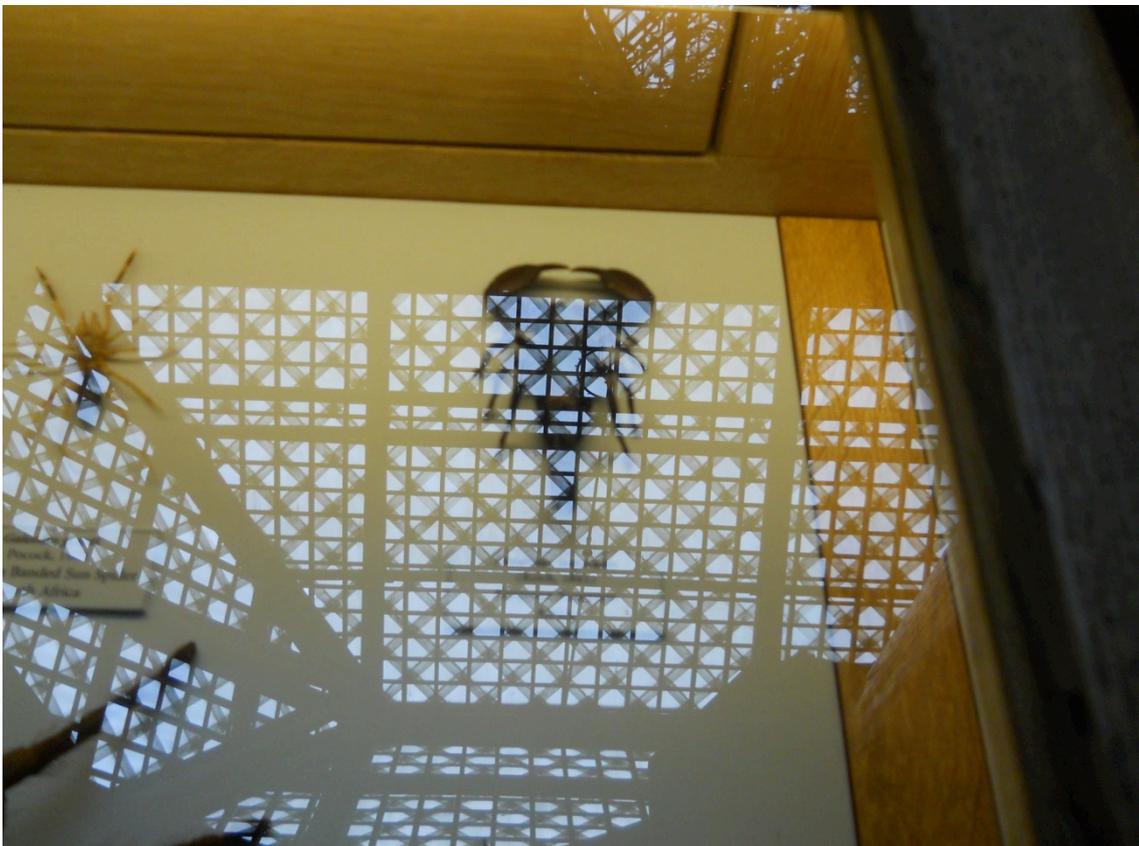
*Figure 27. Photograph showing location of penguin case (on shelf to the left).*

included references to the children's previous encounters with real, fictional or toy penguins: Marie mentioned the animation 'Pingu', Kiet told me that he had 'a teddy one', Josh described penguin behaviour that he had seen on a nature programme, Maisie (who had not photographed them) said that penguins were her favourite animal at the zoo, and Justin's mother said 'I think there are roughly a billion children's storybooks that feature penguins as characters'. This last comment in particular suggests the strong presence of penguins within the children's cultural context, and hence a possible reason why such an inconspicuously displayed object appeared brightly 'spotlit' for the few children who noticed it.

While all of the children were familiar with some of the animals and minerals in the museum, many of the children also talked about certain objects as 'favourites', or as

things (particular animals) that they loved. The children had often sought out, or been particularly excited to see examples of these favourites in the museum. This corresponds with Pekarik et al.'s assertion that 'the experiences that people sought in the museum seemed to be very closely tied to pre-existing individual preferences' (2014, p.8). One of the most notable examples from this research was that of John (4), who was fanatical about 'bugs'. His favourite was the scorpion, and this was the first picture that he chose to talk about (figure 28), because, as he explained 'I've got one at home and I love them, I'm really interested about them.' The tiny scorpion, positioned at the back of a table-top case, was so salient for John that it prompted over a minute and a half of intense conversation from him, including facts about scorpions and references to his own resin-encased specimen ('a pretend one in a glass box'). When, later in the interview, I asked what John's favourite object had been, he told me the scorpion, and his mother said 'I knew you were going to say that!'.

For other children, more challenging personal emotions spotlighted certain aspects of the museum. Greg was scared of the dark, and although a regular visitor to the museum, this had been the first occasion on which he had been brave enough to go into the dark



*Figure 28. John's photograph of a scorpion.*

booth displaying the minerals that glow under UV light. Overcoming this fear gave a strong emotional stamp to Greg's experience, so that he chose to look at the pictures of the minerals for a long time during the interview. Similar findings were noted by Fidler at al. in the case of a young girl in Manchester Museum who overcame her fear of a brass head to finally touch it, and then later chose to draw the head to represent her museum visit (2011, p.44).

Many of the personal reasons for objects being particularly meaningful are impossible to predict and unlikely to occur more than once. Karen spent around a minute and a half talking about her photographs of mice and rats, which, as her father explained, was because 'Mouse' was her nickname.

### *7.2.2 Spotlights directed by other people*

Family museum visits are social occasions, and the children's attention was often drawn to certain objects by other members of their group. One of the most notable examples was George (5), who focused heavily on fossils and minerals. Whilst across the whole group of children minerals accounted for 13.6% of photographs taken, in George's case they accounted for 36% of his pictures — almost three times the average. When I asked if he liked fossils and rocks, he told me, 'I like them, but not too much. My brother wants to be a palaeontologist.' George and his mother later explained how this interest had been passed from his brother to the whole family:

Elee: So you seem like you know quite a lot about things like rocks and fossils and things. Do you read any books about them or do you watch any programmes or anything like that?

George: Um, not really.

Mother: No, they're mainly learnt from your brother, aren't they, all those facts?

George: Yeah.

Elee: Oh, your brother who likes, who wants to be a palaeontologist?

Mother: Yes, he's very keen on rocks and fossils, and so [...] we've learnt from him, haven't we?

George: Yeah.

Elee: You've both learnt from him?

Mother: Yeah, we all have *[laughs]*.

Elee: The whole family?

George: Yeah.

Mother: Absolutely.

Although he was clearly very focused on and interested in the minerals, it became apparent that this spotlight was not shone by George himself, but by his brother, whose interest in palaeontology had furnished the whole family with information about fossils and minerals, and therefore had raised all of their attention to these specimens.

In Eloise's case, her older sister Amber's influence appeared to be less a case of contagious enthusiasm, and more one of micromanagement of Eloise's museum visit. This was hinted at in Eloise's photographs, three of which included Amber pointing to or touching a specimen (figure 29), suggesting the photographs may have been taken because Amber was drawing Eloise's attention to these objects. This influence was even more pronounced during the course of the interview, in which the sisters sat on the same



*Figure 29. Eloise's photograph of her sister pointing at an armadillo.*

chair, and in which Amber heavily influenced the conversation, even as I attempted to keep the focus on Eloise herself:

- Elee: Is there anything else that you want to tell me about the crocodile?  
Amber: [whispers to Eloise] Oh, the eggs. Eggs.  
Eloise: Eggs.  
Elee: Eggs?  
Amber: No, she wants to talk about the bird eggs. [...]  
Elee: Do you want to talk about the bird eggs or does Amber want to talk about the bird eggs?  
Eloise: Bird eggs.  
Elee: You want to talk about the bird eggs. Ok, that's fine.

The interplay between children's own interests and those of family members is also seen in the interview with Miriam, described in section 5.1.4, in which her father tells me that he made suggestions of what she should photograph. As this interview snippet showed, although Miriam's attention was being drawn to the museum ceiling by her father, she was choosing for herself how much attention to give it. Miriam's relationship with her father also gave extra meaning to the 'green crystals' (i.e. UV minerals), which she had seen previously and took him to see on this visit. But, as the interview with Imogen suggests, the fact that a family member has draw attention to something does not make that object (or the experience) interesting:

- Elee: So did you talk about lots of the animals as you were going round then?  
Granddad: We talked about some of them, didn't we?  
Elee: [...] Have you found out anything interesting?  
Imogen: No [laughs]  
Elee: [laughs]  
Granddad: [laughs] Thanks!  
Elee: But you've looked at some things, have you? And taken photos.  
Granddad: Granddad was a science teacher once, so I'm sorry about that.

Although the laughter in this snippet suggests that Imogen was joking, in fact the rest of her interview demonstrated an exceptional lack of interest in the museum. What is not clear from the interview is the degree to which Imogen's lack of enthusiasm stems from her personal response to this setting, from the presence of her grandfather, or from her reaction to the interview format. But it does seem that it is in spite of her grandfather's attempts to provoke her interest.

These examples suggest that while family members provide an additional source of spotlights to the child, the strength of the spotlight depends on a complex interplay number of individual factors, including the type of influence that the family member has on the child, and also the level of interest that the various members of the group have in the objects on display. In addition, as discussed in the previous chapter, the child's attention will be affected by the interplay between family members and the museum objects, with, for example, 'foraging' for interesting objects being part of the social script of the museum visit. In this case the children's perceptions of what is 'interesting' may be strongly affected by their anticipation that certain objects will prove popular with other members of their family, even where the family member themselves has not shone the initial spotlight.

### *7.2.3 Spotlights directed by the museum*

There is a view often expressed by museum professionals that young children's interest in museums depends largely on opportunities for them to 'do' things: to handle, manipulate or otherwise physically interact with objects in the museum. Graham Black, for example, states that '[a]ll children learn by doing and by imagining', that '[u]nsuccessful exhibits for children tend to be passive, with little or no interaction', and hence that museums should 'develop structured opportunities that seek to immerse young visitors into the experience — treating them not as passive observers but as participants' (Black 2005, pp.67–68). It is therefore of interest to explore the effect that the museum's modes of display and the potential for this direct interaction have on the object salience for the young children.

As described in section 4.2, Oxford University Museum of Natural History displays objects in three main ways: behind glass, freestanding, and touchable handling collections. The distinctions between these modes are not always clear cut — in particular, certain freestanding objects, such as the tyrannosaurus head, are often treated

by visitors as handling collections, although there is no label inviting touch. In spite of this, and of not having precise information about numbers of objects on display, it has been possible to carry out a rough analysis of the general appeal of objects displayed using each of these techniques to explore whether children were deterred by objects being displayed behind glass and their responses to objects displayed in different ways.

It was clear that handling collections were disproportionately heavily photographed. Piscitelli et al. suggest that touch intensifies the connection that children have with objects:

Children reason about things they can touch and into which they can project themselves physically [...] As young children engage in physical activities, they experience feelings such as excitement, anticipation, joy, frustration, empowerment, success and delight. (Piscitelli et al. 2003, p.14)

Although they account for a tiny proportion of the collections on display (no more than 40 objects in total), pictures of handling collections account for 14% of the photographs taken (227), suggesting that these objects were very attractive to the children. However, as discussed in chapter six, it does not necessarily follow that the reason for the attractiveness of these objects was that children could touch them. Several times, when children were asked whether they had touched a handling object, they said that they had not. Fidler et al. (2011, p.45) suggest that activities such as photography can provide an alternative source of interaction to touch, and indeed some parents suggested that the children's decision not to touch may in part have been because the children had photographed the object instead of touching it, or because the camera had been in the way. However, many children *did* touch objects, so the camera was obviously not an insurmountable barrier.

Rennie and McClafferty (1997, p.26) argue that children's thoughtful engagement with exhibits does not actually require physical interaction. In all, ten children talked about photographs of handling collections that they had photographed but not touched, and for these children, there still appeared to be a strong appeal to the handling collections. This may have been because the objects chosen for the handling collection meet other criteria for being appealing, such as being familiar or visually attractive, or it could be because the method of displaying handling collections — at easy viewing height for children, and with the possibility of being able to get very close and look at

the objects from all angles — adds to the attraction of the objects. Dunn (2012) has noted the appeal of objects that are either touchable or situated at an easy level for young children to access. It may also be that children perceive handling collections as more interesting simply by virtue of them having been designated handling collections, which may give children the message that these are things that have been particularly set aside for them. Oscar and George, who were highly engaged and intelligent children, both systematically photographed almost every handling object along the mineral aisle and on the handling tables, suggesting that these objects were perceived by the boys as being particularly worthy of note.

As stated above, the distinction between handling collections and those that were free-standing was somewhat imprecise. While, technically, handling collections have signs that invite touch, and while some of the free-standing collections had signs prohibiting touch, there were many objects, including the tyrannosaurus head and the sperm whale jaw, that did not have signs and hence were treated by many visitors as handling objects when the museum does not class them as such. The free-standing objects account for a similar number of specimens as the handling collections — around 40 in total, and were photographed a similar number of times, accounting for around 13% of the pictures taken ( $n=206$ ). The main difference between photographs of handling and free-standing objects is that, although there are more photographs of handling collections, a large number of these photographs were taken by a small number of children — the photographs by Anna, Oscar and George account for 36% of all of the photographs of handling objects. Therefore, looking at absolute numbers risks the figures being skewed by the preferences of this highly prolific minority of children. This can be evened out by looking at the proportion of photographs taken as a percentage of each child's total. The *mean percentage* of handling objects was 17.9%, compared to 19.1% for freestanding, and the *median percentages* (which give an idea of what is typical for the group by reducing the impact of extreme outliers) were 13.8% and 20.0% respectively. In general, then, the children actually seemed somewhat more drawn to photograph the often impressive freestanding objects than the smaller handling objects.

However, one of the reasons that many of the freestanding objects are not behind glass is because they are too large, consisting for the most part of skeleton and model dinosaurs and large skeleton mammals, and it is impossible to separate the effect of their size from the effect of their mode of display. As discussed earlier, children's

attraction to large objects has been noted previously (e.g. Piscitelli & Anderson 2001), and may partly account for these objects' popularity. The handling collections, on the other hand, are in many ways very similar to objects displayed in cases, and so are easier to compare.

The vast majority of collections in the museum are behind glass. The outer edges of the top and bottom floors are lined with cases, and there are around 50 tall cases and many meters of table top cases within the central area of the museum, which between them, hold many thousands of specimens, from full-sized model dinosaur heads to densely packed displays of fossils and boards pinned with insects. In addition, there is a significant number of individually cased specimens, which includes the tuna skeleton, large fossils, crocodiles, and several birds.

As the photograph map in figure 18 shows, children's interest in the objects in cases is not evenly spread. Some of the cases were not photographed at all, others were some of the most popular displays in the museum: the Laurasian Mammal case (containing, amongst other animals, the taxidermy wolf and lynx) was photographed 28 times by 13 children; the case of colourful euteleost fish was photographed by 23 times 11 children; and the individually cased taxidermy crocodile was photographed 16 times by 13 children. Overall, 880 photographs were taken of objects in cases, which accounted for two thirds (67%) of all the photographs of museum objects. The objects in cases also accounted for 60% of the objects discussed in the interviews. So while each individual handling or free-standing object was generally more appealing to the children than each individual cased object, in total the objects in cases still made up the main part of their visit, and were clearly interesting and important to the children.

### ***7.3 Intensity and tone of the spotlights***

The varying personal responses (affective, aesthetic or cognitive) that children had to the objects meant that different objects 'lit up' with different intensities and moods. Yet across the group certain patterns were apparent, and certain objects seemed to light up intensely on a regular basis. As stated above, the children regularly noticed and talked about objects with which they were familiar. Many of the children seemed happy to have seen animals such as penguins, owls, rabbits, elephants, and even snakes and pufferfish, all of which were talked about by two or more children, and often in terms of them liking or loving these animals. This appeal was often phrased in aesthetic terms,

with many children explaining that they took a photograph of something because it 'looked nice'. Tomkins and Tunnicliffe (2007) found that children expressed strong affective responses to natural objects and animals, talking about their liking and aesthetic appreciation of the objects. However, it isn't always clear whether the children were actually drawn by an aesthetic appreciation of the specimen, or whether this is simply their way of explaining that they like the object in question.

It is the case, however, that objects (particularly minerals) with visually striking properties were associated with enthusiastic responses from the children. Two of the most talked about of the objects were the pyrite and the ultra violet glowing minerals, which were each photographed by 14 children and talked about by 10 and 9 children respectively. Talking about her photograph of the pyrite, Shama (5) explained that she took the picture 'because it's really, really, really, really shiny.' While Caroline (5) told me that she photographed the UV minerals 'cause I liked the colours, and also it was very, very, very bright'. Children's attraction to bright and shiny objects has been noted previously, for example in Danko-McGhee's (2006) study of young children's preferences in an art gallery.

More surprising was the popularity of eggs, which are neither impressively large nor visually striking. The museum is dotted with displays of different eggs (fossil, reptile and bird), but most are not prominent. In spite of this, twelve of the children talked about eggs, sometimes extensively, varying from an interest in the type of animal the eggs were from (sometimes interpreted to be dinosaurs, even where they were not) and the ways in which animals cared for their eggs, to talking about the colour or pattern, to simply being fascinated by them. Jack even described beans in a pod as 'sort of eggs'. Many of the children also talked about eggs without being prompted by their photographs, suggesting that there was something particularly appealing about them. It is not clear, however, whether this fascination was driven by an interest in baby animals, in dinosaurs, or if the shape of eggs has a particular appeal.

Some of the objects which appeared to be most salient for the children were dinosaurs. All but one of the children photographed prehistoric reptiles, and 26 of the children talked about them during their interviews. What stands out in the above lists in section 7.1 is that the most popular dinosaurs are predatory. Indeed, the herbivorous iguanodons, while photographed by 20 children, were discussed by only two. It became apparent from talking to the children they were very much drawn to large predatory animals, in particular the predatory dinosaurs and the crocodiles. A focus on the

children's responses to this type of animal reveals interesting characteristics of the ways in which parts of the museum 'light up' for the children.

In spite of the differences between the children, their ways of talking about these predatory animals tended to be very similar, with a particularly strong focus on the animals' teeth. So, for example, 18 children talked about such teeth, using words and phrases such as: 'sharp', 'spiky', 'big', 'zig zag', and 'lots and lots of teeth'. The children's fascination with the teeth of predatory animals, as shown in their interviews, prompted me to search the photographs for further images of sharp teeth. This revealed that 8% of the photographs (n=129) included teeth of this kind, which means that, on average, each child took four photographs of predatory teeth. And only three of the 32 children did not take any photographs of this kind, examples of which can be seen in figure 30.

Because predatory animals featured so significantly in the photographs and interviews, further analysis was carried out into the ways in which the children focused on these animals compared to other animals, particularly in terms of the descriptive language used. Children's discussions about animals were often in terms of body parts. An analysis of these references revealed that the children's ways of describing predatory animals differed noticeably from the ways that they described comparable non-predatory animals (including dinosaurs, mammals, reptiles and birds). Firstly, as well as mentions of teeth, the children were much more likely to describe other body parts of predatory animals than they were of non-predatory animals. There were 81 mentions of body parts of 17 predatory animals (28 of which were teeth), compared to 40 mentions of body parts of 17 non-predatory animals.<sup>22</sup> Secondly, these further references were particularly focused around the faces of the animals in question (eyes, mouths, and tongues), with 22 references to the faces of predatory animals, and only 14 references to the faces of non-predatory animals. There were also seven references to predatory animals' claws.

This suggests that the children were paying more attention to particular physical features of the predatory animals, and in particular those features that were associated with the animals' predatory nature, with this focus being much less for non predatory animals. The *strength* of children's attention on predatory animals was also clear from

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<sup>22</sup> The identical number of predatory and non-predatory animals here is coincidental but useful.

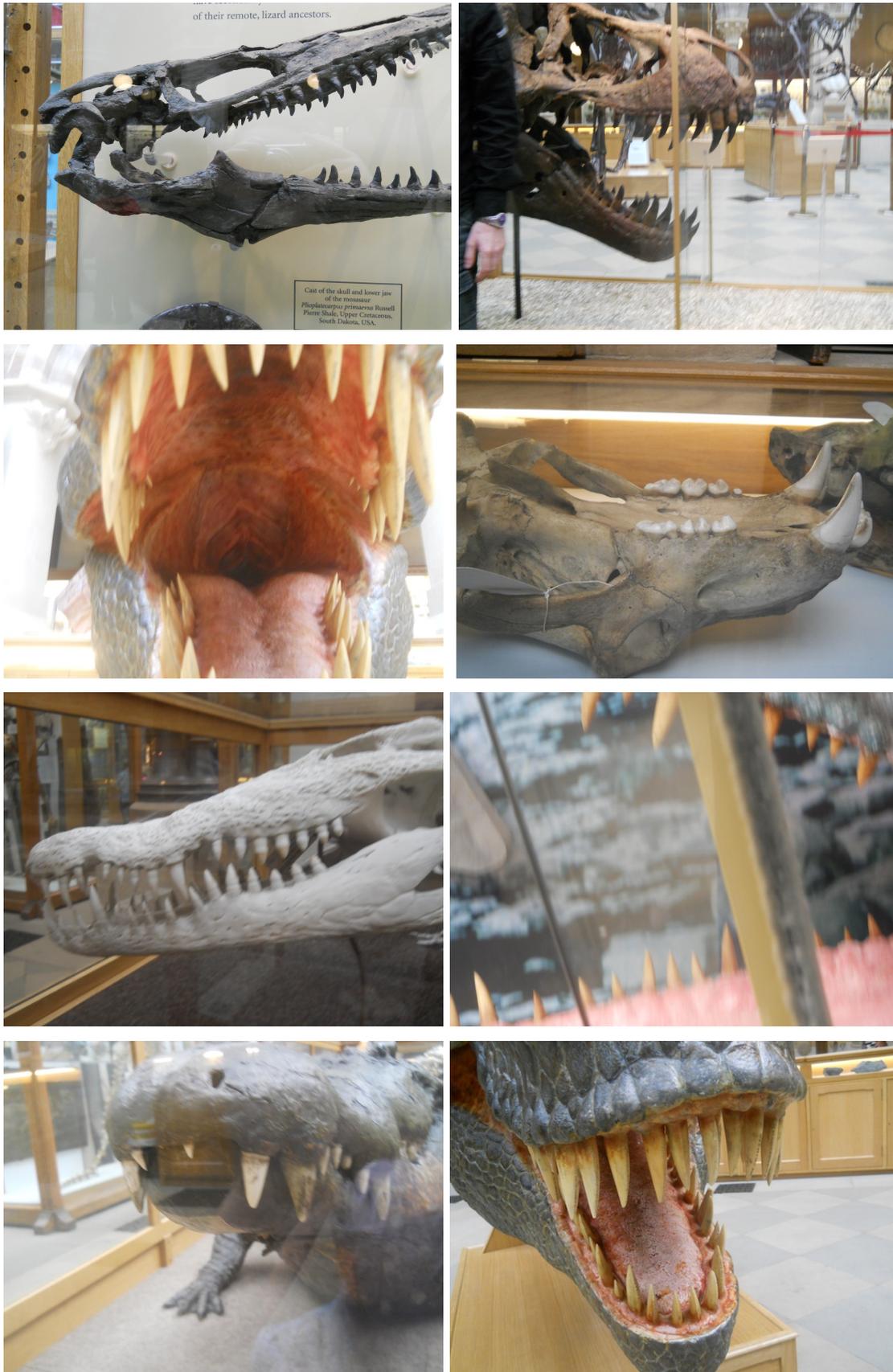


Figure 30. Photographs of sharp teeth by: Kyle (x2), Greg, Karen, John, Harvey, Anna and Amar.

the levels of excitement and intensity that they demonstrated as they spoke about these animals:

Elee: Can you tell me anything else about what you can see in this picture?

Marie: The scary teeth, the scary teeth!

[Crocodile]

Elee: What did you like about it?

Greg: Cause it's got very sharp teeth.

Elee: [...] Did you do [...] anything when you saw the T. rex?

Greg: Um... I looked inside his mouth.

[Tyrannosaurus]

Elee: And why did you take this picture?

Haden: Because it has really, really sharp teeth.

Elee: You're showing me your teeth there, aren't you? [...] So do you like things with sharp teeth? Cause you've shown me two different things now that have got sharp teeth, haven't you? The crocodile and this underwater dinosaur. Yeah? [...] Is there anything else you can tell me about this?

Haden: Um ... a jaw.

[Plesiosaur]

Amar: And I touched its teeth.

Elee: You touched its teeth? What were its teeth like?

Amar: Uh, really... they were a bit hard... but they weren't very sharp to me.

[Tyrannosaurus]

Elee: Now why did you take this photograph?

Anna: Because it's got scary teeth on it.

Elee: It's got scary teeth? What's scary about its teeth?

Anna: It can eat people.

[Crocodile]

Josh: I stuck my head in it's mouth.  
Elee: [...] Why did you do that?  
Josh: I thought it would bite my head off.  
[Tyrannosaurus]

In the above extracts the children are demonstrating the nature of their focus on predatory animals in a number of ways: they are *emphatic* in their descriptions of the teeth (Marie & Greg); they are *fixated* on the teeth and jaws, using both words and actions to show their level of interest (Haden); they *inspect* the teeth by looking (Greg) and touching (Amar); and they are fully aware that these animals, were they alive, would be able to eat the children (Anna and Josh).

Tunncliffe (2000) describes similar conversations from young children looking at animatronic dinosaurs at London's Natural History Museum. She quotes the following conversation between three children:

Boy: Wow look they are meat eaters  
Boy: Christopher look they are meat eaters aren't they  
Girl: They ain't very scaring  
Boy: Look at their claws!  
(Tunncliffe 2000, p.747)

However, because Tunncliffe is focusing her analysis on the children's learning and knowledge, she categorises these comments as simply being about feeding behaviour, and groups them along with comments from children about herbivorous dinosaurs. Similarly, Crowley and Jacobs describe a conversation in which a four-year-old boy talks graphically about dinosaurs eating and killing, and finally says 'I'm not even afraid of dinosaurs' (2002, p.345). In both of these examples, the researchers are interested in demonstrations of the biological learning that is taking place, rather than on the children's deep emotional responses to the predatory dinosaurs. I would argue that, by looking at the child's perspective, it appears that the dinosaur's predatory behaviour and features (sharp teeth and claws), and the subsequent scariness of the dinosaurs (and, by implication, the children's bravery) are equally important in understanding how the children are engaging with these animals. Likewise, Ash tells us that 'even very young learners assume that biological forms have functions, for

example, sharp teeth are useful for eating’ (2004b, p.857), but does not mention that it is not simply the act of eating that is significant, but the fact that these animals could potentially eat the child.<sup>23</sup>

The strength of some children’s responses to these predatory animals can be seen even more dramatically in the observations. Three separate observations included children who were genuinely afraid of the model tyrannosaurus head (figure 31):

The grandmother and older boy (~5) are looking at the model tyrannosaurus head. The father is holding the younger boy (~3), who is crying. The older boy is reassuring his brother by repeating “He’s not real, Sam” (referring to the tyrannosaurus). [Observation 06]



*Figure 31. Oscar’s photograph of the tyrannosaurus head.*

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<sup>23</sup> Dockett et al. (2011) also refer briefly to children’s comments about being eaten by predators — hyenas and lizards — however in this case they group these comments together with children’s imaginative responses to the museum.

The older boy (~9) is posing for photo by the model tyrannosaurus head. The younger boy (~5) backs away, and won't be persuaded to go close for a picture. His father touches the teeth and says "Am I brave?" and the boy nods.

[Observation 12]

The family look at the tyrannosaurus. The boy (~4) is scared by it and backs away. He asks if its real and his parents say it isn't. [...] They ask him if he wants his picture taken with the tyrannosaurus, and he shakes his head. I tell them that it scared me earlier. The boy takes a sweet and holds it up towards the tyrannosaurus, and I joke that if he gives it a sweet it might be friendlier.

[Observation 56]

Not only was this tyrannosaurus head scary for the children — the last of these observation extracts refers to an incident in which this model head genuinely scared me, which is worth describing as it may give a more personal insight into an aspect of children's experiences in this museum. During the photo-elicitation phase of this research the tyrannosaurus head was regularly photographed, and was hugely popular with children, who would often put their hands or heads into its gaping, tooth-filled mouth. At the time of my final, observation-based visit to the museum, the head had been relocated from the floor of the prehistoric reptiles section (where it is shown in figure 31) to the base of the tyrannosaurus skeleton cast. In this new position, the head was about a meter higher than it had been previously, and was therefore at adult height, rather than child height. I had seen this head many, many times before, but was unused to its new location. On one occasion I turned the corner to come face-to-face with the tyrannosaurus, and was utterly startled by it. For a moment, I was frozen in terror, and felt my heart beat in my chest. Then I rationally reminded myself (like the boy in observation no. 6) that it was 'not real'. But when I looked back, the sense of terror stayed with me, and it was some time later in the day that I was able to look at the model head without a residual feeling of fear.

The fear that I felt seemed very similar in kind to the fear being displayed by the children in the three observations, and impressed upon me quite how powerfully one can respond to a model. However, a more common response than terror was one combining mild fear and caution with intense fascination. This is closer to the response exhibited by many of the children in the interviews, and was also present in many more

of the observations, 19 of which involved references to predators' teeth, to the scariness of these animals, or to the fact that they could bite or eat the children. Of these, only the above three involved children being genuinely scared of the animals.

It seemed that part of the appeal of facing these ferocious beasts was the sense that it generated in the children of their own power and bravery. Feder describes this in the reaction of his young son in the American Museum of Natural History:

The dinosaurs have such big teeth that it becomes necessary for Superman to appear. Sam thrusts his little fist out in front of him. "Get back in your cage, monster!" he yells, then looks up at me. (Feder 1989, p.15)

Likewise, Fidler et al. noted that, while young children talked about objects in an Egyptology gallery being 'scary', 'this fear was not necessarily negative' (2011, p.38), and that scariness 'stimulated interest and discussion' (ibid. p.45).

There may, however, be a more fundamental drive in the children to look closely at these predators. Evolutionary psychologist H.C. Barrett predicts that young children should be predisposed to being both fearful of and interested in predators, as during human evolutionary history this would have ensured that the children stay safe, whilst also being highly motivated to learn about potentially dangerous animals.<sup>24</sup> He suggests that this behaviour could occur in response to a 'minimal set of prespecified cues to dangerousness (e.g. size, sharp teeth)' (Barrett 2005, p.217). While there is currently little evidence to demonstrate this phenomenon, LoBue and DeLoache (2008) found that young children *were* biased towards more quickly detecting evolutionarily threatening animals than non-threatening animals. It is interesting to witness this pattern of behaviour being played out in the museum, although the relationship between such an 'instinctive' response and the cultural context (e.g. dinosaur movies, toys and books) in this case is not clear. In spite of this caveat, it certainly seemed that in general the children's responses to large predators were the most intensely emotional and most brightly spot-lit of their responses to the objects they encountered in the museum.

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<sup>24</sup> Echoing E.O. Wilson's concept of 'biophilia' (1984), I have previously referred to this response as 'biophobophilia' – an enjoyment of the fear of living things (Kirk 2013).

## **7.4 Chapter conclusion**

In this chapter, children's attention towards objects in the museum has been viewed using the metaphor of spotlights. Across the entire group, and shown through the children's photographs and words, particular objects were seen to light up more frequently and intensely than others. However, the children also photographed and talked about less charismatic objects which lit up irregularly across the group, but still formed part of the texture of individual children's museum experiences.

The children's attention was often directed by their prior experiences, which drew them to familiar and favourite objects in the museum, but also to more disturbing aspects of the museum connected to fears and phobias. Family members were also influential in making children aware of certain objects, although the correlations between other people's attraction to objects and the children's personal responses were not straightforward, and depended also on the nature of the relationships between the children and the other members of their group. It also appeared that the museums' modes of display were significant in making some objects more salient to the children than others. In particular, handling collections and free-standing objects were photographed and discussed relatively more often than objects in cases. However, glass cases did not appear to be off-putting to the children, and most of the discussions were about these main collections.

Objects which regularly and most intensely lit up for the children included large and familiar birds and mammals, and bright and shiny minerals, but also smaller types of object such as eggs. However, the most salient group of objects across the whole group of children were the large predators, including dinosaurs and crocodiles. The children's responses to these animals were often highly emotional, and also driven by an intense curiosity to look and discover more.

## Chapter 8. Making sense

From the data it is clear that children were highly driven to understand the things that they encountered within the museum, and that learning was often a priority for them, with many of them talking about things that they had found out during their visit. This chapter explores the ways in which the children made sense of museum objects and built these things into their understandings and views of the world. As this is a more verbal and cognitive aspect of experience, this final section of the analysis draws particularly on the children's words from their interviews.

The chapter will begin with a practical look at their learning as a social process that, although driven by their own curiosity is nevertheless often motivated (or impeded) by others. It will go on to suggest that the children's learning within the museum can be divided into two main forms: categorising and connecting. This division bears some similarity to the categories used by Melber (2007, p.346), and borrowed from Moreno (1991) of 'perceptual' and 'conceptual' themes in conversation. Categorising involves behaviours such as naming and observing (noticing) features of objects, with children having a range of abilities and strategies to make sense of, and talk about, the concrete aspects of the things they encounter. The second aspect of learning, connecting, includes the various ways in which children tie the information from the museum into their broader understandings of and interactions with the world. This includes linking to past experiences, building on existing knowledge and responding imaginatively to museum objects. Within both of these forms of learning, the area between understanding and not understanding is particularly revealing, as children grasp at meanings and attempt to incorporate the museum objects into their conception of the world.

The process of making sense of the museum is not, however, simply a matter of learning about the objects. It is also a matter of building and consolidating the children's identities, as people who are interested in certain aspects of the world, and as people who know how to use museums to fuel these interests.

## **8.1 Social Learning**

Although in part motivated by individual curiosity, the museum learning experience, for children too young to visit on their own, is always necessarily social. The social nature of museum learning has been well documented (e.g. Dierking 1989; Blud 1990a; Falk & Dierking 2000; Bitgood 2002; Leinhardt et al. 2002), and families are known to prioritise learning as part of their agenda for visiting museums (Falk et al. 1998). Within this study, learning was clearly important for both children and parents, and was therefore something of a joint enterprise, in which each was involved in structuring the other's learning and in maintaining the drive to learn. This was partly for very practical reasons: the children in this study were generally, although not always, too young to read labels, and so much of the additional information that they gained about the objects in the museum came from the people with whom they were visiting, who could read the text labels for them and co-construct knowledge (Crowley & Jacobs 2002). In this way, children's learning was often scaffolded by parents or older siblings (Melber 2007), although in some cases the children themselves were guiding younger siblings, and in many cases the parents and children could be seen to be learning together, often led by the personal interests of the child or the shared interests of the group as a community of learners (Falk & Dierking 2000).

Some of the children continued their learning conversations with their siblings and parents during their interviews, thus revealing aspects of the processes and outcomes of their learning (Leinhardt et al. 2002, p.ix). While the interviews do not show exactly how these conversations were carried out in the museum, it is reasonable to assume that the ways in which children and their families communicated during the interviews were at least partly representative of the ways that they communicated and their social knowledge construction while they were in the museum.

It was apparent from the interviews that a desire to learn was a significant part of some of the families' agendas for visiting the museum in the first place. For example, four-year-old Rhys's family decided to visit the museum because he wanted to know more about dinosaurs, as his mother explained:

What did you keep asking me about the dinosaurs? [...] He asked to see the dinosaurs, yeah. Because, I don't know, he's become a bit obsessed with them. [...] He wanted to see the dinosaurs but I had to explain that they weren't alive

any more. [...] And then he asked me if they were in heaven. [...] And then I said I would take him to see the dinosaur bones, which was the closest we would get to seeing real dinosaurs.

Learning had motivated this family to come to the museum, and continued throughout the visit and even into the interview, during which, and in spite of Rhys's reticence to speak, his mother continued to discuss and demonstrate the ways in which they had learned while in the museum. She both repeated and continued their learning conversations, for example by encouraging him to think about the shape of dinosaur teeth and how this related to what dinosaurs ate. For somewhat different reasons, learning was also the initial motivation for Karen's visit, as her class at school had been asking about dodos, and so her teacher had discovered online that there were dodos at this museum, and recommended that the children visit.

Although learning was either explicitly or implicitly important to many of the children, and although it was often a social process, this process was neither straightforward, nor universally successful. Many previous researchers have focused their attention largely on the learning conversations between parents and children, and have given less attention to those between siblings (e.g. Crowley & Callanan 1998; Melber 2007; Bitgood et al. 2011). In contrast, this research often highlighted the influence of (usually older) siblings, who tended to be quite dominant in the interviews.

One of the most pronounced examples of sibling influence was that of Eloise (5) and her sister Amber (6), who sat together on the same chair during the interview. Often, Eloise gave an explanation or opinion which Amber contradicted, leading Eloise to change her mind to match her sister, as in the following conversation:

- Elee: So is there anything you can tell me about these [eggs]?
- Eloise: They're all different colours.
- Elee: They are different colours, aren't they?
- Amber: And all different shapes and sizes.
- Elee: Why do you think that is?
- Eloise: Cause they... Some are big eggs. Some are big dinosaurs.
- Elee: They're from dinosaurs, do you think?
- Amber: No, birds.
- Eloise: Birds.

While in the above example Amber was demonstrating her superior knowledge, she had a significant influence on Eloise even where her own answers were guesses. In the following example, Eloise has selected a photograph, but does not know what it is (figure 32) and again Amber leads her answer:

- Amber: What is that?  
Elee: So what is it? You tell me?  
Amber: Turtle?  
Eloise: Is it a turtle?  
Elee: A turtle? Is that what you think? I don't know.  
Eloise: I think it's a turtle.

The interactions between Amber and Eloise very much echo the findings of Colin Tudge (1990), who states that children's confidence is as important as their competence in scaffolding other children's learning. Thus, even where a child is wrong, if they are highly confident (as Amber is) they can effectively influence the views of a peer or



*Figure 32. Eloise's photograph of a 'turtle'.*

sibling. I would add that as well as confidence, the importance of this ‘teacher’ child to their peer or sibling will also very much add to their influence.

Overall, it seemed that siblings’ influence was more immediately noticeable than parents’, but their ability to successfully scaffold the children’s learning was lower than that of the parents. While siblings could be quite forceful in the interviews, parents tended to hold back and encourage the children more gently. This may be representative of their style of social learning in the museum, or it may be because parents were more aware that the interview was ‘testing’ their child, and knew that they needed to let the child give their own perspective, while siblings, especially those close in age to the child participants, were less aware of the conventions of interviewing. This parental ‘holding back’ may also mask incidences where parents themselves are unsure and unconfident of how to answer children’s questions.

What does seem to be the case is that, to the extent that learning in the museum is social, it is dependent on the status and confidence of family members in relation to each other as much as it is dependent on their knowledge of the ‘right answers’. It should also be noted that museum learning does not have to be social, and that, as Tunnicliffe notes, ‘[l]earners can “stand and stare” and interpret what they notice’ (2013, p.190) individually, as well as being influenced by others. The following analysis explores the ways in which the children, both alone and with their families, made sense of their museum encounters.

## **8.2 Categorising**

As has been frequently noted over the past few decades, museum visitors, and particularly children, are most likely to engage in discussions about the *concrete* aspects of objects, and less likely to discuss abstract concepts (e.g. Laetsch 1982; Taylor 1987; Borun et al. 1996). Borun et al. break down family learning conversations into three stages: identifying, describing and interpreting/applying (1996, p.126). They suggest that most family conversations revolve around only the first two of these stages, representing those aspects that are more concrete and less abstract. Much of children’s interest around objects centres around two concrete questions: ‘what is it?’ and ‘what is it like?’. In essence, what they are doing is building their taxonomies of the objects in the museum, drawing on their knowledge of the objects, their (sensory) means to

discover more about them, and their linguistic ability. Within this research, this pattern was particularly manifested as a strong propensity towards the children naming and describing things. The ways in which they went about doing this can reveal something of the ways in which they related to museum objects.

### 8.2.1 Naming

As is suggested in section 7.2, children's acts of naming animals in the museum often seemed to arise from the pleasure of recognising a familiar and sometimes favourite animal. In many of the interview transcripts, children's naming of these animals is followed by an exclamation mark, used to denote the excitement in children's voices on recognising the animals. Tunnicliffe and Sheersoi found that interactions at natural history exhibits usually begin with naming, which they describe as 'a basic human need' (2009, p.3). And Reiss and Tunnicliffe similarly note that young children's talk around natural history dioramas usually revolved around labelling animals that were already known to them (2011, p.449).

Even where children did not know the specific names of objects, they could often find a way to refer to the things they noticed, although their levels of accuracy accord with Bruner and Watson's statement that 'reference can vary in precision from a rather woolly vagueness to a proper singular, definite referring expression' (1983, p.67). So while many children talked generically about 'dinosaurs', and most knew the name of the 'tyrannosaurus', (or 'T. rex'), a few children were able to name less well-known species of prehistoric reptile: ichthyosaur, megalosaurus, pterodactyl, liopleurodon, iguanodon, utahraptor and so on. Other children correctly and specifically named other animals or minerals, such as the eagle owl, Japanese spider crab, hammerhead shark, pyrite, and stalactite. John (4), following the lead of his favourite television programme *Deadly 60*, even referred to crocodiles as 'crocodilians'.

Young children's ability to remember the long names of dinosaurs is particularly renowned. Palmquist and Crowley state that '[o]ne of the *necessary* features of childhood dinosaur expertise is the ability to correctly label representations of dinosaurs' (2007, p.790, my emphasis). However, knowledge is about more than naming, and Kyle, for example, challenges Palmquist and Crowley's assertion: he was one of the children who was most knowledgeable about dinosaur *behaviour*, but was only able to name one of them (and this one he named incorrectly, referring to the

utahraptor as a velociraptor). The other prehistoric reptiles that he recognised and discussed he referred to instead by descriptive names: ‘basher head’ for pachycephalosaurus, ‘fishy one’ for ichthyosaur, and ‘one with big jaws’ for plesiosaur. He claimed (somewhat improbably) that when he had found out about the dinosaurs on television ‘it didn’t tell us the name on the dinosaur programme’. This suggests that remembering names may be a skill in itself, which some children have to a greater extent than others.

Indeed, Malt et al. (1999) argue that, while naming is a part of communication, recognition of an object’s properties is not. Therefore, while having an interest in an object and being able to name it are highly likely to appear in tandem, their co-occurrence is not necessary. Again, Greg (4) spoke about several things in which he was clearly interested (the UV minerals, liopleurodon and red panda), but for which he did not have names, stating ‘I can’t remember the name’. These children are at an age in which their vocabularies are expanding: they are on the cusp of having the ability to name the things that they see, and many of them talked about not knowing what things were, or described things in only the most general terms, rather than using specific names. In cases where children didn’t know names, finding out what things were was often important to them, so that Josh said that he did not know what a dinosaur was (utahraptor) but that he was ‘looking into it’.

There was even evidence of some of the children continuing to learn names during our conversations, and discussions in which children actively learned or asked about names occurred during at least six of the interviews. Bonnie’s father encouraged her to remember the name of the eagle owl, and then later told her that the pyrite was ‘fool’s gold’, which she repeated as she memorised the word. Oscar chose to look at his photograph of an ichthyosaur. He could not remember the name (although, like Kyle, he was knowledgeable about the fossil), so his mother reminded him, and later in the interview he referred to the ‘ichthyosaurus’ by name. He also remembered a difficult name that he learned on a previous visit:

Elee: Do you know what that is?

Oscar: Um... um... A utahraptor.

Elee: Oh my goodness, wow! You got its name exactly right. A lot of people think it’s called a velociraptor, but you know better.

Oscar: It’s a utahraptor.

[...]

Mother: He must have remembered, because I didn't remind him.

Elee: Really?

Mother: He must have remembered.

Elee: You've got a good brain for remembering things about dinosaurs, have you?

Oscar: Yep.

It is possible that the amount that children discussed names during the interviews was skewed by the fact that they were being asked about the subjects of their photographs, which might be more likely to lead to naming-based conversations. However, the observations suggest that naming is a hugely significant part of visitor activity. Over half (n=46) of these short observations involved visitors specifically naming the specimens (usually animals) that they were looking at. This was driven by both parents and children: sometimes children named something (n=25) or asked for a name (n=8), and other times parents named something (n=15) or prompted the child for the name (n=5). They also worked together to get the names right, for example by correcting the other's naming (n=6, including one child correcting an adult) or by children repeating names used by others (n=6).

During a large number of the observations, it was clear that simply naming an animal was satisfying enough, and neither parent nor child discussed the animal further. Indeed, Fidler et al. found that young children's interest in museum objects 'was more likely to be at the level of identifying what the object is' than broader questions of where it comes from or how it relates to people's lives (2011, p.38). Take, for example, observation 66, between a boy of around three years and his father:

They walk to the moa skeleton, and the father says "It's an ostrich", which the boy repeats, but the man then sees the label and corrects himself. The boy sees the shoebill stork and says "It's a pterodactyl." His father reads the label & corrects him. They go around the corner to the crocodiles, and the boys says "I found another crocodile, and another." [Observation 66]

In cases such as these, naming almost seems to be a way for the children to 'collect' the specimens around them. In other cases, children seem to be naming to demonstrate their

knowledge to family members, because they are pleased to see something that they recognise, or to draw family members' attention (Dooley & Welch 2014).

Where children demonstrate their knowledge, they are often congratulated by the adults, meaning that even the simple act of naming can be associated for the children with a sense of accomplishment, as it was for Oscar when his mother and I congratulated him for remembering the utahraptor. Another example can be seen in observation 22, involving two women and a group of four girls and boys, aged between four and seven years, who are looking at the handling specimens in the mineral aisle:

The children are touching the petrified log, then run to the ammonite. The girls touch it, with the younger girl (~4) saying "round and round and round...". The women and boys come over. One woman asks the children if they know what it is, and prompts them with "Am... Am...". The younger boy (~4) tries to guess, but can not get it right, and then the younger girl says "Ammonite". The women congratulate her, and one says she must have remembered it from talking about it on a previous visit. [Observation 22]

Within this process of naming, children are also expanding and refining their definitions of things, as in the following observation:

The mother points to the giraffe skeleton and asks the children if they know what it is. The girl (~5) guesses that it is a dinosaur, but her mother says, 'No, it's something you can see at the zoo'. They walk behind the giraffe and look at it. The girl guesses 'giraffe' and her mother says 'yes', and they look at the label. [Observation 25]

With the help of her mother's scaffolding the girl in this observation is expanding her definition of 'giraffe' to encompass giraffe skeletons (which are in many ways unlike the living, moving, patterned giraffes that she may have seen previously), whilst also refining her definition of 'dinosaurs' so that it does not include all large skeletons.

One child, Rhys, seemed to be grappling with the very concept of names. During the interview, he asked about the name of a dinosaur, but did not seem to understand that name was for the *type* of dinosaur, rather than it's own personal name.

Rhys: Mum.  
Mother: Yeah.  
Rhys: What are the dinosaurs' names?  
Mother: One's called a Tyrannosaurus rex.  
Rhys: That one's name?  
Mother: Tyrannosaurus rex, yeah, that's what he's called.  
[...]  
Rhys: That's his name?  
Mother: Oh, they didn't have names darling. [...] It's the type of dinosaur it is.

### 8.2.2 Describing

As stated above, many researchers have noted that young children's conversations about museum objects tend to revolve around the concrete aspects of those objects (Diamond 1986) and that children's conversation in museums can be richly descriptive (Anderson et al. 2002). Similarly, the children in this study often began by naming, but went on to identify features of the animals or specimens they were looking at (Tunncliffe & Scheersoi 2009). Sometimes, in contradiction to Borun et al.'s (1996) categorisation, this describing occurred even without naming, so that George says of his picture of a stalactite: 'I don't know its name, but I do know what I think it looks like'.<sup>25</sup>

This suggests that the answer to the question 'what is it?' does not have to be a name, but can also be a description. These descriptions can reveal aspects of children's developing understanding of the categories of things they encounter in the museum. So, for example, Clara refers to dinosaur eggs as 'skeleton eggs'. While she is technically wrong, her description partly makes sense, as dinosaurs are often presented in the form of fossilised skeletons. Clara noticed that being skeletons is a defining feature of dinosaurs, and extrapolated this to their eggs, instead of fossilisation being the common property of dinosaurs and their eggs. Children's descriptions also hint at the interplay between visual and tactile experiences, and the difficulties of describing feelings in words, so that, for example, Delia says that the pyrite feels 'sparkly'.

The children frequently talked about objects in terms of their observable physical features. The interviews were analysed for instances in which children described the

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<sup>25</sup> He thought it looked like a rocket.

museum objects in terms of size, surface (colour, pattern, texture etc.), shape, and body parts (for animals). For example:

Miriam: It's a shell and it's really colourful.

Clara: There was a lovely pattern on the snake.

Amar: It was a golden crystal [...] it looked really gold [...] and really shiny.

Haden: The giant fish [...] it's really big.

Bonnie: The owl looks nice and soft.

Caroline: I liked this dinosaur's wings, because I like the colour.

These descriptions were often accompanied by aesthetic and emotional expressions of liking or loving, and many children gave the visual properties of objects as reasons for having photographed them:

Elee: And why did you photograph this dinosaur's head?

Maisie: Because it was, um, patterny.

Elee: And why did you photograph the monkey?

Harvey: Because he's ... he's got ... because he's furry.

While the physical features of objects certainly seem to be very important to children, there are reasons to be cautious of giving too much weight to the prevalence of these descriptions in the interviews. Firstly, while some objects may be interesting to the children because of their colour or pattern, it may also be that children are not always able to articulate their reasons for being interested in something. Because the physical features could be seen immediately from the photograph, the children were able to describe these without having to know or remember anything else about the object. This is suggested by the incongruity of Maisie and Harvey's explanations above.

Secondly, it should not be assumed that the use of descriptive language is solely representative of the children’s own interests in the objects. Fidler at al. found that the drive to describe colour, shape and form of museum objects was also very much driven by parents (2011, p.39). Ally, for example, barely spoke during her interview, but was encouraged by her mother to describe the animals in the museum in terms of their colour. Speaking on behalf of Ally, her mother told me that: ‘she liked the colour of the fish,’ and ‘we liked those ’cause of the colours, didn’t we?’. It is therefore not clear whether children’s use of descriptive language in the interviews reflected the focus of their own observations, or whether it reflected adult-initiated conversations that they had around the museum.

These caveats aside, there are further specific interesting features of the children’s descriptions. In particular, descriptive language was one area in which there was a marked gender difference. Across the whole group, boys were more likely to use descriptive language than girls, and five year olds were more likely to use this sort of language than four year olds, as shown in table 11 below.

It is likely that the difference by age can be explained by the children’s linguistic development. The difference between girls and boys, however, is interesting not just because of the *amounts*, but also the *types* of descriptive language that each gender uses. A more detailed breakdown of descriptive language by age and gender shows that boys were more likely to describe objects by their shape, size and with reference to body parts, while girls were *very* much more likely to describe things according to surface features, including colour, sparkliness, texture and pattern. Figure 33 shows the average number of times children used particular types of description according to their age and gender.

*Table 11. Average incidences of descriptive language used per child*

Boys aged 5	15.7
Girls aged 5	14.6
Boys aged 4	12.9
Girls aged 4	9.1

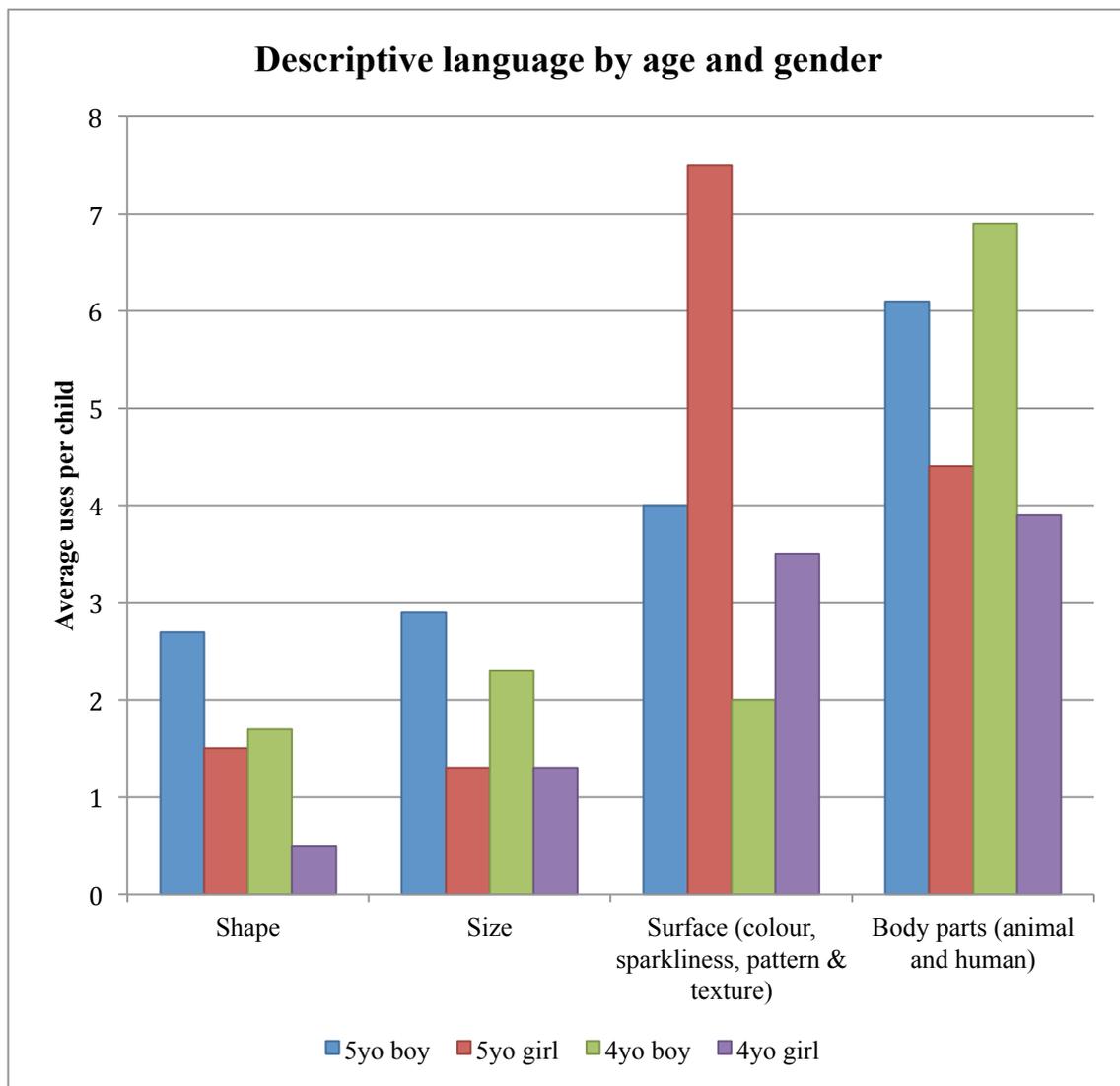


Figure 33.

One of the most common categories of descriptive language across the whole group was colour. During the interviews 25 children made references to colour a total of 60 times, which is enough to allow for an analysis of these patterns across the group. Figure 34 shows the number and type of these references.

This analysis shows that girls were very much more likely than boys to talk about the colour of something as an aesthetic preference, and that this was most pronounced for five-year-olds. The most striking example of this was Miriam (5), who describes almost every object in terms of her preference for its colour:

... a green crystal, cause I like it the best

I like the colour [of a shell] and it's my favourite colour [...] the purple bits

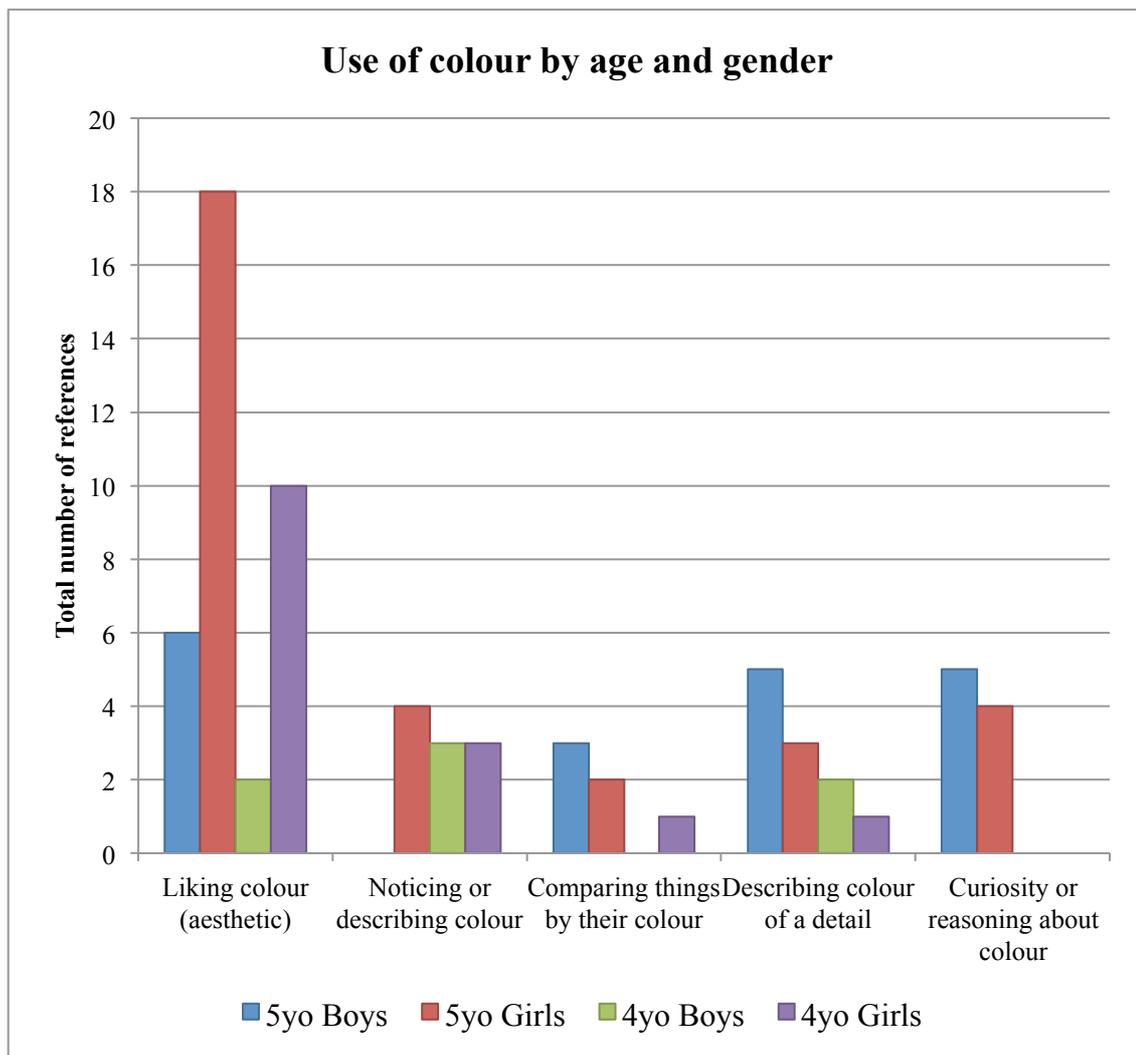


Figure 34.

In contrast, it appears that boys were somewhat more likely to use colour as a way of describing particular details of an object, such as parts of an animal's body, or to be curious about an object's colour, or to use colour as a way of explaining or understanding something. Take this quote from Josh (5), about the utahraptor:

[in the] Walking with Dinosaurs films I thought that it had that dinosaur in it, but it didn't have any spots on it. [...] But it did have the blue edges around the eye. [...] It did have the stripes on the arms.

While this division is not universal (there were boys, such as George, who showed a strong liking for objects according to their colour, and girls, such as Clara, who reasoned about colour, or Eloise, who was curious about colour), in general, it suggests

that girls' observations of the objects in the museum are more likely to be aesthetic, whilst boys' observations are *somewhat* more likely to involve trying to understand the functions of the objects in question. As has already been said, the small size of this study group can only hint at patterns such as these, and a larger study would be needed to give stronger evidence of any gender differences.

The increase in the strength of the girl's liking for colour as they got older is, however, in line with a study by Boyatzis and Varghese (1994), which found that girls were more likely than boys to express strong emotional preference for bright rather than dark colours, and that this preference increased with age (across a group from two to seven years). They suggest that this is very much because of gender socialisation, in which children learn what colours are appropriate for their own gender. It may be that not only the preference for particular colours, but also an increased focus on colours in general is something that girls learn to do. These findings also resonate with Tunnicliffe's comment about children in natural history museums, that boys engaged more in categorising, whilst girls expressed more emotional attitudes. Or, as she more bluntly states, 'boys want facts and girls feelings' (Tunnicliffe 2000, p.748).

### **8.3 Connecting**

While most of children's learning conversations within the museum appear to be characterised by naming and describing, a smaller number lead on to deeper connections. Although this section is about this deeper learning within the museum, it does not attempt to categorise the types or areas of knowledge and understanding that the children demonstrated. Rather, it explores the ways in which the children went about incorporating information from the museum into their wider perceptions and experiences of the world.

The ways in which the children actively made sense of the things in the museum was very much down to their individual personalities and experience and as a result there are fewer similarities between these responses than there are between some of the patterns discussed in earlier sections. This individuality of response is a key tenet of the constructivist theories of learning promoted by leading museum theorists (e.g. Hein 1998; Falk & Dierking 2000; Hooper-Greenhill 2007). Hein states:

That people make *their own* meaning out of experience appears to be a phenomenon of nature (not just a theoretical construction). There is overwhelming research evidence to back up our common-sense knowledge that exposure to any set of phenomena leads people to *different* conclusions. All of us interpret nature and society differently, depending on our own background and experience. (Hein 1998, p.34, my emphasis)

What I have chosen to refer to as ‘connecting’, Hein here calls ‘interpreting’, Falk and Dierking call ‘meaning making’ (2000, p.61), and Piagetian scholars might call ‘assimilating and accommodating’ (Boden 1985, p.16). What is key is that these are all active processes, involving the children personalising the information as they incorporate it into their understanding of the world. I have used the term ‘connecting’ following Rinaldi’s observation that learning is a creative process, connecting ‘thoughts and objects that bring about innovation and change, taking known elements and creating new connections’ (Rinaldi 2005, p.117). There is therefore a creative interplay between the children’s personal interests, personalities, prior experience and observations in the museum, which together form the context within which the children make sense of the things they are experiencing and encountering.

### *8.3.1 Connecting through observation*

It is of some interest to know the sorts of things that the children were able to discover from being in the museum. The above section on ‘categorising’ discussed the concrete aspects of the museum objects that the children noticed during their visit, and many connections lead on from this. Eberbach and Crowley (2009) suggest that ‘noticing’ is one of the key components in the development of scientific observation skills, and a small number of the children did appear to be using their observations of museum objects to discover new information about the objects on display (particularly the animals). For example, Bonnie discovered from seeing their skeletons that elephants don’t have bones in their trunks. However much of the children’s observation (or noticing) appeared to involve them describing known and general features of the objects (such as the cheetah’s spots), rather than using observations to make discoveries.

Where children did make discoveries or come to conclusions based only on their observations, these often related to specific aspects of the objects on display. For

example, Kyle discovered that he could see the tuna skeleton's tail through its mouth, and Daniel drew conclusions about the human skulls:

You can see the eyeballs, the nose and the teeth [...] But of course you can't see the neck cause it's sawed off.

The children's interpretations of the objects they observed could be quite literal, or could involve confusions about the museum objects as examples, versus objects as portraying general truths. For example the conclusions that Josh reached about dinosaur tongues (figure 35):

I didn't know that when they roar, their tongues come up. And I found that tyrannos ... that everything that roars, that are dinosaurs, that are meat eaters, their tongue sticks up like that. [...] they go straight forward and then it goes back up but it stays in its mouth.



*Figure 35. Josh's photograph of the utahraptor.*

### 8.3.2 *Connecting to experience and expertise*

As discussed in chapter seven, children appeared to be more likely to notice aspects of museum objects when they were familiar with them, a pattern that has been noted by previous researchers (e.g. Piscitelli & Anderson 2001). The outside connections that children discussed included school, television, film, books, magazines, toys, family pets, holidays, zoos and other museums. In total the children made 89 references of this type in the interviews, and the parents and siblings another 32. Only two interviews did not include mention of any connections of this sort.

When children made these connections during the interviews, they tended to use this outside experience (particularly from books or television) to connect a known ‘fact’ to the museum object, such as describing an animal’s typical behaviour. It was rarer for children to bring together their prior knowledge and their observations to make sense of some aspect of a museum object, and few seemed to seek information from the museum itself.

More often than doing intellectual work to explain museum objects, the children’s ‘facts’ reveal their own strong personal interests and the ways in which they personally connected to certain objects. Clara (5) was one of the children who was most interested in dinosaurs, and spent much of the interview looking through her dinosaur book. Unlike many of the children, she did not seem excited by the predatory dinosaurs, but rather demonstrated her knowledge in a very matter-of-fact way, and clearly took pleasure in her expertise:

- Elee: [...] What do you like about the tyrannosaurus?  
Clara: Cause it had brown bones.  
Elee: It had brown bones?  
Clara: Yeah, very old ones. [...]  
Elee: Is there anything else you can tell me about the tyrannosaurus, Clara?  
[...]  
Clara: Cause it has some teeth.  
Elee: It had teeth?  
Clara: Yeah, sharp ones.  
Elee: [...] Oh, why has it got sharp teeth?  
Clara: Um, because it eats other dinosaurs and meat.

Crowley and Jacobs describe children with particular personal interests as having ‘islands of expertise,’ which they define as ‘a topic in which children happen to become interested and in which they develop relatively deep and rich knowledge’ (2002, p.333), associated with greater than usual vocabulary, knowledge, schemas and memories that are numerous, well-organised and flexible (ibid., 335). Clara’s ‘facts’ about the tyrannosaurus show that, not only has she noticed the colour of the bones but she can explain this by their age. And rather than finding the sharp teeth scary, she can explain that they are like this because the dinosaur ate other dinosaurs (rather than children).

Another child notable for his personal experience and islands of expertise was John (4). He and his family had come to the museum because it had been recommended on his favourite television programme, *Deadly 60*, which is about dangerous animals. John listed and spoke about many of these animals during his interview. However, although he was enthusiastic about all of these animals, his area of expertise was, more specifically, ‘bugs’. For the ‘non-bug’ animals such as crocodiles, he was able to name them, said he liked them and that he had seen them on *Deadly 60*. However, when talking about insects and arachnids he was able to give facts, describe their behaviour, and make connections between them, as he does here, while talking about his photograph of the scorpion:

John: I love them, I’m really interested about them.

[...]

Elee: What do you love about the scorpion?

John: Because they’ve got venom.

[...]

Elee: Oh, venom! Oh my goodness. And what does venom do? What do they do with their venom?

John: They kill the other creatures with it.

[...]

Elee: So ... do you want to tell me anything else about this picture of a scorpion that you did? What can you tell me about it?

John: It looks like a spider.

Elee: It does look a little bit like a spider, doesn’t it? Did you think that when you saw it? Did you see any spiders nearby?

John: Yeah.

- Elee: But you wanted to photograph the scorpion?  
John: Yeah, and I took a few pictures of the spiders too.

Knowledgeable children did not only revel in their own knowledge, but were also drawn to observe and be curious about aspects of objects that they could not explain. Oscar was knowledgeable about prehistoric animals, and it seemed to be this knowledge that made him notice and wonder about specific details of the ichthyosaur:

- Elee: Is there anything else you can tell me about this?  
Oscar: Um, I wonder why it's got those kind of spots.  
Elee: You wonder what that is?  
Oscar: Yeah.  
Elee: [...] Have you got any ideas?  
Oscar: Um ... I cannot guess.

However, despite the fact that their knowledge prompted them to ask questions or to be curious, the children did not seem to be using the museum to answer these questions.

### *8.3.3 Connections between objects*

Eberbach and Crowley, discussing children's scientific observation skills, note that children 'tend to notice phenomenological features and events narrowly and do not spontaneously notice aggregates such as populations, distributions, hierarchical orders, or complex systems.' (2009, p.47). While it can be argued that the museum does not encourage the contemplation of complex systems, it certainly appeared to be the case that children's attention was generally narrowly focused on one object at a time. In spite of this, the museum itself is part of the context within which children make sense of objects, and a number of children did spontaneously make connections between different objects within the museum.

Most commonly, these connections took the form of comparisons between similar museum objects. So, for example, Marie (5) said she preferred the taxidermy crocodile because it had 'more colours', while the one without skin (i.e. the skeleton) was more 'scary'. Such comparisons were made by five children. Taking a somewhat different

approach, George compared objects which were different in type, but similar in shape, comparing dinosaur teeth with crystals and vice versa:

The teeth look like crystals [Triceratops]

That one, over there, looks like a shiny, see-through dinosaur teeth [Model diamond]

Two children, Kyle and Jack, used animals as proxies for other animals. Kyle chose to look at a photograph of the tuna, when he actually wanted to talk about the similarly-shaped ichthyosaur (the picture of which he momentarily lost), and Jack chose to photograph a small crab instead of the large spider crab because it could fit more successfully in the camera frame. However, Kyle was the only child who actually made conceptual connections between exhibits that were not next to each other. While looking at his photograph of the plesiosaur, he said he had seen the same type of reptile several cases away. Then he went on to say that he had also seen the animal that the plesiosaur ate, which was at the other end of this area of the museum:

Kyle: Yeah. An' I've seen... I've seen another... I've seen the teeth of it down in that... just down there.

Elee: So you've seen it's teeth as well have you?

Kyle: Yeah. I went down there and saw it and then I went up there and seen it.

[...]

Kyle: It's a dinosaur sort ... it eats... um... it was ... it was on these pictures but it's still there, it is, because I took a picture of what it eats.

Kyle's ability to make connections was particularly sophisticated, as he understood that the model and jaw plesiosaur represented the same animal, and also that there was a particular relationship between the plesiosaur and ichthyosaur. It is not clear whether the rarity of children making such connections is because of their ages and abilities, or because such connections are not encouraged by the presentation of information in museum.

### 8.3.4 Connecting museum animals to 'real' animals

There was a further response to the museum objects which I was particularly surprised *not* to find in the children. In my previous role as a museum educator I had become used to children frequently asking whether taxidermy animals were 'real' or 'alive' — a phenomenon which has been noted by other researchers (e.g. Ash 2004b, p.90).

Children appear to be unsettled by the nature of these animals, which sit on a boundary between being 'real' animals and being models, and which are dead whilst appearing to be alive. However, this question of 'realness' arose only once during the interviews with the children in my research, from Eloise, and she was very much led in this by her older sister, Amber. The following conversation occurred after Eloise had spent some time describing the crocodile:

Elee: Is there anything else you can think of to tell me about the crocodile?

Amber: We thought it was real, but ...

Elee: A real crocodile?

Amber: But we're not sure.

Elee: You're not sure if it's real?

Eloise: I know it's real.

Elee: You know that it's real, do you?

[...]

Grandma: I think I told you, didn't I Eloise, that I thought it was real.

Elee: Ah, so did you talk ... when you were going round the museum did you talk about whether the animals were real?

Eloise: Yeah.

This suggests that questions of 'realness' and 'aliveness' *were* being asked by the children in the museum, and indeed such questions arose in eight of the 90 observations. It may be, therefore, that when children are looking at photographs, instead of having a visceral experience of the actual, tangible animals, that questions of 'realness' or 'aliveness' do not occur to them. Alternatively, it may be that the children who were interested in this question had already had this conversation with their families and so were no longer curious about it. Or it may simply be that I did not ask the right questions to initiate this conversation.



*Figure 36. Fred's photographs of 'fighting' monkeys.*

While the photographs of the taxidermy animals did not prompt questions of realness, they did frequently prompt conversations about the animals' behaviour. These conversations took two forms: interpreting the animals on display as behaving in certain ways, and being prompted by seeing the animals to recall knowledge about animal behaviour. An example of interpretation can be seen in the following conversation with Fred (figure 36):

- Fred: A monkey with skin on.  
 Elee: A monkey with skin on? Ah. And why did you take this picture?  
 Fred: Because it looks like its going to fight that one.  
 Elee: Oh, so that's the monkey that's just ... what's this one?  
 Fred: The monkey that is a skeleton.  
 Elee: So the monkey with skin looks like it's going to fight the monkey that's a skeleton?  
 Fred: Yeah.

Reiss and Tunnicliffe (2011) have argued that dioramas in natural history museums encourage visitors to tell stories and imagine the behaviour of the animals they are viewing. The museum in Oxford has only a few very small dioramas, with most of the animals being displayed on individual shelves in cases, and so it is perhaps unsurprising that few children interpreted the behaviour of animals in this way. When they did so it was either because animals happened to be positioned close to each other in such a way as to appear to be interacting, or because they were positioned with 'props' (e.g. a branch or some eggs), or because they were in one of the dioramas. Of the 19 instances

of this type of discussion, from 10 children, 6 came from Fred, who was particularly disposed to interpret the exhibitions in this way.

Even interpreting behaviour from dioramas appeared to be a struggle for some children. In the following conversation, Karen's father is encouraging her to interpret the behaviour of a polecat and moorhen, but in spite of his somewhat successful scaffolding, her own focus remains much more on the individual elements of the scene than in piecing them together to form a narrative (figure 37):

Elee: Ok, so it's sort of a long thin animal isn't it? In a glass box. So why did you like this one?

Karen: Cause I liked the long tail.

Elee: You liked its tail? Did you? What do you think it's doing?

Karen: Um... climbing up... climbing up the rock to get some food.

Elee: Oh, what do you think it eats? [...] Do you know? No? Ok, so what else do you like about this?

Karen: Um [...] Because... because it, it has flowers.



*Figure 37. Karen's photograph of a polecat.*

Elee: You like the flowers in it as well do you? Ok. So you like this animal here because of it's long tail.

Karen: Yeah. Yeah, and I like the duck.

Elee: Oh, there's a duck down there as well. I didn't spot that. Well done. You've got sharp eyes haven't you? So you like it...

Father: Maybe it's going to eat the duck.

Elee: Do you think it's going to eat the duck?

Karen: It's looking at the duck. So I think [...] I think he's going to eat the duck.

Elee: Oh, so it's looking at it so it can eat it? Oh, ok. Wow. Do you want to tell me anything else about this picture?

Karen: Um... because I like his long whiskers.

Elee: You like his whiskers? [...] So you like his whiskers and his tail, and the flowers...

Karen: And the flowers and the duck.

More common than the children *interpreting* behaviour was them being prompted to *recall* their knowledge of animal behaviour, which accounted for 37 of the 56 instances of behaviour-based comments. These consisted either of isolated 'facts' about the animals, such as saying that a particular animal flies, swims, makes a particular sound or eats meat, or of bringing together observations and knowledge to demonstrate a deeper understanding of the animal's form and behaviour, as Haden (4) does below (figure 38):

Haden: The blow fish.

Elee: You want to look at this one as well? [...] so what can you tell me about this one?

Haden: It's got spikes all over it.

Elee: [...] Can you tell me anything else about it?

Haden: It can blow up.

Elee: It can blow up? Can it? So is this what it looks like when it's been blown up? It's blown itself up? Why do you think it's got spikes on it?

Haden: To keep itself safe [...] From the sharks and the animals under water.



*Figure 38. Haden's photograph of a pufferfish.*

Haden shows that knowledge about animal behaviour can help children to understand the purpose of animals' features. The children were interested in animals' behaviour, but, again, their understandings of animal behaviour were not gained from the museum, but from television or books, which they recalled as they looked at the animals. It may, however, be that the children's prior knowledge about behaviour was consolidated as they looked at the animals in the museum and were able to inspect their physical features at closer quarters and in three dimensions.

### *8.3.5 Creative connections: children's misunderstandings*

While Haden used his knowledge of animal behaviour to consolidated his understanding of the fish's shape, Amar attempted to devise his own explanation to make sense of the deinotherium's tusks (which he refers to as an elephant, figure 39).



*Figure 39. Amar's photograph of an 'elephant'.*

Amar: Uh, the big tusks, um, they were used for digging up trees [...] and digging for potatoes.

Elee: Are they? Is that what the elephant used them for?

Amar: No.

Elee: Who used them?

Amar: The people. They used to break the tusks off.

Elee: Did they? [...] How do you know about that?

Amar: Because the elephant can't do it, otherwise it might get ... otherwise, if it gets its tusks stuck in, that means the elephant [...] that means its body will get stuck and it won't be able to move anywhere.

Elee: Oh, that wouldn't be any good, would it?

Amar: So that's why only, so that's why the people use them. They break it off.

Gardner says of young children's developing understandings of the world:

[their] understandings may of course be deficient... but they are typically not the result of either rote memory, sheer imitation, or simple guessing. In fact, they often involve chains of inferences, which devolve from the basic tenets of the theory or theories on which the child is drawing. (Gardner 1993, p.98)

Amar was not alone in revealing misunderstandings about the museum objects, and yet, as Gardner suggests, these mistakes were not random, and show something of children's developing understandings of the objects they encounter. So, for example, John wrongly says that ants have more legs than spiders, but this shows that he understands one of the differences between spiders and ants to be that they have different numbers of legs.

Four of the children made mistakes in their interpretation of eggs. Anna and Eloise both thought that bird eggs were dinosaur eggs, and Harvey made the same mistake with crocodile eggs. This simple mistake does however show, firstly, that the children knew that dinosaurs laid eggs, and secondly, that museums are places where one expects to see things associated with dinosaurs. Somewhat differently, Josh interpreted a clutch of fossilised dinosaur eggs as being tyrannosaurus 'poo' (figure 40). But again this shows that he knew about coprolite and was using this knowledge to interpret the eggs.

Amar was the child who made the most effort to explain the things that he did not understand, and whose interview involved a number of inferences, rather than simple displays of knowledge. He also inferred why the crystals in the dark booth were glowing:

Cause they, it was in a dark room so they had to glow so people could see them.  
[...] Cause if it was dark then they wouldn't be able to see the crystals.

For a child with no knowledge of the effects of ultra violet light on fluorescent materials, Amar's explanation makes sense, and shows, as do the misunderstandings and misinterpretations of other children, that he is creatively working to get to grips with this and other phenomena in the museum.



*Figure 40. Josh's photograph of 'dinosaur poo'.*

#### **8.4 Chapter conclusion**

As the children explored the museum (chapter six) and were drawn to particular objects within it (chapter seven), so they went on to make sense of the objects that were most salient to them. This process followed a familiar pattern in which the children began by categorising objects through naming and/or describing, and only sometimes went on to make connections to past experience, existing knowledge, or new concepts (Laetsch 1982; Taylor 1987; Borun et al. 1996; Tunnicliffe & Scheerso 2009). The ways in which children named and described the objects revealed their developing linguistic skills, and also hinted at gender differences between the ways in which children focused on the objects. Children's connecting of the objects to other elements of their lives and knowledge were much more idiosyncratic, and has therefore been discussed more selectively. What was clear, however, was that the children were not generally using the museum to gain new knowledge, but rather were linking their experiences of seeing the physical museum objects in the flesh to their own existing knowledge and experience.

The focus of this research has been on the children's museum experience in the moments that they are in the museum. It has been on the children as *beings*, rather than as *becomings* (Qvortrup 1987, p.5). Yet this focus is not incompatible with Dewey's (1938/1998) notion of educational experience as a process of 'growth', in which experiences can be judged on their potential to open up new experiences. And while the discovery of such experiences may be the remit of more longitudinal and learning-focused studies than this, throughout the interviews, and particularly in the children's processes of 'connection', there was necessarily a sense of the children and their families tying their museum visit into their wider lives: relating it to past and sometimes planned future experiences, using it to consolidate existing knowledge, being driven to discover new things, building their identities as enthusiasts and experts in certain subjects, gaining confidence and independence, and becoming familiar with what museums are and how to use and enjoy them. Through a focus on the minutiae of a group of children's experiences, this study has thus revealed how their museum visit is one small part of the children becoming experienced.

## Chapter 9. Conclusions

This thesis set out with the linked aims of investigating young children's experiences of a natural history museum and developing a research method that would explore these experiences more broadly, rather than specifically through the lens of learning, which, as chapter two has shown, tends to be the focus of research in this area. The distinctiveness of the method developed is in providing a way of investigating the texture of children's experiences within a museum at the time of their visit, which highlights both patterns across a group and also the uniqueness of the individual children. In doing this, the thesis adds substantial weight to the growing body of research that shows that it is possible and worthwhile to gain young children's viewpoints in museums, and that these children should be taken seriously as an audience, and not only as learners. The process of developing this method has also demonstrated the importance of matching the method to the participants as they are in the setting. The findings corroborate and add to the wider field of museum visitor research, particularly by providing an original, broad and deep case study of young children's perspectives and experiences within a single museum. Findings also add to the field of childhood studies by showing aspects of children's everyday experiences within an important out-of-school setting. This thesis will therefore be of interest to museum educators, museum evaluation practitioners, natural history curators, and education and childhood studies researchers and theorists.

### ***9.1 Discussion of photo-elicitation as a method***

The first section of chapter nine will draw conclusions regarding the potential of photo-elicitation as a research method with young children in museums. This research was developed for a particular group of participants in a particular museum and the findings suggest that methods are not as directly transferrable between settings or participants as is sometimes assumed. It may be, for example, that in Oxford University Museum of Natural History the museum's medium size, open layout, unusually high levels of daylight, or high average levels of visitor education and confidence make it

exceptionally well suited to such photography-based research. However, the fact that Dunn (2012) has used a very similar method of digital photography and photo-elicitation within a different museum, suggests that the method may have potential for use within other institutions.

Cosgrove and Schaverien contend that during research ‘children choose to reveal (or not to reveal) what they know and that they will make opportunities for disclosure, given favourable circumstances’ (1996, p.114). While the time the children spent taking part in this research was relatively short, being able to view their photographs did appear to create favourable interview circumstances within which children were happy to talk about their experiences of the museum. Working in educational settings, Einarsdottir (2005, p.527) describes a number of advantages of using photography with this age group, including that it is empowering for the children, forges trust between the researcher and child, focuses on their perspectives, allows both visual and verbal expression, and is active, enjoyable and quick. This project shows that within museum-based research there are additional advantages relating to the specific characteristics of museums, including that photographs prompt memories of a less familiar setting, and that photography is an everyday activity within museums.

### *9.1.1 Empowerment*

Hreinsdottir & Davidsdottir (2011) have argued that researchers need to take steps to reduce the power imbalances in discussions between children and adults, and Piscitelli et al. (1998, p.78) suggest that young children can often lack confidence when speaking to researchers about museum visits. This photography-based method both empowered the children and forged trust between them and myself as researcher. As Marcus et al. also found: ‘[t]he fact that [the children] were given cameras [...] indicated the trust vested in them by adults and raised the status of the whole experience’ (2009, p.19). The children’s trust and confidence may also have been increased by the additional time they had between their recruitment and the interview, which allowed them to become used to the idea of talking to a stranger, and meant that they were much less intimidated than the children with whom I piloted drawing and tour-based interviews. It is also possible that the presence of the child’s own photographs increased their confidence within the interviews by drawing their attention away from me and towards the products of their own activity.

The children had a high degree of control within the research: over the camera, over what to photograph and how many photographs to take, and over which photographs to discuss, all of which meant that the interview took on a much more child-led and less didactic tone than might otherwise have been the case. Children also exerted control through the power of dissent, by which they could refuse to participate or could end the interview. In all, 12 children curtailed their interviews. This was sometimes very deliberate, such as Caroline, who got up and walked away after ten minutes, and sometimes because the children lost energy or focus, for example Irena, who ended the interview by saying that she was tired. An important part of this research has been to take the communications from the children seriously, and their dissent was built in to the ethical framework.

### *9.1.2 Children's expression of their perspectives*

As has been noted previously, photography is highly effective at providing children's perspectives. This is in part due to the control outlined above, but more specifically because, as Mizen states, 'cameras visually place the viewer in [the children's] shoes' (2005, p.132). However, the analysis of the research findings showed that family members were highly influential both during the visit and often during the interview, and this has the potential to undermine the research aims of gaining insights into the children's perspectives and experiences. Nevertheless, I would argue that this social influence was representative of the children's museum experience more broadly, and therefore, as long as the focus remained largely on the child, the family influence does not diminish the integrity of the work. In addition, there was evidence that photography could capture aspects of the children's experience that were unknown to family members. An example was Jack's father, who was surprised by Jack's photograph of a seed pod, which, in spite of the pair's closeness during the visit, Jack had photographed without his father's knowledge.

This gaining of perspectives was carried out through the use of both visual and verbal methods. This approach does not simply provide two alternative forms of expression. Rather, as Edwards states, 'photographs both focus and extend verbalization' (2010, p.26).

This combining of visual and verbal expression was not, however, straightforward, and the children's use of the camera was as idiosyncratic as their

museum visits. Some of them took only a few pictures, or were uninterested in the camera, or struggled with framing their images. In the Mosaic Approach, Clark and Moss argue that one of the advantages of providing a wide range of methods is so that individual children can express themselves in ways that draw on their individual strengths (Clark & Moss 2011, p.6). It may be that this method favoured children who were already skilled and experienced with cameras, without providing an alternative for children who did not take easily to the technology. I would, however, argue that the short time of a museum visit does not allow for the multiple methods of the Mosaic approach unless the research extends or continues after the visit, and hence, of the three options tested, photography was the most usable by the majority of children. Unlike drawing, a very low skill level is needed to give photographs that could be identified by myself and the children, so although many of the photographs are a little out of focus, almost all are intelligible, and some are very good.

The verbal aspect of the method also challenged some children, who found it hard to explain their reasons for taking photographs. Four-year-old Ally spoke very little, and, after seven minutes of giving one word answers to my questions, she suddenly wailed ‘they’re so hard!’. Children are still developing their language skills, and certain aspects of their experience are difficult for them to express in words, particularly those that are not in themselves verbal, such as physical sensation or emotion. In spite of this, it appeared that for most children their photographs allowed non-verbal insights into their visit whilst also encouraging them to speak about many different aspects of the experience.

The success of this method for children’s expression was in part because they generally engaged well with photography as an activity (Stephenson 2009). The children enjoyed the activity, to the extent that many parents thanked me for allowing their children to participate. Dockett et al. (2011) suggest that the novelty of using cameras is part of what makes them more enjoyable for children, compared to more familiar school activities such as drawing. The satisfaction of photography may also have been because, as Finnerty suggests, it allowed ‘choice within reasonable parameters’ (2005, p.12) and thus was neither too open to be baffling, nor too closed to be dull.

Photo-elicitation also provided data that went beyond the children’s own perspectives, and that added broader context to the understanding of their museum experiences. This was achieved through the children photographing other visitors —

both intentional photographs of family and (in most cases) unintentional photographs of strangers. As Mizen notes, adults tend to be at their ease confronted with a child behind a camera (2005, p.135), and indeed many of these pictures show other visitors behaving naturally within the museum. The photographs therefore provide data not only about the children's experiences, but also a degree of information about the behaviour of the visitors around them. In this way the data spills out beyond the children.

### *9.1.3 Prompting memory*

As stated above, some of the advantages of photography in this research relate specifically to the characteristics the museum setting. One of the challenges of working in a museum is that, unlike school or home, children do not generally visit regularly, and so can find it harder to remember aspects of their visit. In addition, museums are large and varied environments, with a huge amount of content for the children to experience and therefore to recall.

While this research does not focus on children's longer-term memories of the museum, their immediate short-term memories of their visit were vital. And while it was evident from the interviews that the children struggled to remember certain aspects of their visit, being able to view their own photographs appeared to be a highly effective prompt for their memories by providing concrete reminders of their visit. As well as individual pictures, seeing the grouped thumbnails of their photographs on the laptop screen provided the children with a personalised summary of their visit, which made the whole experience more concrete to them and so easier to remember (Hatch 1990, p.262). In addition to the photographs directly prompting memory, the act of having taken a photograph also appeared to be memorable, even when the photograph in question was not being viewed. This was evident when, during the interviews, children tried to find photographs they remembered having taken. As well as the photographs, the methodology also allowed input from other family members, which prompted the children and added further data.

This effective prompting of memory meant that the children were able to recall and express their interest in the smaller and less charismatic objects in the museum, which often do not feature in such research. In addition, as Edwards (2010) has discussed, photographs can be a visual route into powerful sensory and affective memories, and the children also talked about the many different ways in which they had

touched, discussed and emotionally responded to objects. It should, however, be noted that the children may in some cases have been responding to the photographs, rather than to the objects themselves, although a degree of overlap between such responses would be expected.

#### *9.1.4 Making 'human sense'*

I was aware when planning this museum-based method that the approach used would need to make 'human sense' to the children (Critchley 2003, p.57) — that it would need to be familiar or intuitive to them. What the pilot studies showed was that an activity (such as drawing) could be intuitive to children in school, but not in a museum. Photography, on the other hand, surrounded the children in the museum, with visitors of all ages using cameras to record their visit. Therefore, being asked to take photographs themselves was more likely to make sense to the children. It is also usual to share and talk about photographs after a visit (although less usual to do so in the museum), so asking children to discuss their pictures fitted further with their expectations. In essence, photography 'resonate[d] with children's own concerns and routines' (Christensen & James 2000, p.7). The method also fitted with the logic and pace of a museum visit. Participants were recruited as they entered the museum and taking photographs fitted easily with the pattern of their visit — not so much interrupting it as adding an additional layer. In addition, the research placed no demands on the visitors beyond the end of their visit.

This marks a fundamental difference between using cameras for research in museums and doing so in schools, as cameras are already an everyday piece of equipment in museums, with an existing 'script' to dictate their use, upon which the research can 'piggyback'. Ways of working with a camera in a museum are implicit, rather than being explicit as they are in situations where cameras are not typically used. In practical terms this means that children can take a camera and complete the task immediately, without having to have the task explained in detail.

The 'everydayness' of museum photography is suggested by the fact that, as well as the children photographing things they 'liked or found interesting', they also enacted tourist photographic practices by taking photographs of family members posing with exhibits. Noting a similar occurrence, Fidler et al. suggest that this happens because taking photographs of people is a 'familiar use of cameras' that the children see being

carried out by adults (2011, p.42). Given that this type of family photography had occurred, it was therefore surprising that families did not ask for copies of the photographs. This may have been because the pictures were taken for the purposes of a research project, because the children's photographs were not valued to the same extent as adult photographs, or because the activity was rewarding enough in itself.

A disadvantage of photography for accessing children's everyday museum experiences is that through the addition of the camera, children will have experienced the museum differently. It is not possible to judge quite how big this difference is, although there is some evidence that the camera reduced the children's desire to touch objects, and that it affected social relations with other members of the group. This impact may have been smaller for the children who were familiar with cameras than for children unused to using cameras. However, it may also be that photography's 'everydayness' in museums actually lessened its impact on the visits.

More broadly, through reflecting deeply on questions of methodology, this research has added to the understanding of the use of different research methods within varying settings. In particular, through the failure of drawing and tours to produce rich data about children's museum experiences this thesis has shown that methods that have been useful in schools and other environments in which children spend most of their time are not necessarily usable with the same age group in museums. This outcome strongly suggests that researchers should consider the ways in which their methodologies fit with children's expectations and behaviours in the settings in which the research is taking place.

## ***9.2 Discussion of findings***

Over a decade ago, Piscitelli and Anderson (2001) lamented the lack of research into young children's museum experiences. This research adds to the growing body of work into these experiences by showing the perspectives of a number of children within one museum in the UK. Although this research started from a position of open enquiry and has not attempted to evaluate which types of programmes or exhibitions 'work best' for young children, there are a number of specific outcomes which will be of relevance to both researchers and to museum professionals. The usefulness to museum professionals is achieved partly by assisting them in responding to the suggestion from Pattison and

Dierking that they ‘need training and mentoring that focuses on noticing and responding to the nuanced behavior of families’ (2012, p.78). And as Gurian states:

Appropriate content for the very young is different from that for the middle-aged elementary school child (who reads, has skills, and has considerable independence). Yet even that content needs to be expanded to accommodate what we increasingly know about learning in the very young. (Gurian 2006, p.30)

This research gives museum professionals insights into some of young children’s strategies for engaging with a museum using their own skills and with their own levels of sociality and independence.

### *9.2.1 The view of young children in museums*

More specifically, this research adds to the literature on children’s museum experiences by expanding or shifting the lens through which children are viewed within museum studies. As has been shown in the literature review, research with children in museums is heavily predisposed towards focusing on children’s learning outcomes. While this thesis is aligned with a constructivist view of museum learning and experience, in which visitors actively make sense of the museums they visit (Hein 1998; Falk & Dierking 2000; Hooper-Greenhill 2007), it has also been open to broader aspects of the experience. In doing so, it does not seek to deny the place of learning in children’s visits to museums, or to say that it is not part of their own agendas, rather it sees learning within the bigger picture of what visiting a museum is like for the children.

This openness has been achieved in part through a focus on the immediate experience, rather than using a method that returns to the children some time after their visit. This immediacy has revealed more about the broader and deeper texture of the visit, rather than the specific aspects of the experience that are most memorable to visitors once they have left the museum, and that are therefore judged to have been successfully incorporated into their learning. Methods that focus on memory and learning tend to show that children’s most salient museum memories are of large, charismatic, familiar objects that they are able to link back to their previous experience (e.g. Piscitelli & Anderson 2001, p.276). While this research has corroborated this pattern, it also shows the significance to the children of the less obviously memorable

aspects of the museum. These may be important for creating the atmosphere and particular experiential environment within the museum, or may be unfamiliar and so harder to remember, but are expanding the children's range of experiences and their sense of the stuff of the world.

In accordance with the learning-based literature, this research has also suggested that children tend to use their everyday knowledge to make sense of museum objects, rather than developing new understandings from the museum (e.g. Tunnicliffe & Reiss 2000, p.136). However, by taking the children's perspective it seems that what they actually get from museums is a deeply embodied experience that they can build in to their existing understanding of the world. This does not have to involve new information or concepts, but it does involve a deepening and consolidating of existing knowledge. For example, the children interviewed knew before their visit that predatory dinosaurs had sharp teeth, but their encounters with life-sized skulls and models deeply impressed on them *quite* how big and sharp those teeth were. Discovering the softness of feathers and fur, or the hard shininess of crystals adds to children's visceral understanding of animals and minerals that they may only have seen in books or on screens before. And coming face-to-face with favourites may deepen children's self-identity as animal, nature or geology-lovers. Looking at children's experiences through their eyes (or at least through their photographs and words) gives an idea of the personal value of the museum experience to the children, even where they have not come away from their visit with what might be judged as new scientific knowledge.

### *9.2.2 Insights into young children's museum experiences*

Even though I have, in this work, chosen to move away from viewing children through a learning lens, I do believe that museums should be places in which children can expand their experiences of the world and grow as learners. However, I suggest that in order to do this it is important to go beyond particular convictions about the types of learning that we as practitioners (researchers, educators and curators) consider valuable, and to understand the aspects of the museum experience that are most valued by the visitors. Pekarik et al. suggest that '[u]nderstanding how others differ from ourselves can make us more humble and more open in considering what to present and how to present it.' (2014, p.18). And more specifically, Piscitelli and Anderson state that research into young children can,

inform museums communities about the experiential aspects which children find most rewarding, and assist in the developmental aspects of exhibitions and programs which have educational and experiential impact for young visitors' (Piscitelli & Anderson 2000, p.3).

The children's own perspectives on the value of museums can therefore be seen as the vital half of the equation for creating worthwhile museum experiences (exhibitions and programmes) which is often neglected within the literature.

Throughout this thesis I have promoted the concept of understanding the texture of the museum experience, including all aspects of the museum objects, building and other visitors that add to this experience. This resonates with the conclusions of a visitor survey of people visiting UK museums with natural science galleries, in which consultants Jenkins et al. suggest that the, 'variety of scale and the appeal of very large and very small objects found in natural sciences galleries are [...] features that can be exploited when promoting the 'something for everyone' appeal of these galleries' (2013, p.42). My research has revealed objects of all scales that appealed to young children, including many small objects such as ammonites, eggs, crystals and insects. While there are certain objects that seemed to have almost a universal appeal (for example the tyrannosaurus), the variety of objects that the children noticed and discussed was impressive, to the point that each child can be seen to have experienced a different museum.<sup>26</sup>

The findings also reveal that while young children did seem to value the museum's handling collections, this may in part have been because of the types of objects or the closeness afforded by this mode of display, as the children often did not touch the objects. In spite of the appeal of handling collections, the children were also found to be very aware of the objects in glass cases, which they viewed actively as they moved around and between the cases, squatting, stretching, leaning and pointing at the objects. The patterns revealed in this research are of children's attention within one museum, but this demonstrates the value of other museums exploring the ways that visitors of all ages attend to all aspects of the museums' own collections and modes of display.

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<sup>26</sup> A suggestion about museum visits that I have made previously (Kirk & Buckingham 2013).

The research with young children in museums reviewed during this thesis reveals varying degrees of interest in features of museum objects and modes of interaction, including interest in colour, touch, play, storytelling and so on. It might reasonably be assumed that different museums and collections stimulate children in different ways, and this highlights the importance for practitioners of understanding the different types of learning that may generally be associated with specific collections. So while social history galleries may generally be more conducive to pretend role play, natural history galleries seem to be less places of storytelling and make-believe, and more places in which young children ‘collect’ through vision and touch the many objects and animals of the natural world and add these things to their mental maps or catalogues.

Eberbach and Crowley highlight the importance of museums for allowing children the ‘time to look’ and develop skills in observation (2009, p.60). As well as providing an atmosphere conducive to such observations, it is also important that museums provide the information that children and their parents want from the galleries. This has most particularly been shown to be the names of specimens (and, I would suggest in the case of more complicated names, pronunciation guides).

One of the areas of disparity between the interview data and the observations was in children’s responses to the question of whether the animals in the museum were ‘real’ or ‘alive’. This disparity adds to our understanding of how children make sense of this subset of objects that they encounter in museums, suggesting that it is only when faced with the three-dimensional object itself, rather than a photograph, that a concern with ‘realness’ arises in the children.

This research has also reinforced the suggestions from other researchers that cameras, as well as being enjoyable to use, can help children to engage with the museum collections (Lemon 2013b, p.237). Fidler et al., suggest that photography can provide young children with an active way in which to engage with galleries that have not been designed with this age group in mind, and that using cameras can bring about ‘similar positive effects to those evident from being able to touch objects’ (2011, p.46). And Graham suggests that such tools encourage conversation between families, as they ‘act as a non-verbal indication of children’s interest for parents’ and ‘tended to focus the family interaction on the museum collections or buildings with both parents and children talking about what they could see’ (Graham 2009, p.7). Certainly children’s photographs showed their potential as a talking point within the interviews, with some families even telling me about the conversations they had had about the child’s

photographs during the time of the visit. With digital cameras becoming more ubiquitous, there must be increasing potential for museums to make use of this technology with even their youngest visitors.

### **9.3 Limitations**

Although I have argued for the benefits of a light-touch method that focuses on children's experiences of the museum at the time of their visit, there are a number of limitations to this approach, some of which might be overcome in the future by adapting the method, and some by drawing together these findings with those of other projects.

It was decided from the outset that contact with the visiting children would not extend beyond their visit. This has meant that the research does not show the ways in which children extend their museum experience beyond the museum itself, to give what might be called a more 'ecological' perspective (e.g. Zapri 2007). Had the research involved continued contact with the children it could have shown both the place of the museum within their lives, and even the ways in which they make use of their photographs after their visit (Cook & Hess 2007, p.42). In addition to this, Stephenson has argued that it is only through ongoing contact with children that the nuances of their individual perspectives become apparent (2009, p.132). Had I known the children better before their visit, there would certainly have been additional aspects of their experience that would have been apparent to me, and thus my interpretations of their discussions and photographs would have been made within a wider context.

Even within the time-frame of a single visit there were possibilities for further data collection which were not undertaken, as a way of reducing to a minimum the impact that the research had on participants' visits. For example, I chose not observe the participating children during their visits, and can therefore only depend on their own accounts for information about the depth and nature of their engagement with the museum. It may be that the quieter children gave an impression of a less rich engagement with the museum than the more articulate children, but that this was not actually representative of their visits. I have argued that the photographs both allow a non-verbal form of expression and encourage verbal expression, and that family members add to the children's own accounts. However, had I accompanied families on their visits, the fine details of children's experiences might have been more apparent.

Instead of observing the participants, I chose to observe other visitors to compare their experiences with those of the participating children, and have therefore had to make the assumption that the visit experiences revealed in these observations are equally as representative as those of the participating children.

As well as not observing the children, I also chose not to collect any information from the families beyond their contact details, which limited the possible analysis of the sample. I did not, for example, ask about the education of the children or parents or about the families' socioeconomic status. Falk (2009), however, argues that these types of information have actually been found to say very little about the experience that visitors have once they are actually in the museum, and it may be that the inclusion of such data draws attention away from the finer details of children's experiences of the museum.

While I have argued that photo-elicitation was particularly well suited to the research requirements, the rejection of alternative methods is a potential limitation of this research method. As discussed in chapter three, multi-method research such as the Mosaic approach has been highly influential in childhood studies, with the value of children's expressions being seen to increase when multiple modes of expression (or pieces of the 'mosaic') are viewed in combination with each other (Clark & Moss 2001, p.54). Working within this approach, Stephenson argues that it is 'precarious' to base conclusions about children on a single form of data (2009, p.137). However, Silverman suggests that mixed methods can be associated with a lack of research focus (2010, p.64), and indeed, within this study photo-elicitation appeared to allow the production of broad and rich data even within a narrow methodology. In addition, the 'precariousness' is to some extent circumvented through the drawing together and comparison of findings from other research projects.

In addition to the broader issues with the methodology, with hindsight I have become aware of the shortcomings of my own developing research skills. In particular, while a loosely-structured and conversational interview technique was appropriate to this research, a review of the transcripts suggested that my style could have been more effectively standardised to allow easier comparison between the data. It was also noticeable that certain ways of questioning the children were more effective than others, which meant that some interviews were more successful than others in encouraging the children to discuss their experiences. So, for example, an effective question for opening a discussion about a photograph might be, 'Why did you want to look at this picture?',

which is more open than ‘What is this?’ and less dependent on children’s recall than ‘Why did you take this?’. For the purposes of comparison it would also have been useful to have had a standard list of questions to ask the parents before the start of the interview with the child, covering, for example, how often they visited museums, whether they had been to this one before and so on. I do accept, however that, as a researcher-in-training, it is only following the deeper analysis of the data that I am able to reflect on my own techniques and choices and see the impact these had on the production of data.

A final limitation that may be shared with qualitative museum research generally, is the impossibility of fully capturing the variety of visitor experience. As McManus states:

[H]uman behaviour is extremely complex when looked at second by second and, as a consequence, the analysis of behavioural data is very time consuming. This means that the sample sizes and numbers of events investigated in studies are typically very small in number — often around twenty-five families at perhaps three or four exhibits — so that we have to piece together a picture... (McManus 1994, p.96)

Each study therefore sets its own limits of what it being studied and what is being left out. My own approach very much echoes Cosgrove and Schaverien’s insight that, ‘we can watch a ball rolling across the floor and gather a great deal of information or we can take snapshots of its position over time and benefit from selecting information about its journey’ (1996, p.115). As stated in section 5.1.2, in the case of this research these ‘snapshots’, both literal and metaphorical, allow the capturing of moments in particular children’s visits to the museum, giving data that is both rich and manageable. In addition, while this study is not entirely generalisable to other children and museums, nevertheless I argue that, taken in association with other research studies it adds to the body of knowledge about this age group in this type of setting.

#### ***9.4 Possibilities leading on from this research***

There are a number of additional research questions and possible variations on the methodology which are suggested by the findings of this thesis. The most immediate of these are further analyses of the existing data, which could potentially be used to address more specific questions, such as children's engagement with photography;<sup>27</sup> more about the specific characteristics of objects that seem to attract them; or a closer analysis of the attention they give to exhibitions styles, for example by looking at the height and closeness of their photographs in relation to the cases and objects. It would also be possible to plot children's individual routes through the museum by looking at the order in which they took their photographs.

The methodology developed during the course of this thesis has the potential to be used in other settings. As stated in chapters 3 and 4, methods need to respond to the needs of a particular group of people within a particular setting, and so, whilst this method could inspire or influence similar methods, it is unlikely to translate directly into another museum. There may, for example, be practical issues with the light levels or the amount of time that visitors spend in the museum. In spite of this, variations of this method have the potential to give information (as it has here) both about the aspects of the museum to which young children pay attention, and the ways in which they personally respond to these things.

As well as being used in other museums, this method could also be tested with other age groups. It would be interesting to compare the responses of older children or adults to those of the young children who took part in this research. It might, for example, be that older participants are more concerned with their photographs being used in research, are more self-conscious about the subjects of their pictures, or are unwilling to participate because they are already taking photographs with their own cameras or smart phones. There is also the possibility of using the method with younger children, as three or even two-year-olds might be willing to participate as long as they are familiar with the researcher. Further studies using this methodology could also test it with a larger sample size, to give an impression of visitor attention that is less affected by the variation between individuals. The mapping of the photographs would benefit

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<sup>27</sup> A question which I began to address in a paper entitled 'Budding photographers: Young children's uses of cameras in a museum' at the Royal Anthropological Institute conference on Anthropology and Photography, London, 2014.

particularly from such an approach. Alternatively, the technique could be used with a smaller sample size but a deeper involvement with the visitors.

This method also has the potential to be adapted as an evaluation or consultation tool, as well as being an open research method as it has been used here. In particular, the fact that visitors take part only during the time of their visit means that this method is logistically more straightforward than those which depend on following up visitors after their visit, and may therefore be of more use to museum staff. The mode of photo-elicitation employed in this thesis could be used in conjunction with more direct prompts and questions to uncover visitors responses to specific aspects of museums, such as particular exhibitions, programmes, facilities or buildings.

As well as variations in the methodology, this research suggests further research questions that future projects might address. The findings strongly suggest that research into children's and parents' notions of fear and safety in museums could be of interest, for example testing the hypothesis that museums are considered by families to be safe physical spaces in which children can push the boundaries of their independence and even confront their fears. The research also suggests further questions regarding the connections that children make between the museum and other aspects of their lives and whether, for example, they are more likely to draw connections between the museum and experiences from home or from school (i.e. between other informal or formal learning). There is also currently much concern with children's 'nature connectedness' (Kahn & Kellert 2002; Louv 2009), and the findings of this research could feed into future research investigating the ways in which urban children connect to nature through natural history museums.

I also suggest that there is further potential in two of the theoretical approaches developed within this thesis. Firstly the experiential model that was developed to structure the analysis section may be of use to other museums or researchers wanting to move away from a more heavily learning-focused view of museum experience. And secondly, the metaphor of snapshots may be of use to museum researchers or evaluators wanting to gather deep experiential data about their visitors. Both the experiential model and the metaphor of snapshots would benefit from further theorising.

Finally, the findings of this research show the value of using methods that are closely aligned with visitors' expectations of and behaviour within particular settings. It may be that this insight leads to the development of research methods that uses tools other than cameras, in settings other than museums.

This research has shown that it is worthwhile taking children's museum experiences seriously as experience, rather than only as learning, and that through sensitive and appropriate methodologies these experiences, often unknown or unappreciated by adults, can be brought to light. Such an approach can give rise to new questions and new ways of working, born out of the concerns of the children themselves.

## **Appendices**

## ***Appendix 1. Definitions***

**Family:** Non-school group visiting a museum, generally made up of relations and friends. Groups who have chosen to organise their visit for themselves, rather than visiting as part of a larger organisation such as a tour. They therefore have their own, personal agendas and control over the timing of the visit.

**Mosaic approach:** A consultation method developed by Alison Clark and Peter Moss (2001) for working with young children in educational settings. The approach uses multiple forms of data collection, including children's drawing, tours, photography, and interviews with both children and practitioners. Each of these is seen as pieces of a 'mosaic' that add in different ways to the overall picture of the child's experience of the setting from their own perspective.

**Photo-elicitation:** An approach to conducting interviews in which photographs are used as part of the prompt to elicit verbal answers. In the case of this research, the photographs used are the participants' own. I have extended the concept of photo-elicitation to refer to interviews involving children's drawings and tours as 'drawing-elicitation' and 'tour-elicitation'.

**Reggio Emilia approach:** A pre-school educational approach developed within the Italian town of Reggio Emilia, which makes use of an emergent, child-led curriculum and a form of feedback and review called 'documentation', in which teachers and children together reflect on the children's work and recordings of their lessons. The approach has been highly influential within early childhood education for the past three decades.

**School:** Organised and formal educational groups, including schools, nurseries, etc.

**Young child:** In the case of this research, a child older than a toddler and under the age of six years. Generally, children who are old enough to be able to express themselves through spoken language but who are not yet literate enough to participate in writing-based research.

## ***Appendix 2. Literature on young children and museums***

<b>Authors</b>	<b>Literature type</b>	<b>Data set</b>	<b>Age span</b>	<b>Country/area</b>	<b>Museum type</b>	<b>Group type</b>
Anderson et al. (2002)	Research article	99 children	4 to 6	Australia	Art, History/ culture, Nature & Science	School
Anderson et al. (2008)	Research article	99 children	4 to 6	Australia	Nature	School
Ash (2003)	Research article	3 families	1 to 9	USA	Science	Family
Ash (2004a)	Research article	3 families	4 to 8	USA	Nature & Science	Family
Ash et al. (2007)	Research article	20 families	4 to 10+	USA	Nature & Science	Family
Bitgood et al. (2011)	Research article	645 families	0 to 10+	USA		Family
Blackwell (2009)	Report – grey lit	Not stated	Not stated (~1 to 5)	UK	Nature	Family
Borun et al. (1995)	Lit review			USA		Family
Borun et al. (1996)	Research article	129 families	5 to 10	USA	Science	Family
Bryan (2008)	Internal evaluation	15 children (& 4 siblings)	1 to 5	UK	History/ culture	Family
Callanan et al. (2002)	Research article	126 families	0 to 10+	USA	Children's	Family
Carr et al. (2012)	Research article	25 children	0 to 5	New Zealand	Art, History/ culture & Nature	School
Clarkin-Phillips et al. (2013)	Research article	~10 children	2 to 5	New Zealand	Art	School
Cook & Hess (2007)	Research article	12 children	3 to 5	Europe	Art	School
Crowley & Jacobs (2002)	Research article	28 families	4 to 10+	USA	Children's, Nature & Science	Family

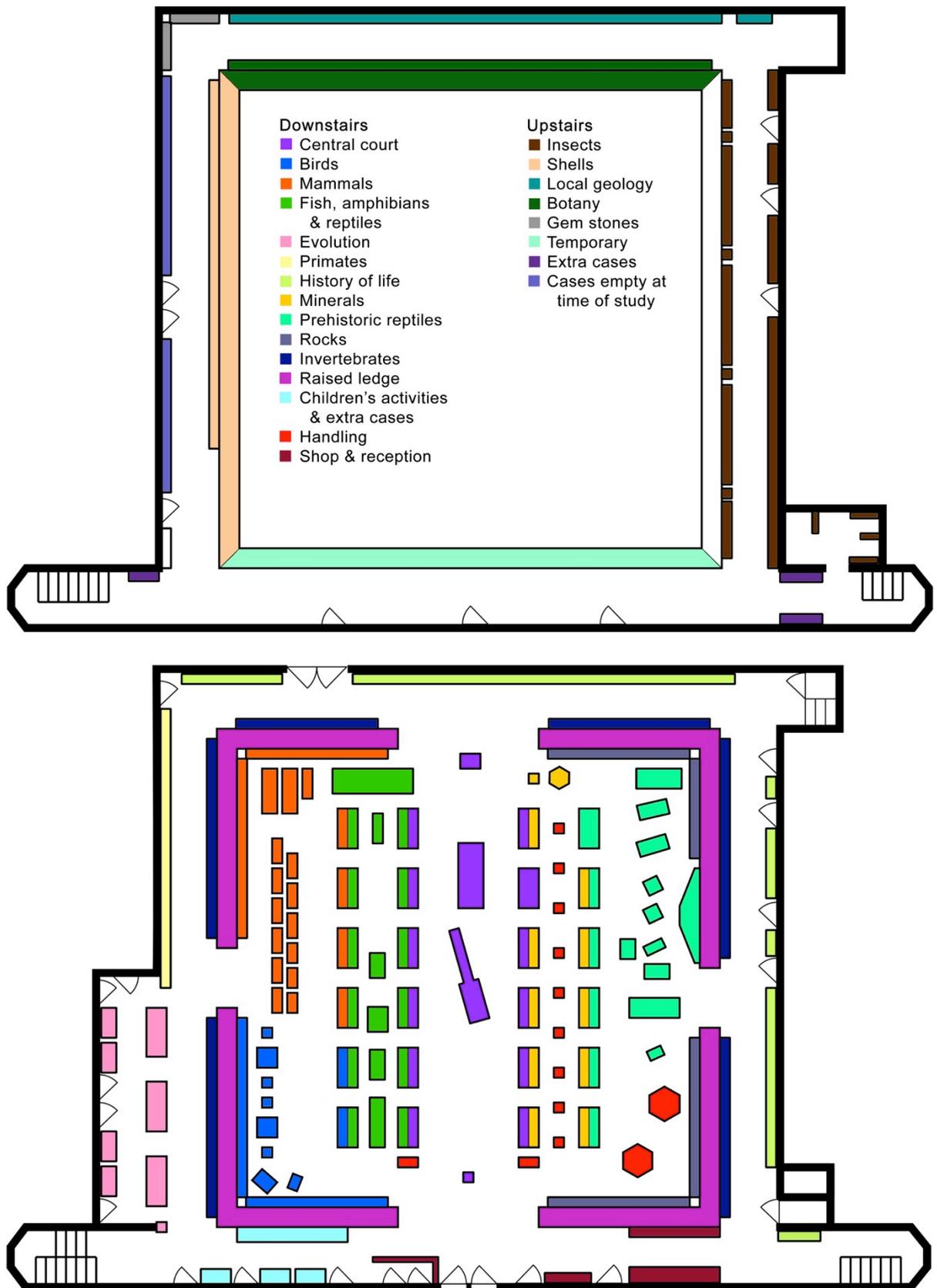
<b>Authors</b>	<b>Literature type</b>	<b>Data set</b>	<b>Age span</b>	<b>Country/area</b>	<b>Museum type</b>	<b>Group type</b>
Crowley & Callanan (1998)	Research article	90 children	Not stated (~2 to 10+)	USA	Science	Family
Crowley et al. (2001)	Research article	298 families	0 to 8	USA	Children's & Science	Family
Danko-McGhee (2006)	Research article	50 children	2 to 6	USA	Art	Family
Dierking (1989)	Lit review			USA		Family
Dierking & Falk (1994)	Lit review			USA	Nature & Science	Family
Dockett et al. (2011)	Research article	40 children	0 to 6	Australia	History & Nature	Family
Dooley & Welch (2014)	Research article	30 children	0 to 9	USA	Children's	Family
Dunn (2012)	Research article	24 children	3 to 7	Australia	History/culture	Family
Everett & Piscitelli (2006)	Research article	66 children	4 to 8	Australia	Nature	School
Falk (1991)	Research article	69 families	0 to 10+	USA	Nature	Family
Fasoli (2001)	Research article	7 children	4 to 5	Australia	Art	School
Fasoli (2003)	Research article	7 children	4 to 5	Australia	Art	School
Feder (1989)	Memoir	3 (Author, father and son)		USA	Nature	Family
Fidler et al. (2011)	Report – grey lit	7 families (Manchester Museum section)	Not stated (~2 to 4)	UK	History/culture	Family & school
Graham (2008a)	Report – grey lit	5 nursery groups	1 to 4	UK	Art, History/culture & Nature	School
Graham (2008b)	Report – grey lit	Not stated	Not stated (~0 to 5)	UK	Art, History/culture, Nature & Science	Family & school

<b>Authors</b>	<b>Literature type</b>	<b>Data set</b>	<b>Age span</b>	<b>Country/area</b>	<b>Museum type</b>	<b>Group type</b>
Graham (2009)	Report – grey lit	Not stated	0 to 5	UK	Art, History/ culture & Nature	Family
Haas (1997)	Research article	281 children	Not stated (~0 to 7)	USA	Children's & Science	Family
Hackett (2012a&b)	Research article	4 children	0 to 2	UK	Art, History/ culture & Nature	Family
Kelly et al. (2006)	Research article	40 children	0 to 5	Australia	Children's, History/ culture & Nature	Family
Kindler & Darras (1997)	Research article	120 children	4 to 5	USA & Europe		School
Kropf (1989)	Lit review			USA		Family
Laetsch (1982)	Lit review			USA	Nature	Family
MacRae (2007)	Research article	Not stated (small group)	Not stated (~3 to 5)	UK	Art	Family
McManus (1994)	Research article	197 groups	Not stated (~0 to 10+)	UK	Nature	Family & school
Melber (2007)	Research article	31 children & mothers	4 to 5	USA	Nature	Family
Moffat (1992)	Research article	Children from 15 schools	5 to 9	UK		School
Murdock (1987)	Museum description			USA	Nature	
Palmquist & Crowley (2007)	Research article	42 families	5 to 7	USA	Nature	Family
Piscitelli (1997)	Comment			Australia	Art	Family
Piscitelli (2001)	Research article	99 children	4 to 6	Australia	Art, History/ culture, Nature & Science	Family & school

<b>Authors</b>	<b>Literature type</b>	<b>Data set</b>	<b>Age span</b>	<b>Country/area</b>	<b>Museum type</b>	<b>Group type</b>
Piscitelli & Anderson (2000)	Research article	77 children	4 to 6	Australia		School
Piscitelli & Anderson (2001)	Research article	77 children	4 to 6	Australia	Art, History/ culture, Nature & Science	School
Piscitelli & Weier (2002)	Research article	4000 children & adults	2 to 8	Australia	Art	Family & school
Piscitelli et al. (2003)	Report based on research	77 & 99 children	4 to 6	Australia	Art, History/ culture, Nature & Science	Family & school
Rossi-Linnemann (2010)	Museum description			UK & Europe	Art, Children's, History/ culture, Nature & Science	
Sanford et al. (2007)	Research article	31 children & grandparents	5 to 10+	USA	Science	Family
Savva & Trimis (2005)	Research article	32 children	5 to 6	Europe	Art	School
Shaffer (2012)	Museum description			USA		
Shine & Acosta (2000)	Research article	30 children & parents	4 to 6	USA		Family
Siegel et al. (2007)	Research article	40 families	3 to 9	USA	Science	Family
Speering et al. (1997)	Research article	150 children	3 to 7	Australia	Science	
Synodi (2014)	Research article	4 classes	3 to 6	UK & Europe	Nature	School
Tunncliffe (1995)	Doctoral thesis	141 classes	3 to 10+	UK & USA	Nature	
Tunncliffe (2000)	Research article	598 conversations	2 to 10+	UK	Nature	
Tunncliffe & Reiss (2000)	Research article	69 classes	3 to 10+	UK	Nature	School

<b>Authors</b>	<b>Literature type</b>	<b>Data set</b>	<b>Age span</b>	<b>Country/area</b>	<b>Museum type</b>	<b>Group type</b>
Weier (2004)	Research article	2 children discussed	4 to 5	Australia	Art	Family & school
Weier & Piscitelli (2003)	Research article	99 children	4 to 6	Australia	Science	School
Wolf & Wood (2012)	Overview of evaluation			USA	Children's	School
Wolins (1982)	Editorial			USA		Family
Wolins (1989)	Editorial			USA		Family
Wutak (1987)	Museum description			USA	Nature	Family
Zapri (2007)	Research article	19 children	4 to 5	Europe	Art & History/ culture	Family & school

**Appendix 3. Plan of Oxford University Museum of Natural History**



## Appendix 4. Parental information form

### **Your rights**

Your participation in this research is entirely voluntary and you are free to withdraw from the project at any point. If you are unsure about any aspect of your participation please contact me to discuss your concerns or ask for clarification on any aspect of the study.

If I want to use photographs of your children within the final thesis, or any other publications, I will contact you to get your permission again each time.

### **Protecting your confidentiality**

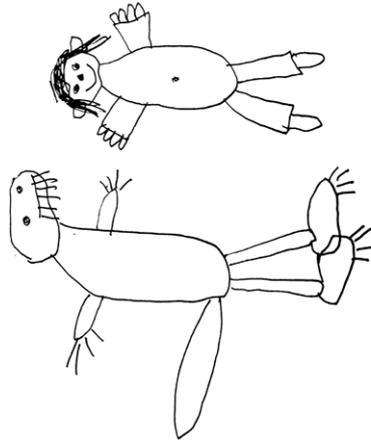
The research has been approved by the University of Leicester, and complies with their code of ethics:

<http://www2.le.ac.uk/institution/committtees/research-ethics/code-of-practice>

Any information you give me will be treated confidentially. All participant names will be changed to give you and your child anonymity when the project is written up. The data will be stored securely by being locked away or password protected.

If you have any questions about the ethics of the research please contact the School of Museum Studies Ethics Officer, Dr Giasemi Vavoula, on [gv18@le.ac.uk](mailto:gv18@le.ac.uk).

Thank you for reading this information. I hope that you are willing to help me with this research. Could you please indicate whether you are happy to be involved or not on the consent form.



# Helping out with Young Children's Experience of Natural History in Museums research project

Guide for Parents & Children



### **My Contact Details**

Elee Kirk (PhD Researcher)  
Museum Studies, University of Leicester,  
19 University Road, Leicester, LE1 7RF

[ek170@le.ac.uk](mailto:ek170@le.ac.uk)

0116 2825868

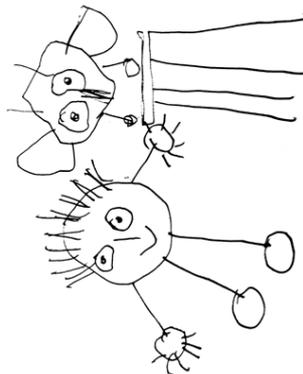
Find out more about my research at:  
[www.le.ac.uk/ms/research/Eleekirk.html](http://www.le.ac.uk/ms/research/Eleekirk.html)

School of Museum Studies  
University of Leicester  
2011

This leaflet provides you with information about a research project,

“Young Children’s Experience of Natural History in Museums”

which I would like your child or children to be involved in. It will tell you more about the nature of the project, who I am, why I am undertaking this research, and why I would like your child to be involved. It will also tell you about how the research will be used and how you and your children’s privacy and confidentiality will be protected.



**Who is doing the research?**

My name is Elee Kirk, and I am a PhD researcher at the School of Museum Studies in the University of Leicester. I have worked in museums since 2001, and am now finding out more about young visitors’ experiences by carrying out this research.

**What is the research for?**

This research will help us to understand the ways that young children respond to natural history in museums, including what they are interested in, how they make sense of it, and they ways that they interact with it.

This will help museums to find better ways of listening to the views of young children. It will also help museums to find new ways of using natural history objects to appeal to younger visitors.

**How you were selected**

This project focuses on children aged four and five years old who speak English and who are visiting the museum with their families or friends. Your child has been selected because he or she fits these requirements.

**Your role in the research**

Firstly, before your child takes part in this research I will explain to them, in a way they will understand, what they will be doing and ask them if they are happy to take part.

This research will then involve your child taking photographs of the gallery during your visit. Then, when you have finished visiting the museum, I will ask them to explain their photos to me.

Any conversations with your child will be recorded through written notes and a voice recorder.

I will also take a photograph of each child who takes part, to help me identify them during my research. These photographs will not be published, and I will delete them as soon as my research is complete.



I may also ask you to answer a few questions about your child’s museum visit, which may be recorded through written notes or by voice recorder.

The amount of time that this takes will depend on the amount of time you and your child can spare.

I will be asking around 30 children to take part, and this will help me to understand how different children respond to Natural History in museums.

## Appendix 5. Parental consent form

EK Museum Studies



### Research Consent form for parents & guardians

I agree for myself and my child to take part in the ‘Young Children’s Experience of Natural History in Museums’ project which is research towards a Museum Studies PhD at the University of Leicester.

My child and I have had the research explained to us and I have read the Information sheet about the research, which I may keep for my records.

I understand that this research will be carried out in accordance with the University of Leicester’s Code of Research Ethics. Material my child and I provide as part of this study will be treated as confidential and securely stored in accordance with the Data Protection Act 1998.

I have read and I understand the information leaflet	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
I have been given the opportunity to ask questions about the project and they were answered to my satisfaction	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
I understand that my child and I can withdraw from the study at any time	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
My child have had the project explained to them and he/she has consented to take part	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
I agree to the interviews being recorded	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
I agree to the research using photographs taken by my child within the public space of the museum	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
I agree to the research using photographs of my family, taken by my child within the public space of the museum	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
I agree to my child being photographed to help the researcher identify them during the research (to be deleted once research has finished)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
I request that our comments are presented anonymously	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

**[PLEASE PRINT]**    **Parent’s name** .....

**Child’s name** .....    **Month & year of birth** .....

**Address** .....

.....

**Telephone** .....    **Email** .....

**Signature** .....    **Date** .....

## Appendix 6. Table of participants

Code	Museum	Date	Interview type	Child pseudo-nym	Child age	Child gender	Visit length (mins)	No. of photos	Interview length (mm:ss)
<b>Pilot studies</b>									
DH01	Herbert	14/10/10	Drawing	Hannah & Martha	Y1	F & F	30	N/A	08:36
DH02	Herbert	14/10/10	Drawing	Parveen	Y1	F	30	N/A	03:46
PN01	New Walk	13/02/11	Photos	Rebecca	4y	F	15	11	08:55
DX01	OUMNH	25/02/11	Drawing	Barney & Jamie	4y & 3y	M & M	?	N/A	12:14
DX02	OUMNH	25/02/11	Drawing	Jane	5y	F	?	N/A	10:15
TX01	OUMNH	26/02/11	Tour	Callum	5y	M	?	N/A	06:02
TX02	OUMNH	26/02/11	Tour	Bobby & Nick	4y & 3y	M & M	?	N/A	08:17
<b>Main studies</b>									
PX01	OUMNH	27/02/11	Photos	Kyle	5y	M	70	25	14:40
PX02	OUMNH	27/02/11	Photos	Fred	5y	M	105	28	09:39
PX03	OUMNH	14/04/11	Photos	Delia	4y 7m	F	45	24	07:54
PX04	OUMNH	14/04/11	Photos	Marie	5y 7m	F	45	63	17:36
PX05	OUMNH	15/04/11	Photos	Greg	4y 6m	M	30	35	09:06
PX06	OUMNH	15/04/11	Photos	Karen	4y 6m	F	30	40	09:39
PX07	OUMNH	15/04/11	Photos	Shama	5y 7m	F	100	9	08:06
PX08	OUMNH	16/04/11	Photos	Amy	4y 1m	F	60	67	10:09
PX09	OUMNH	16/04/11	Photos	John	4y 5m	M	50	68	17:27
PX10	OUMNH	17/04/11	Photos	Jack	5y 3m	M	50	15	12:45
PX11	OUMNH	17/04/11	Photos	Bonnie	5y 6m	F	50	10	12:24
PX12	OUMNH	25/07/11	Photos	Ally	4y 5m	F	25	34	11:05
PX13	OUMNH	25/07/11	Photos	Justin	4y 11m	M	30	26	11:50
PX14	OUMNH	25/07/11	Photos	Eloise	5y 3m	F	30	135	20:36
PX15	OUMNH	26/07/11	Photos	Haden	4y 11m	M	35	40	13:18
PX16	OUMNH	26/07/11	Photos	Imogen	5y 0m	F	15	31	09:05
PX17	OUMNH	26/07/11	Photos	Harvey	5y 1m	M	35	33	15:45
PX18	OUMNH	27/07/11	Photos	Maisie	4y 4m	F	15	7	09:35
PX19	OUMNH	27/07/11	Photos	Anna	4y 11m	F	55	162	08:46
PX20	OUMNH	27/07/11	Photos	Amar	5y 8m	M	15	28	08:33
PX21	OUMNH	29/07/11	Photos	Rhys	4y 4m	M	25	35	10:55
PX22	OUMNH	29/07/22	Photos	Kiet	5y 2m	M	30	27	10:53
PX23	OUMNH	29/07/11	Photos	Oscar	5y 8m	M	25	64	17:57
PX24	OUMNH	30/07/11	Photos	Clara	5y 3m	F	30	19	10:59
PX25	OUMNH	30/07/11	Photos	George	5y 10m	M	80	219	20:22
PX26	OUMNH	30/07/11	Photos	Miriam	5y 0m	F	40	44	12:07
PX27	OUMNH	01/08/11	Photos	Caroline	5y 5m	F	10	58	11:06
PX28	OUMNH	01/08/11	Photos	Nina	4y 10m	F	30	47	09:16
PX29	OUMNH	01/08/11	Photos	Daniel	4y 5m	M	30	41	09:48
PX30	OUMNH	02/08/11	Photos	Josh	5y 9m	M	25	40	16:31
PX31	OUMNH	02/08/11	Photos	Brendan	4y 9m	M	20	36	11:25
PX32	OUMNH	03/08/11	Photos	Irena	4y 5m	F	25	87	14:22

## **Appendix 7. Example of interview transcript from Kyle**

*Note: Codes such as [PX01\_01] refer to photographs. Numbers in parentheses refer to the time in minutes.*

27th February 2011. Sunday morning in half term. Interview with photographs.

INTERVIEW PX01

*Kyle is visiting with his mother, father and, sister (3). They spent around 1hr 10mins in the museum. This interview was carried out as a pilot of the photography interview method in OUMNH.*

Elee: (00:00) ... are you? Are you overheating a bit there Kyle? Have you been to this museum before? Have you? Kyle, when you tell me something can you say it out loud? Because my machine can't see nodding, it's not that clever! Can you see yes to me? Yep? So you've been to the museum before have you?

Kyle: Yep.

Elee: Do you live near here then?

Mother: Banbury.

Elee: OK.

Mother: So not too far really.

Elee: OK. Oh, you like it here then do you? Why did you want to come here?

Kyle: Because, um...

Mother: What did we come to look at? We came to look at the what?

Kyle: Dinosaurs.

Elee: Do you?

Mother: Yeah.

Elee: You're not the only ones! Right ok, so let's see. Which picture do you want to talk about first of all Kyle?

Kyle: The owl one.

Elee: You want to talk about the owl?

Kyle: Yeah.

Elee: OK, brilliant. So you were taking... what were you taking a picture of here then?

Kyle: The owl because it came to my school, one of those owls did. [PX01\_01, owl on handling table]

Elee: Did it?

Kyle: A eagle owl.

Elee: Was it alive or was it like this one?

Kyle: Um, alive. (01:00)

Elee: It was alive? So you knew about it already did you?

Kyle: Yeah.

Elee: Did you touch this one?

Kyle: No, I couldn't hold it because it was even bigger as that.

Mother: The one at school you mean?

Elee: The one at school you didn't hold?

Kyle: Yeah, I didn't hold any other because they had sharp claws on their feet.

Elee: Yeah, you don't want... you have to be careful don't you? So what did you do when you saw this owl here? The one in the museum?

Kyle: I... I...

Elee: Did you look at it? Or did you touch it as well?

Kyle: I looked at it.

Mother: You looked at it and said it was the same as what come to your school, didn't you? That's what you said.

Elee: Did you? And did you know what it's name was when you saw it?

Kyle: No.

Elee: But you know now, because you just told me, didn't you.

Kyle: Yeah.

Elee: Did you do anything else when you were at this table?

Mother: You looked at some of the things that were round there, didn't you? I can't remember what was there now.

Elee: And is this your sister here?

Kyle: Yeah.

Elee: Did she do anything when she was there? (02:01)

Kyle: Um, yeah.

Elee: What did she do?

Kyle: She shouted a lot.

Elee: Did she?

Kyle: Yeah

Elee: Where you excited? Is that why?

Kyle: She was down there. Down by that um... elephant thing down there, yeah, and she, and she said come and have a look at this it's another dinosaur but it was a elephant!

Elee: Ah, you thought it was a dinosaur? Did you know that it was an elephant when you saw it? Kyle?

Kyle: Yeah, because it... it had...

Mother: Mummy told you, didn't I?

Kyle: Yeah, because I saw... when my mum was round that other side I saw, I saw a tusk of it.

Elee: Oh right, so you found out when you were there that it was an elephant did you?

Kyle: Yeah.

Elee: Ok, cool. Shall we go back to these pictures? Do you want to tell me anything else about what's in this picture?

Kyle: Yeah.

Elee: What do you want to tell me about it?

Kyle: Cause I took a picture of the rabbit because the owl was creeping up on the rabbit.

Elee: *[laughs]* It is, isn't it? (03:01) So you thought that was funny did you?

Kyle: Yeah.

Elee: You're right. It's a good picture, isn't it? Do you like that picture?

Kyle: Yeah.

Elee: Ah, brilliant. Do you want to say anything else about it?

Kyle: No.

Elee: OK. Right, now. Shall we find one of the others that you want to talk about? What else? Do you want to say anything else about any of the ones up here?

Kyle: The pheasant.

Elee: That one? You want to talk about that one? [PX01\_04, pheasants on handling table]

Kyle: Because I was going to the tip with my Grampy and I ran over one.

Elee: No way! Did you? *[laughs]* Do you know what it is?

Kyle: A pheasant.

Elee: Yeah! So you've seen one of those but it wasn't alive, was it?

Kyle: No.

Elee: Oh, poor thing! What did you do when you were here in the museum when you saw this?

Kyle: I looked at the other one next to it and they were nearly the same.

Elee: Were they? (04:00)

Kyle: Yeah.

Elee: Did you just look at them or did you touch them?

Kyle: I didn't touch them.

Elee: You just looked at them?

Kyle: Yeah.

Elee: Why didn't you touch them?

Kyle: Because...

Mother: Because he was probably too busy taking pictures, wasn't you?

Kyle: Yeah.

Elee: Were you? Ah, ok. Did you see anything else in this picture that you wanted to tell me about?

Kyle: Yeah, the otter down there.

Elee: What do you want to say about the otter?

Kyle: It, it, um... I looked at it's teeth and it had really sharp teeth on it.

Elee: Yeah, it does, doesn't it? Is that what you liked about the otter?

Kyle: Yeah.

Elee: Cool. Alright, do you want to say anything else about this picture?

Kyle: No.

Elee: Ok, shall we go back and look at all of them together now. Right, ok. Shall I... Do you want to say anything about these ones here or shall I go and look at the ones underneath?

Kyle: Look at the ones underneath.

Elee: Right, OK... You've got some brilliant... Did you take all these pictures yourself Kyle? Did you?

Mother: Yeah, he did, yeah.

Elee: Fantastic, well done! (05:00) When I did this before, the little girl told her mum which ones she wanted to take, so she gave instructions. Do you want to tell me about any of these ones here Kyle?

Kyle: *[says something quietly]*

Elee: That one there, Ok. [PX01\_17, plesiosaur]

Kyle: Cause I've seen that one on a dinosaur programme.

Elee: Have you? Do you know what it is?

Kyle: Um, no. It didn't tell us the name on the dinosaur programme.

Elee: So is that why you liked it, because you've seen it before?

Kyle: Yeah. An' I've seen... I've seen another... I've seen the teeth of it down in that... just down there.

Elee: So you've seen it's teeth as well have you?

Kyle: Yeah. I went down there and saw it and then I went up there and seen it.

Elee: So you went, so it's over in that corner with this model, isn't it? And then you saw it's teeth in the other corner did you?

Kyle: Yeah, the other, um... down...

Elee: Ah, what did you think of it's teeth? What were they like?

Kyle: Um, sharp.

Elee: Were they?

Kyle: Yeah.

Elee: Were they big?

Kyle: Yeah.

Elee: Oh my goodness. (06:00) Big sharp teeth. Right ok, so that's... I think that's a big sea monster thing there, isn't it?

Kyle: It's a dinosaur sort ... it eats... um... it was ... it was on these pictures but it's still there, it is, because I took a picture of what it eats...

Elee: Is there a picture on one of the other pictures do you mean?

Kyle: Yeah.

Elee: Do you want to show me what it is?

Kyle: Yeah.

Elee: Ok, let's see that other picture then. Which picture is the picture of what it eats then?

Kyle: Um I think my mum deleted it.

Elee: Oh, did she?

Mother: Did I?

Kyle: It's the one with the two... um... long... um... things...

Mother: This bit at the bottom with his jaws, is that what you mean?

Kyle: No.

Mother: Oh.

Elee: The picture of the sort of animal that it eats? Is that what you mean?

Kyle: Yeah.

Mother: I don't know what that was.

Elee: Can you tell me about it?

Kyle: Um, yeah. It was ... somewhere round there.

Elee: In the dinosaur area, is it?

Kyle: Yeah. (07:01)

Elee: Is there any of these other pictures that you want to tell me about? OK, that one there. That's a great picture, I really like that. What's that a picture of?

Kyle: A salmon. [PX01\_24]

Elee: A salmon?

Kyle: Yeah, it looks like a dinosaur one.

Mother: It's a tuna fish Kyle, I think.

Elee: It does look like... why does it look like a dinosaur?

Kyle: Because it looks like a swimming, um ... dinosaur like the... um...

Mother: The bones, do you mean?

Kyle: Yeah, um ... a swimming dinosaur bones.

Elee: Oh, it looks like the dinosaur bones? And it's big as well, isn't it?

Kyle: Yeah.

Elee: Did you like looking at that one?

Kyle: Yeah.

Elee: Fantastic. Did you talk about anything when you were there?

Kyle: No.

Elee: You just looked at it?

Kyle: I didn't see those up there though.

Elee: Oh, the ... skeletons that are hanging from the ceiling?

Kyle: Yeah, I didn't go through that one. (08:01)

Elee: Oh, well you'll have to go through that when you've uh ... maybe when you've finished talking to me, won't you?

Kyle: Yeah.

Elee: There's so many things to see here, aren't there?

Kyle: Yeah. Oh, we didn't even go round there.

Elee: Really?

Mother: I think we did. We did cause that crocodile's that side.

Kyle: Mm... I know, but we didn't go up there mum.

Elee: Up on the top?

Kyle: Yeah. We went up there, but we just went up that bit, but not up that bit.

Elee: Wow, there's so much to see here, isn't there? Do you want to tell me anything more about this picture?

Kyle: Um... you can look through its mouth and you can see its tail.

Elee: *[laughs]* You can see its tail through its mouth?

Kyle: Yeah.

Elee: Is that funny?

Kyle: Yeah.

Elee: *[laughs]*.

Kyle: I looked through its mouth when I was taking a picture of it and I saw its tail.

Elee: Its a good picture looking right through its mouth isn't it?

Kyle: Yeah.

Elee: That's, you see ... cause of the height that you are, you can see things that us grown ups can't see. Cause we're too high up and we don't realise that you can see its tail through its mouth *[laughs]*. Do you want to tell me anything else about this? (09:00)

Kyle: Um... no.

Elee: Do you want to tell me anything ... Do you have a time constraint?

Mother: No, we're alright. When they get fed up.

Elee: Yeah.

Kyle: I can ... If you go back ... Go back ...

Elee: Up. Ok.

Kyle: That one, it is. [PX01\_06] That one ... that fishy one what we...

Mother: Ok, I didn't delete it did I.

Kyle: The one with the big jaws, that's what it eats.

Elee: So the big sea monster one where you saw its jaw. It eats this one here?

Kyle: Yeah, that fishy thing. And when it's eating ... when that, is eating it's fish, yeah, it quickly creeps, swims up to it and grabs it.

Elee: Does it?

Kyle: Yeah.

Elee: Did you find out about that?

Kyle: No, I just watched it on the television.

Elee: You found out on the television and then you saw them here?

Kyle: Yeah.

Elee: Oh, wow.

Kyle: Because there's every dinosaur on walking with the dinosaurs.

Elee: Is that where you saw it? On that programme? (10:00)

Kyle: Yeah, and on the new Jurassic Park.

Elee: Oh. Do you watch lots of things about dinosaurs when you're at home?

Kyle: Yeah.

Elee: Have you got any toy dinosaurs?

Kyle: Yeah.

Elee: Have you?

Mother: Lots.

Elee: Really?

Mother: Yeah.

Elee: Fantastic.

Kyle: I've got a basher head.

Elee: A basher head?

Kyle: Yeah.

Elee: Is that a type of dinosaur?

Kyle: Yeah.

Elee: Is it?

Kyle: A basher head has got a head has got uh ... a head like a hammer but... uh... it's like got curved horns, it's like a curved thing on it's head.

Elee: Has it? Why is it a basher head? Does it...

Kyle: Cos it bashes other animals like it.

Elee: Oh, does it?

Kyle: It bashes the same animal.

Elee: Oh, so they bash into each other do they?

Kyle: I ... I saw that on dinosaur king.

Elee: Did you?

Kyle: Yeah, when they ... like that ... Duff!

Elee: Oh my goodness, and they crash into each other?

Kyle: Yeah, and there ... this was really funny bit, this was the funniest bit in Dinosaur King. (11:00) It crashed together and the ... the banger bit, the hard bit on their heads broke.

Elee: Oh my goodness! *[laughs]*

Kyle: They bash in so hard it broke.

Elee: Wow. Is there one of those in this museum?

Kyle: No.

Elee: No? You've not seen those?

Kyle: I have seen the basher head one though.

Elee: In this museum.

Kyle: Yes. Just down there.

Elee: Is it?

Kyle: Yeah.

Elee: Down near the skeletons somewhere?

Kyle: Uh ... down at the back.

Elee: At the back?

Kyle: Yeah.

Elee: Oh, ok. Right, shall we choose one more to look at?

Kyle: Yeah.

Elee: Ok. Which one ... is your favourite one out of all of these that we can see here? Or do you want to go down?

Father: You liked the fox don't you Kyle?

Kyle: That one. [PX01\_10, utahraptor]

Elee: You want to pick this one? There's so much to talk about, and Kyle you're very good at talking to me about these. I think you could stay and talk to me all day about them.

Mother: Yeah.

Elee: But you probably want to go and have some food or something. (12:00)

Kyle: I know because I've got a toy velociraptor and it's not the same but ...

Elee: It's not the same?

Kyle: But my cousin has a ... um ... velociraptor like it but green.

Mother: Yeah, that's right.

Elee: Oh, so is it a different colour? Is that why it's not the same? So why did you take this picture?

Kyle: Because I recognise it from Charlie's ... um my cousin's name is called Charlie and he's got that dinosaur one and he ... he bites it sometimes.

Elee: He bites the dinosaur?

Kyle: Yeah.

Elee: Or does the dinosaur bite him?

Kyle: He bites it's head.

Elee: He bites the dinosaur's head?

Kyle: Yeah *[laughs]*

Elee: *[laughs]* That's a strange thing to do, isn't it? Is he funny?

Kyle: Yeah.

Elee: Is he? How old's Charlie?

Kyle: Three.

Elee: Oh, ok.

Kyle: He's going to be three soon.

Elee: Is he, ok. So did you take the picture because it made you think about Charlie's dinosaur then? (13:01)

Kyle: Yeah.

Elee: Ah ... And why do you like the velociraptor?

Kyle: Because it's my favourite dinosaur.

Elee: Is it?

Kyle: Yeah.

Elee: Oh, wow. So you've found your favourite one here?

Kyle: Yeah, and I've got the toy of it.

Elee: Oh, have you?

Kyle: Yeah.

Elee: You've got it as well?

Kyle: Yeah. Sometimes we play velociraptor fights.

Elee: Do you?

Kyle: Yeah.

Elee: Wow, that sounds a bit scary. Is it fun?

Kyle: Yeah.

Elee: Brilliant. Do you want to tell me anything else about this velociraptor?

Kyle: No.

Elee: No?

Kyle: There's too much on the velociraptor. I can't really see its tail.

Elee: No, it's round the back isn't it?

Kyle: Yeah.

Elee: Round the back of this picture.

Kyle: I can see the bottom of it.

Elee: Yes. But not ... it's tail's behind, isn't it?

Kyle: But I can just see the end of it.

Elee: Yes, that's right. Just underneath. (14:00)

Kyle: But not the rest.

Elee: Fantastic. Well, I think you've done a very good job of telling me about this museum, um, Kyle. I nearly called you Charlie then, but that's your cousin's name, isn't it?

Kyle: Yeah.

Elee: There you go, my computer switched itself off. Um. So thank you very much. Do you want to press the button to finish it? The middle button?

*[Recording ends]*

## Appendix 8. Example contact sheet from Kyle

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PX01\_01Ys.JPG



PX01\_02s.JPG



PX01\_03s.JPG



PX01\_04Ys.JPG



PX01\_05s.JPG



PX01\_06Ys.JPG



PX01\_07s.JPG



PX01\_08s.JPG



PX01\_09s.JPG



PX01\_10Ys.JPG



PX01\_11s.JPG



PX01\_12s.JPG



PX01\_13s.JPG



PX01\_14s.JPG



PX01\_15s.JPG



PX01\_16s.JPG



PX01\_17Ys.JPG



PX01\_18s.JPG



PX01\_19s.JPG



PX01\_20s.JPG



PX01\_21s.JPG



PX01\_22s.JPG



PX01\_23s.JPG

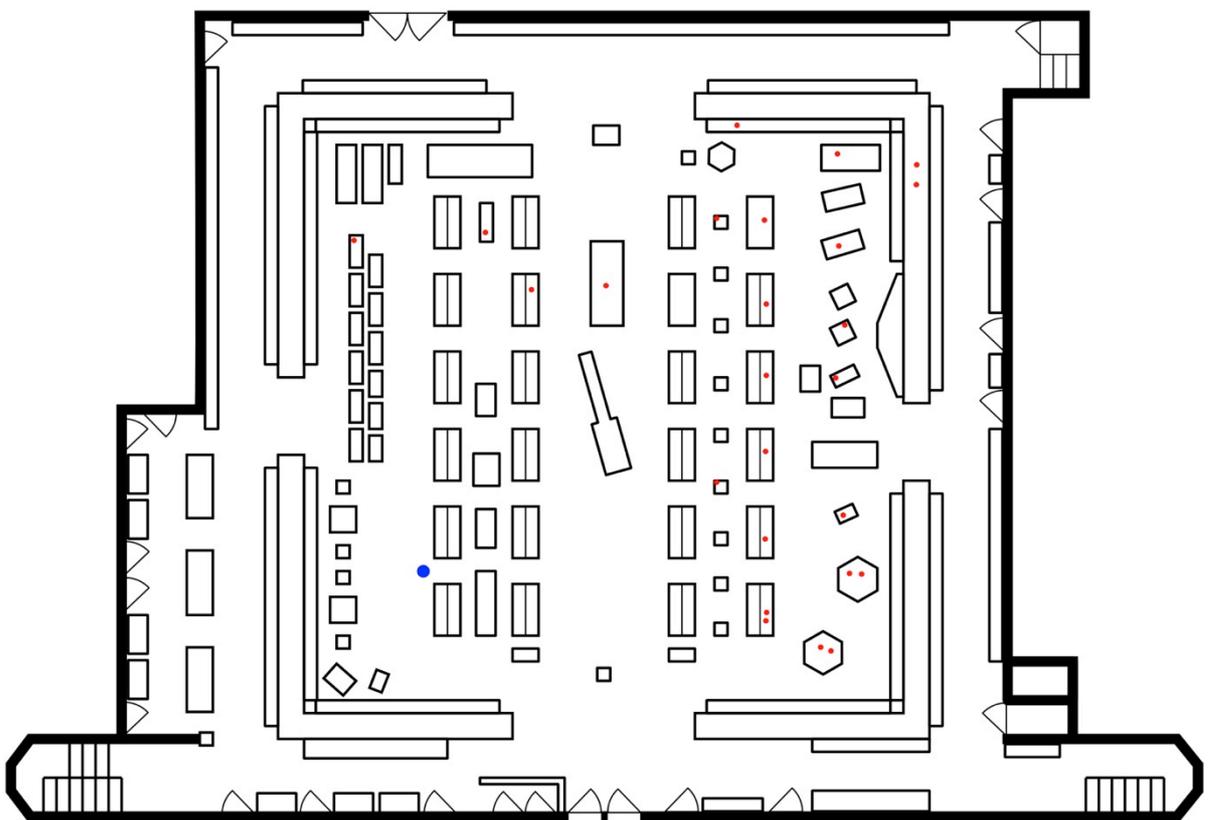
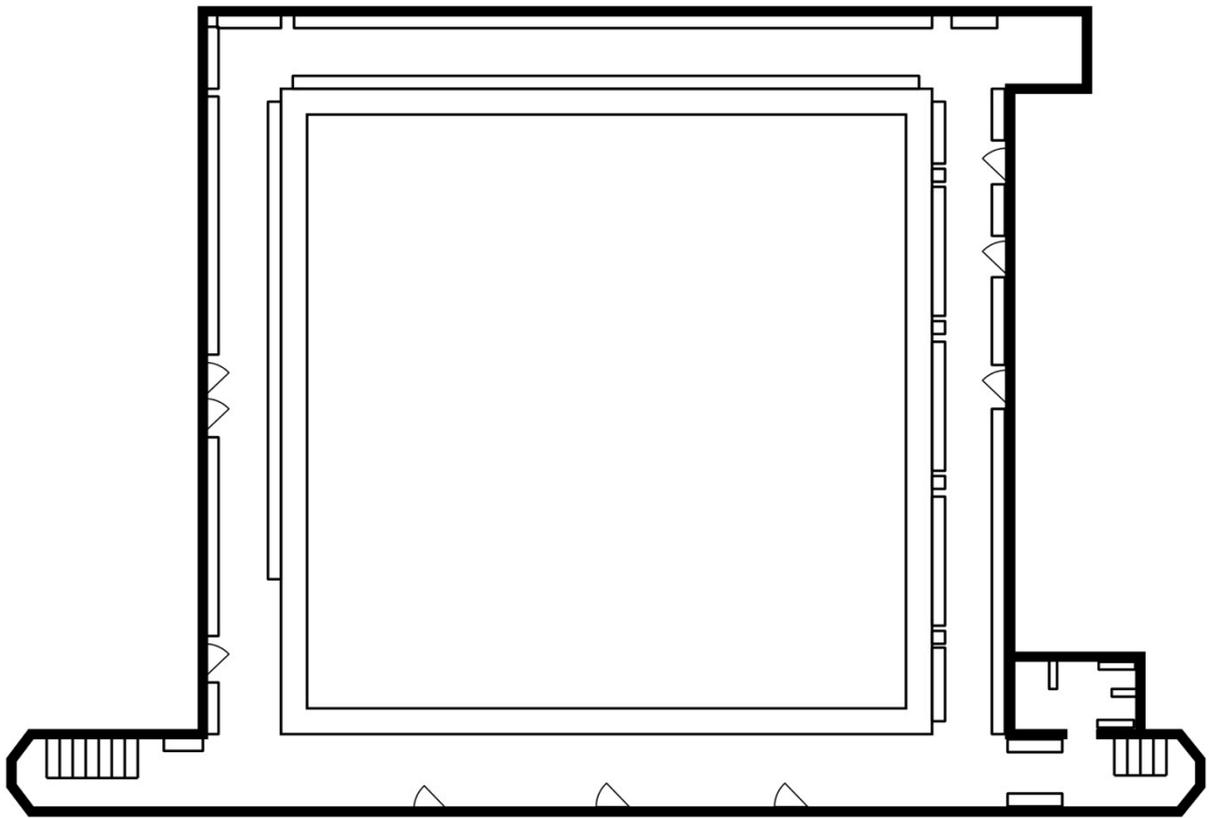


PX01\_24Ys.JPG



PX01\_25s.JPG

*Appendix 9. Example of child's photograph map from Kyle*



Red spots = Kyle's photographs. Blue spot = where I waited for participants to finish.

## ***Appendix 10. Examples of observation notes***

Key:

AF = Adult female

AM = Adult male

*F<sub>n</sub>* = Female child, with estimated age in years (e.g. *F5* is a girl of roughly five years of age)

*M<sub>n</sub>* = Male child, with estimated age in years

*Ob<sub>nn</sub>* = Identifier codes for groups observed

XOb07

11/04/12

Near tyrannosaurus

AM, M5, M2

Young boy leading, points at the tyrannosaurus skeleton. Father and older boy follow. Father and older boy talking about exhibits behind tyrannosaurus. Younger boy goes to the iguanodon skeleton and grabs the tail bones and shakes them. Father and older boy catch up. Older boy sees a stick left on the iguanodon base. The boys then argue about the stick and the younger boy hits the older boy. Father tells them off. Then Father and older boy look in the Buckland case and the younger boy sits on his father's feet. They move on. Younger boy points at cheetah as they move out of sight.

XOb21

11/04/12

Near entrance & central court

AF, AM, F6, M4

The family come into the museum — the children are holding hands. They see the cheetah and point to it, saying, “Look!”. Then boy lets go and walks to the Biodiversity case, saying, “Look!” and pointing. Then he looks up and sees the iguanodon and says, “A dinosaur!”. His mother catches my eye and smiles. Mother and boy walk towards the iguanodon and then on to the tyrannosaurus. Father and daughter are trailing behind. The boy poses for a photograph by the tyrannosaurus, but is also looking at other cases. Father and daughter are talking together. They catch up and the boy says, “A

trianosaur!”, which the father repeats, smiling. They move on. The boy is very stimulated by surroundings, excitedly looking in cases and moving faster than his parents and sister.

XOb51

13/04/12

Near mammal skeleton parade

AF, F7, F5

The girls are doing the Easter egg trail, looking for the different numbers. The younger girl walks towards the skeletons and says, “Am I allowed to touch them?” Her mother says, “Yes, I think so,” and the girl cautiously touches the tapir’s foot. Then the mother comes over and sees the sign and says, “No, actually you aren’t supposed to touch them.” They look for a little while, then go back to the trail. Then the girl looks back at the skeletons and says, “If you aren’t supposed to touch them, why don’t they put them in glass cases?” Her mother says, “Sometimes its nice to be able to get close to them.” They look again in the cases then walk back along the parade with the older girl. One of them comments on the giraffe. They move on.

***Appendix 11. All interview codes from NVivo***

Acting or pretending	Concern for animals	Pitt Rivers
Asking to stop	Conversation in museum	Previous experience
Asserting against parent	Crystals	Reason for visiting
Attractive	Damage to object	Reflecting on memory
Baby	Dark	Remembering (not in picture)
Behaviour – biting or eating	Death	Researcher choosing picture
Behaviour – fighting, chasing, attacking	Doesn't know what it is	Scary
Behaviour – hiding or protection	Family – other	School
Behaviour – maternal	Favourite	Self
Behaviour – movement	First visit to OUMNH	Shape
Behaviour – noises and sounds	Forgetting	Sibling influence
Behaviour – other	Friends	Small
Big	Funny	Sparkliness
Body – Attack	Good like nice	Storytelling
Body – Body	Interesting	Stranger
Body – Bones	Is it real	Suggestion to improve museum
Body – Face	Knowledge	Talking about themselves
Body – Movement	Love	Technology problems
Body – Skin	Misunderstanding the researcher	Television or film
Books or magazines	Museum space and building	Texture
Child & camera	Name of object	Touch
Child learning	New experience	Toy or object at home
Child's theory	Not remembering	Unpleasant
Colour	Noticing details	Variety
Comparison	Other museums	Visited OUMNH before
	Pattern	Wrong word
	Physicality	

## ***Appendix 12. All observation codes from NVivo***

'Real' or 'dead' or 'alive'	Mood – interested
Active looking	Mood – relaxed
Adult drawing attention	Mood – scared
Adult holding child	Naming
Adult in charge	Naughtiness
Adults unaware of child experience	Negative mood
Child asking questions	Photography
Child drawing attention	Physical discomfort
Child leading the way	Playing
Children interacting with each other not adults	Power battle
Descriptive speech	Reading labels
Humour	Referring to media or previous experience
Interacting with other visitors or me	Scary animals & teeth
Learning conversation	Social or imaginative interaction with animal
Mood – annoyed	
Mood – bored	Touch and not touch
Mood – enjoying company	Trail sheet
Mood – excited	

### ***Appendix 13. All photograph tags from DevonThink Pro***

All words and phrases used to tag photographs in DevonThink Pro. The ‘uses of tag’ column refers to the number of photographs labelled with that tag. The ‘levels’ refer to the subsets of tags (e.g. ‘Bird’ is a subset of ‘Animal’, and ‘Albatross’ is a subset of ‘Bird’) which allows a grouping of tags and themes. Tags are ordered alphabetically by level.

<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Uses of tag</b>
Aged 4				752
Aged 5				847
Animal				1117
	Amphibian			10
		Frog		6
	Bird			139
		Albatross		5
		Crow		3
		Crowned pigeon		3
		Diver		1
		Dodo		13
		Ducklings		1
		Emu		3
		Falcon		6
		Hoatzin		1
		Hoopoe		2
		Jay		1
		Kingfisher		3
		Moa		3
		Ostrich		11
		Owl		18
		Parrot		9
		Partridge		1
		Passerine		2
		Peacock		2
		Pelican		3
		Penguin		5
		Pheasant		14
		Pigeon		3
		Scarlet ibis		1
		Shoebill		7
		Spoonbill		1

	Storm petrel	1
	Swift	1
	Tit	1
	Toucan	2
	Vulture	5
	Turkey	1
Fish		77
	Anglerfish	1
	Arawana	1
	Bichir	1
	Cod	1
	Coelocanth	2
	Flying fish	2
	Koi Carp	3
	Longnose gar	1
	Lungfish	1
	Paddlefish	9
	Parrotfish	4
	Pufferfish	13
	Rainbow trout	1
	Salmon	7
	Sawfish	1
	Shark	2
	Tarpon	5
	Trout	3
	Tuna	16
Human		26
	Hominid	2
Land invertebrate		105
	Insect	93
	Ant	2
	Bee	11
	Beetle	20
	Butterfly	19
	Cockroach	9
	Fly	7
	Leaf bug	2
	Locust	1
	Mosquito	3
	Moth	1
	Stick insects	7
	Wasp	4
	Millipede	1
	Scorpion	2
	Spider	6

	Tarantula	4
	Worm	6
Mammal		320
	Aardvark	3
	Anteater	6
	Armadillo	1
	Badger	4
	Bandicoot	1
	Bat	2
	Bear	3
	Beaver	4
	Bison	1
	Boar	5
	Capybara	4
	Cetacean	5
	Cheetah	23
	Deer	11
	Dolphin	2
	Echidna	3
	Elephant	22
	Flying squirrel	6
	Fox	14
	Giraffe	6
	Hare	11
	Hedgehog	1
	Horse	30
	Hyena	5
	Irish Elk	1
	Jerboa	1
	Kangaroo	5
	Kinkajou	1
	Koala	4
	Lion	2
	Lynx	5
	Mole	1
	Moose	1
	Mouse	1
	Mouse deer	2
	Mustelid	1
	Otter	10
	Pangolin	1
	Polecat	1
	Possum	4
	Prairie dog	2
	Primate	40

	Bush baby	2
	Chimpanzee	5
	Galago	1
	Gibbon	1
	Gorilla	3
	Lemur	4
	Monkey	24
	Orangutan	1
	Rabbit	14
	Rat	3
	Red panda	5
	Rhino	2
	Sloth	1
	Sperm whale	7
	Squirrel	2
	Tapir	1
	Tasmanian devil	2
	Tasmanian tiger	1
	Tree shrew	3
	Wallaby	8
	Walrus	3
	Whale	2
	Wolf	10
	Wolverine	6
	Wombat	1
	Woodchuck	3
Marine invertebrate		36
	Cephalopod	4
	Crab	18
	Spider crab	14
	Jellyfish	1
	Lancelets	1
	Lobster	2
	Sea cucumber	2
	Sea spider	1
	Sea squirt	1
	Star fish	4
Prehistoric		355
	Prehistoric mammal	10
	Deinotherium	10
	Prehistoric other	56
	Ammonite	42
	Trilobite	1

Prehistoric reptile	278
Archaeopterix	5
Baby dinosaur	10
Camptosaurus	2
Cetiosaurus	4
Compsognathus	10
Edmontosaurus	9
Eustreptospondylus	17
Ichthyosaur	14
Iguanodon	40
Jurassic crocodile	11
Megalosaurus	7
Mosasaur	3
Pachycephalosaurus	1
Pleiosaur	9
Plesiosaur	27
Pterosaur	11
Struthiomimus	8
T. rex	66
Triceratops	9
Utahraptor	20
Velociraptor	5
Reptile	71
Crocodile	34
Big croc	16
Lizard	8
Snake	10
Tortoise	8
Turtle	11
Baleen	2
Boy	760
Amar	28
Brendan	36
Daniel	41
Fred	28
George	219
Greg	35
Haden	40
Harvey	33
Jack	15
John	68
Josh	40
Justin	26

	Kiet	27
	Kyle	25
	Oscar	64
	Rhys	35
Building		28
	Door	1
	Floor	6
	Floor grate	3
Case		880
Cave		2
Claws		3
Coral		1
Dinosaur bone		1
DNA		2
Dry specimen		50
Earth		1
Egg hunt		1
Eggs		30
	Bird eggs	8
	Crocodile eggs	2
	Dinosaur eggs	13
	Snake eggs	7
Elee		3
Feather		2
Footprint		15
Fossil		120
Free-standing		206
Fuzzy		40
Girl		839
	Ally	37
	Amy	67
	Anna	162
	Bonnie	10
	Caroline	58
	Clara	19
	Delia	24
	Eloise	135
	Imogen	30
	Irena	87
	Karen	40
	Maisie	7
	Marie	63
	Miriam	44
	Nina	47
	Shama	9

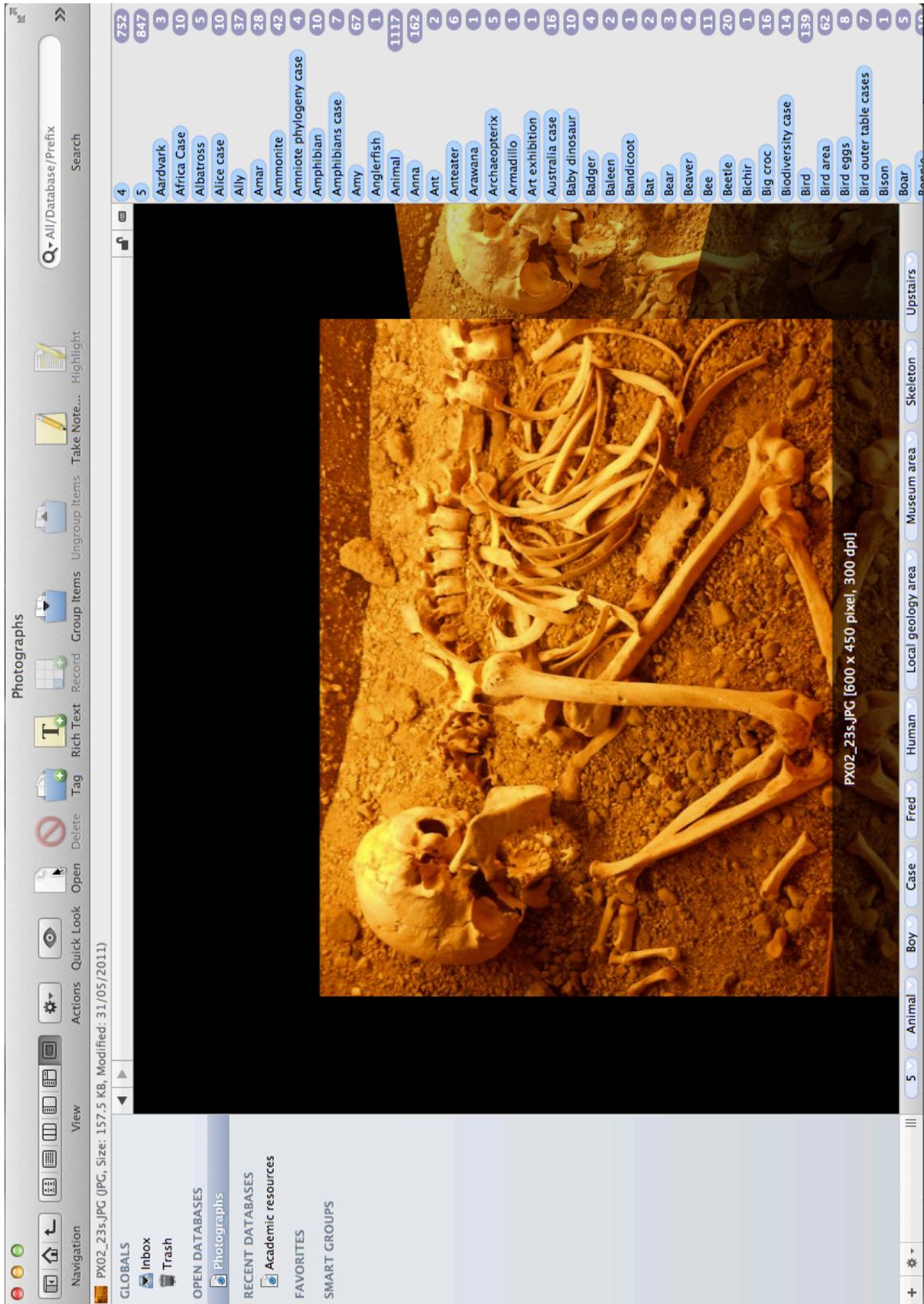
Handling	227
Hanging	5
Head	47
Interactive	2
Microscope	1
Interview	266
Invertebrate	141
Jaw	13
Live	29
Mineral	229
Crystals	96
Desert rose	1
Diamonds	2
Geode	6
Malachite	6
Meteorite	15
Mineral cube	6
Petrified	27
Petrified tree	13
Precious stones	12
Pyrite	17
Quartz	9
Rock	34
Rock square	4
Stalactite	2
UV	31
Model	168
Mountain	1
Museum area	1521
Downstairs central	1109
Bird area	62
Bird outer table cases	7
Flight case	3
Non-passerine case	3
Passerine case	2
Central court	214
Alice case	10
Biodiversity case	14
Buckland case	18
Camptosaurus case	2
Cetiosaurus case	4
Dodo case	12
Eustreptospondylus case	17

	Footprint case	14
	Iguanodon case	11
	Insect case	8
	Megalosaurus case	8
	Mineral case	18
	Downstairs handling points	219
	Handling tables	106
	Mineral handling	64
	Fish, amphibians & reptiles area	148
	Amniote phylogeny case	4
	Amphibians case	7
	Cartilaginous fish case	2
	Crocodiles case	9
	Euteleosts case	23
	Evolution of fish case	8
	Lizards & snakes case	10
	Lobe-finned fish case	4
	Ray-finned fish case	13
	Turtles & tortoises case	5
	Vertebrate phylogeny case	9
	Mammal area	139
	Africa Case	10
	Australia case	16
	Laurasia case	28
	Mammal outer table cases	17
	Parade	26
	South America case	18
	Mineral area	83
	British minerals preserved case	12
	Earth's building blocks case	3
	Finding out about minerals case	8
	Industrial minerals case	2
	Metallic ores case	1

	Minerals from fire case	4
	Moving earth case	4
	Rocks from space case	7
	UV booth	31
	Prehistoric reptile area	166
	Ichthyosaur case	3
	Mosasaur case	3
	Plesiosaur case	18
	Prehistoric crocodile case	9
	Pterosaur case	11
	T. rex case	15
	Raised ledge	42
	Rock table cases	25
	Temp Exhib	10
	Downstairs outer	171
	Children's activities area	17
	Drawers	16
	Evolution area	28
	History of life area	22
	Invertebrates table cases	43
	Primate area	59
	Pitt Rivers	32
	Upstairs	211
	Art exhibition	1
	Botany area	17
	Insect area	91
	Local geology area	23
	Minerals ledge cases	25
	Mollusc ledge cases	6
	Precious stones cases	13
	Upstairs extra cases	25
	Diorama	17
	Victorian bird case	2
	Upstairs handling	6
Nest		15
	Wasp nest	7
Objects		21
Person		314

Family	41
Photography	11
Pointing	2
Touch	35
Photo technique	426
bottom of case	163
middle of case	181
Selfie	2
top of case	46
turned camera	28
whole case	18
Picture	52
Plant	16
Pine cone	4
Predator	273
question area	2
Sculpture	1
Seeds	1
Severed hand	4
Shell	19
Shop	2
Skeleton	210
Vertebra	1
Skull	65
Spiral	51
Stamp	1
Sun	2
Swift TV	1
Taxidermy	438
Teeth	129
Tusk	1
Venus	1
Volcano	1
Wet specimen	15

## Appendix 14. Example screenshot from DevonThink Pro



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