

THE MAKER OF IMAGINARY WORLDS

Interactive Theatre for Early Years

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ABSTRACT

A young child is competent, capable and a citizen with equal rights to cultural activities. Our fundamental values and attitudes to very young children are the critical determining factors in the quality of their sociocultural lives. Very young children are considered spectators in their own right; however, in the UK there are still only a few theatre performances exclusively made for children under three. This research addresses this issue by investigating the relationship between physical and digital scenography to make Theatre for Early Years (TEY) more interactive and sensory. It begins from a child rights perspective that recognises the child's voice, perception, perspective, sensory ability. It establishes how a multidisciplinary approach drawing from the fields of Education, Human-Computer Interaction (HCI) and Theatre demands that we rethink our approach to making children's theatre by establishing a dialogue with our audience and building in interaction from the outset. TEY is an emerging field of practice and research. This thesis focuses on the design and the analysis of interactive scenography for two TEY performances at Lakeside Arts Centre, Nottingham, attended by toddlers and their grown-ups. Multisensory design plays an essential role in TEY because young children predominantly make meaning through directly sensing and interacting with their world. We still have a lot to learn about how children make sense of performances. I argue that embedded digital, tangible and interactive scenography can create hybrid performances that support agency, play and real-time interactions in TEY while still serving its purpose as a scenographic element. The design approach considers technologies as both functional and aesthetic, and the scenographic object as a character and audiences as an integral part of the performance. Participatory and interactive experiences afforded by open-source technologies can open up new perceptions, not only in respect to TEY performances but, for the design of flexible, interactive spaces for children's play.

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GLOSSARY

Article 31, UN Convention on the Rights of the Child-‘Every child has the right to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts’ (Foundation, 2006).

End-on- A traditional staging where the audience is seated in front of the theatre stage.

Installation- Artistic work that is designed for a particular space or room; it can include the use of audio and video to create an immersive experience.

Physical theatre- A theatre where the body and gestures are emphasised as the primary means of communication as opposed to the verbal.

Object theatre- As a subset of puppet theatre, it involves the manipulation of found or real objects to create anthropomorphic puppets that have agency.

Promenade theatre- Is a theatre genre where the audience members take a journey through walking from one scene to another rather than only sitting. The audience shares the same space with the performers, and the action happens around them watching.

Site-Specific theatre- A theatre production that takes place and responds to a non-theatre space. The audiences sometimes participate in the play and the design often responds to the history and physical location.

Scenographer- A theatrical designer who is responsible for the visual elements in a performance and as a member of the creative team she may work closely with a director to develop the designs for the stage, props and costumes.

TYA (theatre for young audiences)- Performance made especially for children and includes all theatre genres- such as dance, physical theatre, mime and circus.

TEY (Theatre for Early Years or Theatre for the Very Young, or TVY)- A subset of TYA. Professional theatre led by adults and made for children under six years old accompanied by a parent or adult companion. Performances are often pitched to a particular age group, for instance under 12 months or Theatre for Babies, Theatre under three years old -toddlers or children above three years old.

TiE (Theatre in Education)- It is a tool to help in the educational process. Children are actively involved and learn and discover through the use of interactive theatre/drama practices.

Chapter 1 INTRODUCTION

'The young child as a "Maker" of imaginary world, is a kind of poet and is in command of considerable intellectual resources, developed and exercised by such imaginative world.' (Egan 1999, p. 29)

1.1 Research Context

Since the beginning of the millennium, theatre artists have sought to actively include the youngest members of our society (0–6 years) in their work and to expand the margins and concepts of traditional theatre for a young audience (TYA). Theatre for Early Years (TEY) is now a firmly established genre. However, society, academics and the media still have difficulties valuing and acknowledging children's theatre as a legitimate form of artistic expression (van de Water 2012; Gardner 2013; Juncker 2012; Koch 2017). Children's arts and culture are undervalued and too often seen as a cultural investment for future adult engagement in the UK. The influence of developmental psychology on early years social and cultural policies means that there is often an emphasis on future skills and not about how we enrich children's lives in the present (Young and Powers, 2008; Broadhead and Burt, 2011; van de Water, 2012). Van de Water emphasises that TEY is reliant on the value placed on arts and childhood in a particular country as a 'luxury' or a 'right' (van de Water, 2012, p140).

All children have the right 'to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts' (UN

Committee on the Rights of the Child/UNICEF/Bernard van Leer Foundation, 2006 p. 63, Article 31). The implementation of very young children's cultural rights (Article 31) or rights in general, is complicated. For instance, the United Nations Convention on the Rights of the Child (1989) is the catalyst for shaping more robust policy agendas for all children. However, it was not until 2005 that the UN recognised that Member States' reports often overlooked very young children. As a result, general comment No. 7 'Implementing Child Rights in Early Childhood' was included to clarify the interpretation of the rights of very young children. It aims to improve the quality of children's early experiences (Bernard van Leer Foundation, 2006).

The image of a child, who has rights, is competent, ready to learn, explore and interact with the world, forms the basis of contemporary thinking and policies about early childhood (Woodhead, 2006). Nevertheless, the traditional notion of the child as both 'innocent and ignorant' in the state of 'becoming' rather than 'being,' a deficient 'empty vessel' waiting to be filled still persists but is slowly changing (Qvortrup, 1994; Fawcett, 2009, p. 27). A growing body of scientific evidence in neuroscience (Bruce, 2004), sociology of childhood, and education (Qvortrup, 1994; Fawcett, 2009) sheds light on the significant role that all types of play and playful activities can have on children's cognitive development and social competence (Broadhead and Burt, 2011). The impact that supportive, sensory and stimulating environments can have on children under three that predisposes them to learn cannot be underestimated (French, 2007).

In the UK, this evidence has led to policy changes, significant local research, support for early years care and changes in pedagogy approach in preschools and nurseries (Nutbrown, 2010). Many initiatives in early childhood studies (Athey, 2007) have demonstrated the competency of children and have had a positive influence on their care and upbringing. Early Learning Goals (national curriculum guidance) now support and see play-based learning as central to early years practice (Broadhead and Burt, 2011). Nevertheless, despite these changes to the first years' landscape, in practice, how childhood is valued, understood and experienced vary widely due to the complexity of altering traditional methods and the minority status that children still hold in our society (Sgritta, 2002, p. 254). Society can be judged not by what it says

about children, but what it ‘offers’ to them (Goldschmied & Jackson, 1994, p. 1). The very conditions in which very young children can fully realise their rights to arts and culture are dependent on the value, quality and consistency of the provisions provided by the government and other funding agencies; to educate parents and cultural providers that Article 31 is as fundamental as any other right. It has been a challenge because art and culture are regularly considered a ‘dispensable component’ not only in the UK but worldwide (Sharp and Métais, 2000).

However, the shift in the discourse signifies the ongoing change in social attitude to children’s cultural entitlement from birth – the growing recognition of the child as ‘social actors’ (Belloli 2011; Shaw *et al.*, 2011 p. 4). The legitimising of TEY can come with visibility. The steady increase in research publications, performances, theatre festivals and networks in the last decade, has gone some way in developing a small TEY community in the UK. Since 2005 the ‘Small Size’ system of theatres and cultural centres from 15 different European countries including the UK have received European funding to facilitate and support exchanges between TEY practitioners and researchers (Belloli, 2011). The value the media places on children’s theatre can affect how it is seen and valued in society ‘...what is reviewed in our culture quickly becomes what is valued in our culture’ (Gardner, 2013). In 2017, theatre for babies went mainstream when Improbable Theatre and Scottish Opera toured ‘Bambino,’ an opera for children under two. When popular companies who usually do not make shows for children do, it increases the media exposure and visibility of TEY.

The Arts Council, England is investing in new or refurbished theatres for young audiences, notably Unicorn Theatre (2005) and Theatre Hullabaloo (2017) the first children’s theatre in the North of England and Polka Theatre (2019) and is committed to developing and supporting TEY. However, in practice, there are still only a few regular performances for children under three and even fewer that are fully interactive in the UK. Traditional theatre formats do not adhere to a child’s rights ‘to participate and engage in play and recreational activities appropriate to the age of the child’ (Bernard van Leer Foundation, 2006). Children under three are a challenging audience; they are unpredictable; they lack awareness of traditional theatre conventions. There are considerable differences in the development between a one-

and a three-year-old child, and it is essential to recognise these existing limitations and complexities; however, this should not be taken for granted and be an excuse for a lack of high-quality provisions. Early childhood provision in the UK recommends that very young children experience the world through play. Economic reasons are often quoted for the lack of interactivity and theatre provisions. 'Bums on seats' takes precedent over experimentation, so there tend to be more performances targeting children aged three and over (Ball *et al.*, 2007). Practitioners need to fundamentally rethink traditional approaches and question artistic values in light of what we currently understand about very young children. So how can theatre practitioners overcome this tendency of the unfamiliar and help to develop TEY? One of the answers lies in support through research and extensive knowledge exchanges about the techniques and experiences of theatre practitioners and researchers. It is only in the last decade that a few books and journal articles addressing TEY were published (van de Water, 2012). More research is required to establish its value. Matarasso and Landry (1999) argue that 'the cultural sector cannot rely any more on a presumption of its worth' (Matarasso and Landry, 1999, p. 17).

Looking at alternatives and non-traditional theatre formats may hold some promise. The unprecedented popularity of immersive and interactive theatre experiences for adults in the last decade has attracted new audiences that do not usually attend the theatre. Theatre practitioners have developed new techniques and opportunities for the adult audience to experience theatre, which involves playing a more active role (Machon, 2009). Some European TEY companies are experimenting with participatory methods (Nagel and Hovik, 2016) and in the UK children theatre companies like Oily Cart and Starcatchers make immersive participatory and promenade theatre for very young children.

Very young children are the audiences of today, and we cannot deny the affinity and relevance of digital technologies on their play culture, considering its increased prevalence. Arts research funding opportunities have also caught up with popular culture with a recent call from the Arts and Humanities Research Council and Innovate UK for research in 'Immersive experiences and digital' (UKRI). Digital and interactive technologies can potentially be used to make TEY more participatory and interactive;

the shift from looking to interacting with digital technology is all too familiar to very young children in the UK (Marsh *et al.*, 2015). They have more access to digital and mobile technologies in their play culture – tablets, digital applications, robotic toys that can interact and react to every action. From a child’s point of view, ‘play culture, and the media are inextricable from one another’ (Mouritsen, 2002, p. 20). However, TEY theatre scenography is still usually static and is not designed for audience interaction. Digital technologies could help support direct modes of communication between the audience and the performance and help make scenography more dynamic. Only a few performances in Children’s Theatre employ interactive technologies, and most of them use interactive walls or floor projected images (TPO Company). While these can create an embodied experience and are fun, playful and enjoyed by children, their modalities are limited, and there is a lack of tactile and tangible sensory objects, and it can be very costly.

Embedded technologies have become more widespread in early years toys. The popularity of interactive applications on tablets and computers amongst children under three is growing. They seem to be drawn to the interactive, playful nature of the applications. Research in the field of Interaction Design for Children (IDC), encompasses children’s use of technologies from entertainment to education. Like in TEY, designing for early childhood is an emergent area of research in human-computer interaction (HCI), and there are only a few current studies of how very young children use tangible technologies. The nature of tangible digital technologies can help theatre practitioners develop more interactive shows without losing the visual and tactile aesthetics of TEY. When thinking about what technologies are useful, consideration of the economic challenges faced by TEY and theatre makers should be taken into account. Children’s theatre companies have small budgets; therefore, open-source hardware and software could potentially create more embodied mixed reality experiences that are affordable. Open hardware and software electronics and wearable technologies are used by many visual and digital artists to create an interactive art installation in public spaces (Bech, 2016). They are popular because they are low cost, readily available and versatile and have open online support communities. When thinking about the situation of children’s theatre companies,

these technologies can offer one route to making TEY more interactive and potentially move audiences from being observers to the ‘players.’

This research primarily involves the interrelationship of three fields: Theatre for Early Years, Early Years Childhood Research and Interaction Design for Children. It investigates interactive scenography and performance for TEY through two performances attended by very young children and their grown-up companions.

1.2 Research Statement & Objectives

In light of the previous discussion, this thesis explores how scenography and open-source hardware and software could contribute to making TEY interactive and facilitate and support activities that foster young audience participation. Its focuses are on how interactivity can create new modes of narrative, multisensory experiences and play. It aims to expand scenography practice and potentially help practitioners working in TEY. Central to the research are the experiences of the children, their grown-ups and their role in shaping interactivity in theatre. My objectives are:

- To design the scenography for two performances using open-source hardware and software and discuss the implication for TEY.
- To analyse and evaluate the audience and performer experience and the role of participation in interactive performances.
- To assess the role of interactive scenography in enhancing the narrative and audience experience.

Research Questions

The thesis poses three research questions:

1. How can scenography be made interactive using digital and tangible technologies in theatre for early years?
2. What role do the scenography and performer have in helping support and encourage audience participation in theatre for early years?

3. How can interactive and multisensory scenography enhance the narrative experience for the audience?

1.2.1 Approach

This research uses multiple method approaches that combine practice-based and qualitative research methodologies as an overarching research strategy. The approach draws from theatre, scenography, digital making and design and early years education to design and produce two installations/performances. To achieve the objectives and answer the research questions raised in the previous section, two research studies of the performances were undertaken. By focusing on multiple sources of evidence from studio practice, participatory research, interviews, surveys and observation, I adapted Schemas or children's play patterns (Athey, 2007), a tool used in Early Years education into a framework for design and analysis.

TEY performances are for children aged zero to six years which are subdivided into several categories connected to early years developmental milestones. The most common groups used are theatre for babies 0–12 months, theatre for under 36 months (toddlers) and theatre for over three years. The two TEY installations/performances developed through this thesis were attended by children aged between 14 and 48 months and their grown-ups, and most of the children were between 18 and 36 months. The next section is a summary of the installations/performances and study undertaken.

1.3 *Into the Woods* – Performance Design and Study

Into the Woods is an interactive performance/installation designed and built by the researcher and took place at the Nottingham Lakeside Arts Performance Arts Studio in Nottingham. It was an experimental performance designed to observe and study open-ended play, interactive/digital experiences and improvised performance with very young children between the ages of 14 and 48 months and their grown-ups. Eight performances took place over two and a half days, and 40 children and adults attended. The 45-minute performance/installation was improvised and child-led. At the start of a performance, the performer greeted the audience and ushered them into the studio space, and they had the freedom to explore the interactive scenography.

The scenography design process included consultations with a creative team of researchers, arts venue personnel, an object theatre artist and the performer. The research study involved recording and analysing the actions, interaction and play patterns of the participants during their 45-minute experience. These actions included nonverbal cues, such as gaze patterns and body orientation.

1.4 *The Runaway Hare* – Performance Design and Study

The Runaway Hare is an interactive promenade performance that took place at the Lakeside Arts Performance Arts Studio in Nottingham. There were six performances over two days in January 2017, and a total of 29 children and 33 adults attended.

The designs drew on the findings from the first study and refined the scenography and digital technologies to create a narrative sensory experience. Compared to *Into the Woods*, *The Runaway Hare* was a more structured performance and drew on the traditions of promenade theatre and storytelling. It experiments with various modes for audience interactivity within a promenade performance. It explores how the scenography and performer could facilitate interactions during a performance.

The narrative drew on 'hide and seek' adventure stories which are popular with very young children. The audience journey begins in the meeting room next to the performance studio. The performer introduces the story and takes the audience on a journey to find her friend the hare. They visit The Magic Tree, the Sound Meadows, the Shadow Dome and the Giant Flower. Each scene reveals more clues about the hare; the children eventually found it inside the giant flower. Then the audience is permitted 20 to 30 minutes of open-ended play. The performance experience ends with the audience being led back into the meeting room to put the tired hare to sleep.

The scenography is designed and made by the researcher, in consultation with the same creative team as in the first study. The studio design process included developing a narrative and experimenting with the play pattern design framework, the scenography and interactive elements. Like the first study, each performance was recorded, and the video data reviewed, and significant vignettes were selected for further analysis.

1.5 Motivation

This research draws on my practice in Scenography and Digital Art. Since 2000 I have worked as a professional Scenographer and have designed work for site-specific performances, projection designs, touring theatre and digital installations in the UK and Europe. My creative work lies in non-traditional and alternative theatre. The Victoria and Albert Theatre Museum in London acquired my site-specific designs for the *Tempest*, Corcadorca Theatre, Company in 2008 for their permanent collections.

Scenography is integral in most performances, and my designs have been predominately for adult theatre. The designing process usually involves working with the creative team and developing and implementing scenography and costumes for a play; developing the performances for this research project is a departure from my usual work in theatre. My first experience of TEY was when I took my nine-month-old daughter to a performance. Since then, we have seen over 60 performances. As I became more adept at finding the best theatre children's companies, our journey took us across the UK. The experiences prompted me to reflect and question my scenography practice and attitude to children's theatre. The initial motivation for taking my daughter to the theatre was pedagogical. As a scenographer, I never considered working in children theatre. The more TEY performances I saw, the more I appreciated the value of storytelling and the high quality of design, especially in work from European theatre companies. However, from all the performances we saw only a few were for under three's, the stories were usually adapted from a popular children's book and had traditional staging ('end on'). The youngest children were often restless, and the performer's invitations to participate often felt tokenistic. Children were not always compliant, they often crossed the boundaries, made calls to attract the performers' attention after the lights are dimmed, leaving the performer the options to either gesture to them to be quiet or to ignore their 'intrusions'. The children wanted more. Incorporating audience participation is complicated and requires negotiation.

Nevertheless, a few children's companies such as Oily Cart and Compagnia TPO's experimental audience approach and scenography were inspiring. When my daughter was three years old, we attended a performance by the Italian theatre company

Compagnia TPO at Lakeside Arts. My daughter is shy and very cautious around new people, and at this interactive digital performance, groups of children were invited to go onto the stage without grown-ups. She readily complied – her enthusiasm and readiness a great surprise as she was led by dancers and interacted with images on the floor and screen. Four years after she still remembered the performance; it was as if embodied actions and the performative acts on stage stayed with her. I became more fascinated by the idea of interactivity and the potential of digital technologies. On reflection, this experience and other interactive performances have motivated this research to develop interactive scenography and performances for children. The question that intrigued me then and still does now is what transformative elements of the interactivity could create a sense of autonomy that propels a child out of her shell (public persona) to have the courage to interact? Was it fun, novelty or embodied experience? It is with a growing passion for children's theatre that I embarked on this research; to find out how I can contribute to the ever-increasing quality and variety in children's theatre.

1.6 Thesis Outline

Chapter 2 defines the related research and works that support and influence the research approach and how the research questions have evolved. It engages and brings together several practices: theatre for early years (TEY), early years/childhood studies, human-computer interaction (HCI) and creative arts (scenography, theatre and art).

Chapter 3 provides the motives for using a mixed-methods approach that combines practice-based research and qualitative practices and the adaptation of early years practise within the methodology framework – in particular, the play pattern design framework. It also reflects on any issues I have encountered and biases that have occurred in adapting these methods for the work in Chapters 4, 5, 6 and 7.

Chapter 4 addresses the first research questions through an experimental studio design process for the *Into the Woods* installation for children. It reviews the visual design process and explains how the play pattern design framework was used with scenography practice.

Chapter 5 studies the *Into the Woods* interactive scenography and open play installation which provided a platform for observing how children and performers interact, how children played with the digital props, what caught their attention and why. It reflects on the value and issues of using schema framework and aspects of alternative theatre and the installation format discussed in Chapter 3, what I learnt and how to improve the design and experience for the next study described in Chapters 5 and 6.

Chapter 6 traces the design process for *The Runaway Hare* performance – a more concerted effort to use the schema, create a professional production. It follows how I chose the story and format and, design ideas, extended from the work discussed in Chapters 4 and 2. It reflects on the design process, the issues I confronted and how it could be improved.

Chapter 7 builds on Chapter 5 and further addresses the research questions by testing the design ideas in performance. The findings are discussed – the study, survey and observation of the children, adults, performers – and the design of *The Runaway Hare* if reflected upon.

Chapter 8 discusses the results of the studies of the two performances and the implications for interactive theatre, then outlines the elements of an interactive TEY model for designing interactive scenography and performance and finally discuss the audience and performer's role in participation and interaction.

Chapter 9 concludes by making a case for interactive TEY that uses technology. It outlines the implications of the research and addresses the research questions, the issues for future TEY practice and discuss the contributions of the thesis to theatre and HCI, and finally how the thesis affects my scenographic practice and what is next.

Chapter 2 TEY FOUNDATION

This chapter aims to map the territory involved in this thesis. Since the twenty-first century there have been significant paradigm shifts in how digital technology is apparent within our culture; however, these shifts can be traced to art practices created over a century ago. This review engages and brings together several practices, Theatre for Young Audiences (TYA), Theatre for Early Years (TEY), early years/childhood studies, human-computer interaction (HCI) and creative arts (scenography, theatre and interactive art). Focusing on the common strand in these practices and their significance in developing this research, it explores the intersections and specific crossovers to demonstrate how these subject areas can come together, starting with the young audience.

2.1 Early Years Audience

Young children have attended theatre productions as audience members with grown-ups as well as performers on stage as actors for centuries. However, it was only in the 1900s that theatre for children became a concept. The first theatre for children opened in 1903 Hert's Children Educational Theatre (van de Water, 2012). Unlike adult theatre, children's theatre was originally associated and framed within an educational, social and moral context. It became associated with amateur theatre as the children above six years old (school age) and the adults that performed were not theatre professionals (van de Water 2012, Reason, 2010). The post-war period in the 1950s brought about a rise in professional children's theatre companies that toured the UK. They were not associated with education and strived to be recognised as professional theatre along with adult theatre (Bennett, 2005). Theatre Centre and The Unicorn (still around today) were at the forefront of these developments in British Children's Theatre, together with Arts Council England funding incentives for TYA (Bennett, 2005). There are two main TYA branches in our current cultural climate,

professional theatre for TYA takes many forms from large-scale musical theatre to small school touring productions. Theatre in Education (TIE) is also a recognisable strand of TYA that is supported by theatres, schools and community groups. However, although TYA is thriving, theatre for children aged zero to six years is a more recent phenomenon.

Since the beginning of this century, TEY or TVY (Theatre for the Very Young) has become a recognised global art form although it has been around for 30 years (van de Water, 2012). In the first decade, there were just a few companies in the UK, Italy and France making shows specifically for children under six. In the last decade, many companies began making performances specifically for children aged zero to three. Theatre practitioners have developed new ways to invent, create and develop the genre as well as working together internationally.

Most TEY companies tend to operate from a children's rights perspective. United Nations Conventions on the Rights of the Child (UNCRC) is a legally binding international child's right treaty. It was adopted by the UN General Assembly 30 years ago in 1989 and 194 countries signed up. All the countries that signed up have the responsibility to and are bounded by international law to implement the UNCRC. The UNCRC is made up of 54 articles covering all aspects of children's lives such as family, freedom of expression, justice, disability, education and culture. A child is considered as anyone under the age of 18 (Article 1). The UNCRC emphasises that all the rights must be seen as equal and should apply to all children whatever their family background (Article 2) (Schneider, 2013; Fletcher-Watson, 2015). Article 31 is commonly referred to by TEY and other cultural organisations as it concerns a child's rights to a range of leisure, play and cultural activities. The shift in the international discourse was slow but it signified the ongoing change in our social attitude to children's cultural entitlement from birth – the growing recognition of the child as a 'social actor' with a unique perspective, rights and competences with 'insight into their own reality' (Belloli, 2011; Shaw *et al.*, 2011, p. 4).

The persistent vision of the powerless and passive child still underscored the rights to culture for the youngest in our society. The value of theatre for the very young was

questioned by cultural organisations, and the first TEY practitioners worldwide were met with scepticism. This scepticism could be founded in the audience's experiences, where younger children did not adhere to theatre conventions, *i.e.* sitting quietly in silence in a performance not explicitly made for them (Taube, 2009). The reasons for this scepticism are not straightforward, and the deep-rooted thinking of young children as becoming and not being takes time and more importantly evidence in order to change the current mindset. We all have experience of disbelieving in things or a phenomenon until we have experienced it (Trevvarthen, 2010).

The biggest transformation in the development of TEY was how things were done. TEY productions that considered the audience's age and their abilities demonstrated to theatre practitioners and producers the value of theatre for the youngest. The young audiences' engagement revealed to the sceptics a way to imagine, to see, that was previously unthinkable (Schneider, 2009). The experience was of how young children communicate and how theatre practitioners responded to this engagement/conversation, which is key to making TEY. A theatre production that brings the presence of the child's voice – their perception, perspective, sensory ability and experience – means we have begun a cultural conversation with them about their rights, needs and desires.

2.1.1 The Communicators

Young children are communicators; they are born with 'self-awareness and the vitality of self-expression' (Trevvarthen, 2018, p. 31). Egan (1999) points out that by considering young children 'illiterate and lacking in skills of Western rationality,' our judgement is often clouded. He argues that we still think of children as lacking and we should consider them 'as oral in a positive sense' with their own 'distinct culture' (Egan, 1999, p. 28). So, what is oral culture? The tools of the poet 'sensitivity of words and their emotional effect, the precise use of metaphor, the arrangement of sound in metrical patterns, the use of rhyme, story shaping of narrative' (Egan, 1997, p. 29). For example, communication/the vocal patterns exchanged between mothers/carers and babies were found to have 'communicative musicality' and parent and babies both use an expressive face, voice and hands to 'intimate musicality'. These studies used an acoustic analysis computer program to map the interactions; the results

demonstrated features of oral culture that Egan refers to in the precision of timing and rhythm between the parent and child (Malloch and Trevarthen, 2010, p. 56). Responding to parents is innate to very young children and is a natural and instinctive way to communicate with the world around them. The connectivity between a parent and a child are reciprocated through their sensitivity of words and emotions, relationship, and turn-taking; these are the foundation of children's play which is discussed next.

2.1.2 Play

For children in all cultures play between a mother and child suggests universality in play. Studies of twenty-month-old children in different countries around the world found there are few cultural differences in exploratory and symbolic play. However, the approaches to free play differed – in some countries, play is more child-led, and in others it is more adult-led (Goldstein, 2012), reflecting the differences in how theatre is perceived. Young children find play exciting, and it is one of their primary means of expression. Until around the age of seven children's brains are like 'a sensory processing machine' (Ayres, 2005, p. 10). They primarily make meaning through directly sensing and interacting with the world. Strong sensory integration is a basis for all intellectual activities (Brierley, 1994). Play and imagination help children to feel empowered. It permits them to move between their real and imagined worlds (Sutton-Smith, 2001). They can take charge and be in control. The arts place a high value on the imagination, and it can affect the way we respond (Di Benedetto, 2010) and has strong emotional effects, once it assumes 'material form'. They can become just as real as other things (Vygotsky, 2004, p. 14). A one-year-old child can show signs of symbolic communication, for instance, naming objects from a recalled shared experience and giving meaning to their experience (Trevarthen, 2018). A two-year-old child gains confidence, responsibility, values affectionate friendship, communicates with peers and creates 'acts of meaning' using objects (Trevarthen, 2018, p. 25). They are naturally curious and programmed to explore and master their world (Winnicott, 2005), and how they play with objects through trial and error, imitation and imagination are significant and age-dependent. A one-year-old will usually imitate how an object is used, while by two years, the same object becomes

disassociated from reality, and its purpose becomes imaginative (Weininger, 1986a; Vygotsky, 2004). Weininger furthers this notion by proposing that pretend play is the effect of an ‘as if’ situation while the imagination is the ‘what if’ or the thinking function behind pretending play (Weininger, 1986b, p25). Theatre optimises this connection of the ‘as if’ with the ‘what if’ but this can become challenging in a performance with a mixed target group.

Children’s play may sometimes seem confusing and arbitrary, but repeated observations and research have found their play reveals schemas or repeated pattern of behaviours, such as transformation, enclosure, connection and positioning (Harper, 2004; Athey, 2007; Atherton and Nutbrown, 2013). They provide early years practitioners with the tools for analysing and making sense of children’s play. They are abstract concepts based on children’s instinctual behaviour and have been adapted into a design framework for the studio research discussed in detail in Chapter 3.

How young children react when they enter a new environment can be crucial for engagement and play in any theatre or interactive experience. Researchers have found four main modes of behaviours observed in very young children when they arrive at a new environment:

- 1) *‘Watchfulness – child spends time just looking, observing the environment and other children, making sense of people and the activities, i.e. what is allowed?’*
- 2) *‘Stillness – some children will sit and watch for as much as an hour ‘taking it all in’.*
- 3) *‘Flitting – like a butterfly – handling object but not concentrating or getting involved in anything particular.*
- 4) *‘Unwillingness to engage in conversation. ‘Play safe, more listening than conversations’ (Fawcett, 2009, p. 86).*

The discussions and research in this section have demonstrated how children’s behaviours are as complex as adults. Being aware of how a child behaves, communicates and imagines through play, musicality and objects can support the way

theatre practitioners interact with them and directly influences how we design and develop interactive scenography and performance. The next section investigates the development and shaping of TEY and how theatre practitioners responded and began to develop their practice and a relationship with children.

2.2 Reinventing Theatre – A Period of Growth

Theatre for children under five can be traced to the mid-80s and 1990s thanks to four companies: Kit (UK), Oily Cart (UK, 1985), La Baracca (Italy, 1987) and Joëlle Rouland (France, 1987). However, Joëlle Rouland's *L'Oiseau Serein* (The Serene Bird), was the first performance made for children aged zero to three (Soussan and Mignon, 2008 in Fletcher-Watson, 2016). A decade of development by a few companies led to the current expansion of TEY. La Baracca's (Bologna, Italy) voice was pivotal in early expansion and developing an active community of TEY practitioners. Local educational policies played a part in the early development of quite a few TEY companies in Europe. La Baracca's success could be attributed to support gained from the socio-political infrastructure in the region of Emilia Romagna, where Bologna is located (Belloli, 2011; Mack, 2011). Its educational philosophies support child-centred play and creativity and the renowned work of the Early Years education methods of Reggio Emilia Schools. The local educational infrastructure in Belgium also actively supported the work of Théâtre de la Guimbarde (2000). Like La Baracca, they first started working in nurseries and developed training programmes for early years practitioners (Dower, 2004). The work of both of these companies has influenced a wide variety of practitioners in the UK and worldwide.

In 2004, the Arts Council England commissioned a report of these two companies to explore their way of working in Early Years settings in order to increase TEY offerings in nurseries.

In the UK there is a history of over 30 years of work with children from the ages of three to six years from both large-scale and smaller-scale companies such as Quicksilver, Polka, CTC and M6 (Belloli, 2011, p. 16) and the TEY community is slowly increasing. 'Oily Cart' is one of the oldest theatre companies and has over 25 years' experience doing work specifically for children aged between two and five years. They

are unique in making innovative theatre specifically for young children and young people with profound and multiple learning disabilities (PMLD). As a result of their work with children in special needs schools, in 2004 they began making multisensory shows for babies aged six months to two years. Their performances are interactive, multisensory and have always included strong visuals, puppetry and live music (Brown, 2012). Tim Webb, artistic director, when talking about theatre for the youngest said 'I am still astounded by the intense focus and speed of response of a neurotypical audience of babies and toddlers' (Brown, 2012, p. 9). Their work shows sensitivity to children's needs. For their first TEY performance, the company sought advice, researched ways of making early years theatre in Belgium and worked with groups of children during rehearsal (Young, 2004, p. 17). A research case study of one of Oily Carts performances 'Clouds' for children between the ages of six months and two years highlighted the need to accommodate and support adults, as different parenting styles and behaviours can lead to tensions and misunderstanding. Practitioners need to be cautious of different cultural situations about how adults and children interact, and one size may not fit all. Several challenges were identified: 1) structuring time by easing in and out of a performance, 2) children's ability to cope with the unfamiliar, 3) an emphasis on multimodal experiences; 4) the age range allows for different levels of involvement, 4) high quality in all aspects (Young, 2004, p. 17).

Although there is a variety of different practices and approaches to TEY, to copy a method that has been developed and influenced by local, social, political and economic complexities and relationships can fall into superficiality (Young and Powers, 2008). Nevertheless, there are some parallels between Young's findings and other practitioners' experiences in Europe and Australia and could lead to a model. Overall, most practitioners' experiences seem to reveal a sensitivity for the young audience and a genuine conviction to gain deeper insights into their world. For instance, to help children **get familiar with actors** (strangers), one company let children see an actor's process, i.e. putting on a costume and setting up the props and stage, while other actors move around in the foyer with the audience and then led them into the performance space (Fallon and Loo, Van, 2009). Like Oily Cart, many of the projects

test their shows with audiences in rehearsal and consult a wide variety of childhood specialists, such as nursery practitioners, academics, psychologists, a brain researcher, midwives and music therapists (Novak 2009; Flower, 2009; Hojer, 2009). Oily Cart (UK), Starcatchers (Scotland) and Theatre de la Guimbarde (Belgian) state they adopt a child-centred approach. They have realised the value of participation during the making of the performance and visits nurseries throughout the development of production (Young and Powers, 2008; Fallon and Loo, Van, 2009; Brown, 2012). The companies can observe reactions, test their products and get feedback from the children and finally to show them the results that they have influenced. Actors have also found this process is essential not only for **getting used to working with children** but to understand them better (Fallon and Loo, Van, 2009)) Some companies **greet the audience**, and the performance **starts slowly** or keeps spaces brightly lit (Pinkert, 2009) . Many of the performances staged in an end-on mode (audience is sitting in front of the stage) have a **permeable stage border** between the audience and performers; children are allowed to wander in and out, to stand or sit to watch or be seated on the floor/cushions (Fowler, 2009; Young 2004; Frabetti, 2009). In **multisensory experiences** audiences can touch and interact with objects (Fowler, 2009; Young, 2004) **Small audience sizes** are favoured (Fowler, 2009; Young, 2008) and parents are encouraged to interact with children (Brown, 2012; Young, 2008).

The above list is by no means exhaustive but serves to illustrate the similar approaches and how some practices value extensive research. The creative investment and the effort that some companies have undertaken to make productions suitable for a TEY audience is essential. There is an increasing number of productions that are exploring alternative formats and privileging interactive experiences over the more traditional and widening the possibilities of what TEY theatre can be (Young, 2008; Fowler, 2009; Hovik, 2018). However, the cultural, socio-economic and political policies in each country play an essential role and practitioners will need to negotiate these locally in order to create a fertile environment for very young children to engage in TEY actively. A supportive environment is required for any emergent field and network to be successful, and it is fundamental for the further development of TEY.

2.2.1 Networks

Only when the local TEY companies were combined with international networks and produced international festivals exchange programmes, did TEY begin to develop and transform into a strong community of practice. Networks helped to create and disseminate resources, reports, academic and creative practices. The **International Theatre for Young Audiences Research Network** (ITYARN), founded in 2006, has done much to increase the scholarly output and publications in the field. Nevertheless, despite the growing output of performances worldwide, there is still a lack of academic research in theatre for children as an art form (Juncker, 2012).

Festivals and networks have become the mainstay of the TEY community, and as the economic situation changes, many countries have become vulnerable to cuts in cultural activities (Belloli, 2011). The EU Programme of Culture 2000 funded networks has become one of the primary resources for countries to expand their local networks. One of the first networks was **The Glitterbird project** (2003–2006), funded by the EU Programme of Culture 2000 which involved theatres from six different European countries managed by Olsen, a child and childhood specialist from Oslo University College in Norway (Böhnisch, 2006). The findings and performances influenced local and international practitioners including the Scottish company, Starcatchers. As a result, they started a research project to help develop a Scottish network of artists and created a repertoire of work (Young and Powers 2008). The tipping point for the expansion of TEY was the first international festival of Theatre for the Very Young, hosted by La Baracca **‘Vision di theatre, Vision di future’** in 2004. By 2009, it included delegates from 31 countries and extended the work to other art forms, visual and multimedia. Twenty delegates from the UK attended, and a local network developed headed by Polka Theatre, London (Dower, 2004; Belloli, 2011). The Small Size Network, led by La Baracca in 2005, focused on children from birth to six and aimed to widen opportunities for research and collaboration. It has grown from a network of four to 18 European countries and two international partners. With successive funding from the European Commission and Culture since 2005, it supports a growing number of artists and performances touring on the

international children's festival circuit (Frabetti, 2009; Van de Water, 2012). The committed community has further developed the art form and increased awareness for the rights of children as cultural citizens. The current project *Mapping* (2018–2022) questions more fundamental aspects of the art form, such as what are the aesthetics of performance for very young children?

2.2.2 TEY UK Network

In 2006 Polka Theatre joined the Small Size Network and had been the flagship TEY company in the UK, supporting and developing new artists and work in this area. There are a host of annual and regional children's theatre festivals such as *Take Off* (Durham), *Imagine* (Scotland), *Spark* (Leicester), *Wheee! Festival* (Nottingham) and *Boing* (Kent) that programme a variety of local and international productions which have gone some way to encouraging local theatre practitioners in the appreciation of the value of TEY. In a national theatre conference report (2007) European performances were described as often having 'high aesthetic quality and a combination of abstraction with the narrative' (Ball *et al.*, 2007, p. 3). Currently the festivals promote many family events but there are still only one or two performances that are made specifically for under-threes and still very few interactive performances.

2.2.3 TEY and Research

There are some challenges that TEY faces, such as research and critical enquiries into approaches in professional practice, the demands of the economy, crossing the boundaries of traditional theatre and attitudes to children and what it means to make a child-centred performance. Overall, theatre for young audiences (TYA) is under-researched, academia has not taken it seriously, and TEY is no different; but research is slowly emerging (van de Water, 2012).

'It may be time for theatre theory to recognise and study the emergence of theatre for babies – whether theatrical installation or performance – new practices required for its production' (Goldfinger, 2011, p. 295).

More recently, Koch's (2017) research reviewing the TEY situation in Europe highlighted that it is currently very popular with festival producers. However, there

are still challenges in national funding and argues that research is required to legitimise the claims are being made in the TEY today (Koch, 2017) Most artists work flexibly and do not always have the infrastructure to collaborate with external partners. Even established companies find the current economic situation difficult. For instance, 'La Baracca in Bologna, can, in their own words, only finance their productions for the very young with the help of funds from the "Small Size" network or through collaborations with institutions' (Koch, 2017, p. 33). Out of 227 TYA companies in England, only 42 were part of the regularly funded organisations, supported throughout three years in 2009 (Koch, 2017, p. 33).

Significantly, TEY has given rise to experimental work, influenced by installation and performance art, leading some practitioners and researchers to frame TEY outside of theatre and within more modern practices in visual arts (Pinkert, 2009; Taube, 2009; Davet, 2013). Pinkert argues that TEY faces the same challenges as contemporary avant-garde theatre and identifies characteristic for creating theatre *a new aesthetical experience*.

'There is no separation between common spaces and artistic spaces, the world of the absorbed play and the culture every day... theme of different realities convolute with each other... There are alternative possibilities for the structure of authority... share performance and auto poetic feedback loop (Fischer-Lichte 2004: 61f)... Attentiveness and techniques of focusing and organising attention within hierarchies are broken apart and can lead to other perception and forms of attentiveness. It is a matter of artistic Praxis to experiment with new forms' (Pinkert, 2009, pp. 62–63).

In order to move forward and experiment with the new forms described in the quote from Pinkert above some theatre artists and companies visit nurseries and test their work with children; observing children is paramount (van de Water, 2012). It demonstrates how those TEY practitioners are taking children seriously and valuing their voice. Others get advice about children's developmental milestones from educators then rely on their direct audience observation (Fletcher-Watson *et al.*, 2014). Many of these methods are not practical for smaller theatres companies and artists, so they tend to use developmental milestones as a guideline. However, this

approach portrays a limited view of children abilities, and some early childhood researchers are sceptical about relying on them only (Fawcett, 2009). However, TEY companies are in a difficult situation, they usually hire artists for a short period of four to five weeks to develop production, and they do not have their theatre or rehearsal space. The situation is unstable; in England, there are about 170 children's theatre ensembles (0–16), but only five have permanent venues (Koch, 2017, p. 61). Nevertheless, a few TEY researchers have begun to think about how they can support artists. Since 2016, two TEY models were published, one in Scotland and Norway based on practice. 'The dramaturgy of TEY' outlined in Fletcher-Watson's PhD thesis (2016) was developed using grounded theory and data from 26 Scottish TEY artists. It outlines six significant areas categorised into two core areas – treating children as equals and retaining artist integrity. 1) Sharing experience – actor-spectator relationships, including the possibility of greeting audiences; 2) Providing what works with testing – trialling, participation, inclusiveness and surprise; 3) Gift giving – the perception of gift-giving – welcoming not treating, providing facilities, buggy parking; 4) Treating children as we treat adults – respecting children; 5) Abandoning tradition – extend beyond narrative theatre traditions; 6) Emphasising the struggle – artists' ways of working connected to the integrity of work (Fletcher-Watson, 2016, pp. 174–8). This model covers the ways of working with children and performance, while the next model, the 'SceSam working Model' by Nagel and Hovik (2016), is for interactive dramaturgies in performing arts for children and has been tested in several public performances in Norway with children between zero and 12 years old. The model consists of six different categories with different levels of participation from close to open performances and the relationship of the performer and children within the categories. 1) Closed dramatic forms – quiet absorbed observation; 2) Closed narrative form – participation through verbal input; 3) Closed activating participation – participation through mirroring or conducted action; 4) Open installation or moving participation – physical or scenographic interaction; 5) Open inviting dialogue form – dialogical interaction; 6) Open improvising form – creative collaboration through participation (Nagel and Hovik, 2016, p. 159).

Like this research project, both models are based on children's rights perspectives (Articles 31 and 12) and emphasise participation and respect for children's rights. Some areas in these models overlap with this research, such as Nagel and Hovik's interactive dramaturgy and some of the areas in the Fletcher-Watson model such as a greeting.

Currently, there are no research projects that investigate the role of technologies to make TEY performances more interactive. The theatre industry is responding to the demands of the information age and the rapid changes in our cultural and artistic relationship with technology. The *Culture is Digital* report demonstrates experimentation and innovation using digital technologies in the arts today is the focus and the current cultural discourse around the creative industry in the UK (Department for Digital, Culture, 2018). Perhaps it is a matter of innovating and keeping 'ahead of the game'. So, what technologies may be useful in the context of TEY and what we know of children is the subject of the next section. I will present and discuss the shifts taking place in making digital culture and the role that HCI practice, and in particular tangible interaction design and interactive art, can play in furthering the development of TEY.

2.3 HCI – Children & Tangible Interaction

Babies and young children engage in play and use all their senses – touch, sight, smell, hearing – to investigate, explore and understand the objects in the world around them (Macintyre, 2011). The introduction of touchscreen devices meant mainstream technologies and computer applications are more accessible to younger children to use independently (Chaudron, 2015). Previous pointing devices like mouse and keyboard proved to be challenging for children under three (Hourcade *et al.*, 2015). This recent exposure of very young children to mainstream technologies means there are only a few studies about how children under three years engage with technology and, moreover, what is appropriate for them (Hourcade *et al.*, 2015). However, there is a long history of research into smart toys and how children interact with them that can be beneficial for the design of interactive scenography.

2.3.1 IDC & Toys

The first commercial smart toys appeared on the market 1993 for engaging children in interactive learning that was fun (Goldstein, 2012). This trend has continued to grow and recently has become more prevalent as some toy manufacturers have found that parents of very young children are more cautious of the mainstream media messages about the negative impact of screens (Corby, 2016). Recent studies have found that some on-screen applications can cause cognitive overload in very young children. They can experience ‘transfer deficit’ as a result; it was found that they can learn concepts easier with real-world objects than on screen (Barr, 2010). Using toys and tangible technologies have become a way to bridge the gap between physical and digital worlds. For younger children, there are ‘speaking toys’ which aim to teach literacy skills, interactive, standalone plush robotic toys and others that augments screen-based interaction (Goldstein, 2012, pp. 24–25).

Studies have found that smart toys could keep children on a task for longer and benefit ‘open-ended play’. Fun, rather than technology, was the most essential feature for making a toy attractive to children (Goldstein, 2012). Ackermann (2005) argues that the endowment of lifelike qualities through affordances of movement and sound is not adequate. Toys need to capture our imagination, enchant and have holding power. She recommends that the user’s psychological points of view should be considered by the designers: 1) **Conviviality** – where there is a conversation between the child and the smart toy; 2) **Artificiality** – the toy/object is not alive, they can play out scenarios; 3) **Believability** – believable actions that foster playful exploration (Ackermann, 2005, p. 7). When designing interaction for ‘cyber-creature’ toys/props, the question is ‘what does it achieve (on its own), and how should it be treated (manipulated or controlled) so that it responds (to one’s solicitations) in interesting ways’ (Ackermann, 2005, p. 7). These recommendations are applicable for both interactive props and scenography, and more significantly, they focus on the designer exploring the child’s interaction. Horn *et al.* found that a tangible interface can aid children’s learning and exploration in older children. The tangible interface allowed for more exploratory behaviours and social interaction which is an advantage when designing interaction in a theatre setting (Horn, Crouser and Bers, 2012). Roger *et al.*’s

framework for mixed reality environments focus on play and learning with children between the ages of five and six years. They found putting together the ‘unexpected’ with the ‘highly familiar’ created ‘richer’ experiences, interest and reflection (Rogers *et al.*, 2002). Early years theatre companies like Oily Cart also found that relating the play theme to real-life events themes and stories connected to children’s everyday life can help them engage with the performance.

2.3.2 Interactive Art in HCI

There has been a gradual integration of Interactive Arts in HCI, with the first exhibition of interactive art seen at the CHI 2016 (Computer-Human Interaction) conference. Edmonds argues that the discourse in the community is changing. By comparing words from two CHI conferences proceedings, he found in 1981 the word ‘creative’ turns up just once as compared to 141 times in 2011, in contrast to the word ‘productive’ which occurred 95 times in 1981 in contrast to 41 in 2011. This shift in CHI conferences to the ‘creative’ he attributes to the current concerns for ‘human creativity, emotions, experience and feeling’ (Edmonds, 2018, p. 12). Interactive Artists and HCI researchers are not mutually exclusive, the disciplines can work with each other through their knowledge and methods. Many laboratories based in science departments such as the Mixed Reality Lab, Nottingham have been collaborating with artists for decades.

There still seems to be a divide between creatives and technologists. However, when making interactive art, the artist goes beyond considerations of how the work will look or sound. The way that an artwork interacts, influences and engages the audience is crucial and can make a valuable contribution to the HCI discourse (Edmonds, 2018). The core of an interactive artwork is that it possesses behaviours (Krueger, 2002; Penny, 2017; Edmonds, 2018). Penny argues that the design and aesthetics of interaction have not advanced as much as the technology because the artist and technologist have not given enough consideration to embodied interaction (Penny, 2017). ‘To recognise that interaction is both embodied and performative provides us with the means to build aesthetically. Interaction is inherently extended in both time and space’ (Penny, 2017, p. 356). When an artwork becomes interactive, then the traditional rules of aesthetic are not applicable as it does not consider agency,

relationality, performativity or behaviours that are inherent in an interactive work (Penny, 2017). In Ascott's Cybernetic Art the notion of the 'feedback loops' (adapted from computing) is that there is a two-way exchange, a creative evolution between the artwork and the spectator (Ascott, 2002). Central to these arguments is that an interactive artwork is an 'open work' where active participants play a pivotal role in the interpretation and the performance and can be compared to ideas in experience design today (Gaver and McCarthy, 2016). McCarthy and Wright, influenced by Eco's essay on *Poetics of open work* (1962), suggest there are three levels of openness – the first level of engagement allows for multiple interpretations which are true to most cultural works; in the second, resources are made available that change the artwork, generating a conversation between the author and the audience through 'composing, assembling and controlling'; and finally in the third the author develops a 'platform' or framework where the audience can 'create, compose and perform' their work (McCarthy and Wright, 2015, p. 25). For the practice-based research element in this research, I am interested in exploring interactive ideas around the second level of openness.

Eco's essay on *Poetics of Open Works* (Eco, 1989) explores improvisation music and participatory theatre. It could be a way of thinking about ways of seeing and creating spaces for playful interaction and narrative, where the children are at the centre. An open work allows for no centre or fixed privilege points of view; it is in flux, it provides a variety of ways to understand and interpret and is open to interventions (Eco, 1989, p. 20). It deconstructs elements within the traditional theatre structure, not moving from 'one concept to another but in reversing and displacing a conceptual order as well as the nonconceptual order with which it is articulated' (Derrida, 1988, p. 21). In the context of the scenographic space, it moves from privileging the visual (conceptual order) to displacing it, by adding haptic and multisensory interactivity. It facilitates different means and concepts that the audience can experience. The role of the audience and the scenography is also displaced as they gain more agencies and become performative. In this sense, it is still theatre, not installation art and the traditional theatre space is now deconstructed. However, Eco points out that even though a 'the work is incomplete,' waiting for the performer/audience to complete it,

the work is considered within a framework which allows mutability within a set context, and the author fixes its limits. Interaction with objects can affect an audience's thoughts and actions and go some way in connecting the traditional divide between 'aesthetic pleasure and practical action' (Berleant, 1991, loc 998–1000). Open scenographic space is 'in movement' (not fixed) generates a relationship between contemplation and utilisation (Eco 1989, p. 20). The scenography for the performances designed and studied in this thesis is open in this context. In the next section I go on to look at the digital open hardware and software tools that can make this interaction possible.

2.3.3 Digital Makers

The cultural shift from the consumer to the creative content makers was fuelled by the readily available digital open hardware and software tools across two decades (Anderson, 2012; Cheung, 2014, p. 112). Although arguably there have always been inventors and makers, the cultural shift was not about how it was done but by whom (Anderson 2012; McCarthy and Wright 2015). The Maker Movement began with a desire to move away from screen-based digital technologies, and an essential part of the movement is digital do-it-yourself (DIY). Products were already being designed digitally and manufactured in commercial factories. However, the rise of 'open hardware tools,' *i.e.* Arduino, made desktop manufacturing became a reality for many more people – artists, hobbyists and educators; the process got simpler. Today in the developed world, there are thousands of Maker/Hackspaces in cities. In the UK, many local libraries have installed 3D printers, sewing machines and other maker tools in the last few years. There appears to be a social shift in the development of local creative communities. Without open hardware and software technology, DIY could not occur, and at its 'core, it remains a sociocultural, economic, and psychological phenomenon' (Anderson, 2012, p. 21). Anderson (2012) found that the three 'transformative' characteristics that the Maker Movement shares are: 1) Digital Desktop tool for manufacturing; 2) change in cultural norms –sharing on the online community; and 3) Common file types that allow for small- and large-scale professional and amateur making (Anderson, 2012, p. 21).

2.3.3.1 Hybrid crafting

The emergence of open-source hardware, crowdsourcing and digital DIY or DiDIY have made technology both affordable and accessible, and more designers and artists can explore these technologies for computational objects. Wiberg and Robles argue that there is a ‘material turn’ taking place within interaction design and it manifests through tangibility (Wiberg and Robles, 2010). Researchers have explored a variety of materials to combine the digital and physical such as Perner-Wilson wearables and the constructing of soft sensors ‘kit-of-no parts’ demonstrates a new form of textile arts and crafting (Perner-Wilson, 2011). Coelho (2007) explored material intelligence through craft (casting, milling or weaving) that can have ‘collocated inputs/outputs’ and where behaviours relate to computational processes, such as feedback, loops or ‘undo’ (Coelho, 2007). Treadway (2007) found that even although digital tools are beneficial to artists, they must develop a deeper understanding of the impact of digital tools on their creative cognition and craft process (Treadaway, 2007). It needs to be considered if TEY practitioners adopt digital tools in their practice. Designing interactives for TEY is a creative challenge but can potentially allow young children to experience hybrid performances, a live interactive theatre that responds to their current cultural lives. Designing and crafting flexible circuits that use wearables and computational objects for the very young requires objects that are flexible, washable, lightweight and sensory that can be grasped by tiny hands. The proliferation of digital and sensing technologies can have profound effects on theatre in the future. We will now turn to look at the impact of technologies on the stage and scenography in particular.

2.4 Scenography & Performance

In the last two decades, digital technologies have shaped many aspects of performance and pre-recorded, and live projection on stage is now a common feature of stage aesthetics. The parameters of theatre and the perception of what constitutes a performance are shifting (Causey, 2006). Emerging technologies are driving innovation (Bay-Cheng, 2010), for instance, the National Theatre, London opened an immersive Storytelling Studio to develop new writing and productions specifically for 360°, VR and immersive environments. These new technologies have a direct effect on

the role of the scenographer; the set design is augmented with digital technologies. The juxtaposition of the mediated and live image impacts on the aesthetic of a production. Blake argues that 'mix media not only challenges the conventions of theatre; (but) open up real alternatives at the level of conceptual and habit' (Blake, 2014, p. 35). How theatre and scenography responded to 'real alternative' is discussed in the next sections. My aim is not to offer a complete history of technology in theatre and scenography but to highlight artists, events and theories that are significant for understanding the current situation and potential for developing interactive scenography.

2.4.1 Technology on Stage

The science of cybernetics (1948) is 'the control and communication in the animal and machine,' (Wiener, 1965). It is a system that uses information about its output to control itself in a feedback loop. The relationship of 'the man and the machine' was at the forefront of the 'Scene Dynamic Stage' of the futurist theatre in 1917. The aim was to transform scenographic stages through electrics and materials. Their manifesto revealed that it was not only about the scenography but the removal of the fourth wall. The futurists Prampolini and Depero (Italy) envisaged an entire mechanical stage with mobile architecture, dynamic interactive scenography, where the audience becomes the actors and film is projected on the stage (Salter, 2010a). Their work parallels a common theme in the twentieth century – 'the construction of stage machinery where human elements were integrated into, made equal with, and ultimately subordinate to technical apparatus' (Salter, 2010a, p. 11). Kirby compares the elements of futurist performance as 'Compression, dynamism, simultaneity and the involvement of the audience' (quote Kirby, 1971 in Dixon, 2004) as a fundamental concept within a digital performance (Dixon, 2004). Although many of the futurist visions went unrealised, Dixon argues that the futurist aesthetics and philosophies were underestimated in the history of digital performances (Dixon, 2004), even though the technology of the time had some influence on theatre and scenography before 1917. The futurists had a gestalt response to the mechanisation of their world, perhaps harking back to Wagner (1849), the ideas of Gesamtkunstwerk or total theatre the synthesis of arts (Packer and Jordan, 2002). The Futurists tried to create

a synthesis of art forms with the consideration of relationships of theatre to actors, stage to the audience and the scenography, set and lights as a 'scenic personality' with a life. Causey remarked that their vision 'sounds like a contemporary smart environment of sensor-based computer actions of immersive projections and audioscapes' (Causey, 2006, p. 86).

2.4.2 Projection Design

Projected images and film have continued to be used as dramaturgical mediums by artists worldwide, such as Meyerhold in 1920s Russia, Piscator in 1920s Germany, Jones in 1940s in the US and Svoboda in 1950s in the Czechoslovak Republic. In theatre, Svoboda was one of the most prolific scenographers that experimented with projection design in the 1960s; he believed in the dramaturgical possibilities of the medium. Some artists used projection to create the illusion of three-dimensional dynamic stage scenery. For instance, Robert Wilson's (1998) *Monsters of Grace* is an opera that uses stereoscopic projections with a live orchestra. Reaney argues that 3D real-time virtual reality scenography can retain the live quality of theatre (Esfandiary and Reaney, 2014). Bill Dudley designs for West-End productions; *The Women in White* (2004) used a cyclorama with projected computer-generated scenery that emulated cinematic techniques. It divided opinions about the live vs the digital; some felt it evoked the 'illusionary painted backdrops' (Tabački, 2017, p. 134). However, Aronson observed a surprising phenomenon – a 'lack of audience response' to the scenography and surmised that the digital imagery is so commonplace, that audience may not have perceived it as novel or exciting. He argues we can go beyond the frequent use of projection as a substitute for scenery or as a 'complementary image system'. He suggests by understanding the 'aesthetic and cognitive vocabularies of such technology it could be better translated to the stage in such a way as to be accessible and meaningful to the contemporary audience' (Aronson, 2010, p. 87).

2.4.3 The Interactive Stage

In the pursuit of liveness, the Cirque du Soleil show *Ká* (2004) used projection design with robotics for moving scenery and a sensor-driven floor that reacted to projected images and tracked performers movements with infrared camera technologies. *Ká* is a high budget large-scale commercial production. However, the Italian children's

dance company, Compagnia TPO employed a similar approach to *Ká*, albeit on a smaller scale. They developed an interactive floor called the ‘children’s cheering carpet’ (Venturinii, 2009), a dance floor with touch sensors embedded on its underside; as a result, a person’s bare feet or body movement (motion tracking) activates sounds and projected animations onto the floor mat or on an upright screen. The technologies are not visible to the audience, and during a performance at regular intervals, groups of eager young audiences are ushered from their seats unto the stage. They are encouraged to follow the dancers lead and as they run, jump or walk on the stage and as if by ‘magic’ the projections follow their movements. However, the interaction is only for a few minutes, and in some cases, not all the children get a turn on stage.

Nevertheless, the real-time interaction made possible through the use of sensors facilitates a more active embodied experience and engagement with the mediated stage. The technologies used by Compagnia TPO and Cirque du Soleil are a rare occurrence in theatre. The performances discussed in this section all appear to have a common goal, to create three-dimensional dynamic scenography in an attempt to make the mediated image feel more ‘live’.

The developments in performances and technology in the late 1950s and 1960s revealed a shift to a more participatory arts culture. Artists and theatre makers sought to extend the role of the audience by questioning the fixed frame of the traditional stage in a similar way to the futurists. By the mid-1950s, artists wanted to escape from theatre and gallery buildings and to make art and theatre more interactive. ‘Happening’ was theatrical events with no rules; each event used their own ‘intermedium,’ a mix of collage, music, technology and theatre (Higgins and Higgins, 2001). It was the forerunner to Performance Art today. It influenced several theatre directors such as Peter Brook whose book, *Empty Space* and Richard Schechner’s essay *6 Axioms for Environment theatre* were both published in 1968. Their philosophies were about bringing theatre outside of the building, making it more participatory, experimental and site-specific and their ideas are still relevant and evident in the current popularity of immersive theatre in the UK.

This shift to the performative, the feedback and interaction from audiences reflects the growth of hybrid digital spaces. Gruppo T, Italy (1964) made one of the first art installations to use sensor-based environments. Spectators could trigger and activate elements such as lights, sounds and mirrors to creating a dynamic relationship with space and altering their perception (Salter, 2010a). Myron Krueger, an artist and computer scientist, ‘marked the beginning of a major and epistemological shift in interactive environments’ (Salter, 2010a, p. 316). Influenced by John Cage’s (1960s) experiments on indeterminacy, he used live electronics on stage, manipulating and creating electronically-generated feedback processes in a live orchestral context (Salter, 2010a). For Krueger (1969), the live interaction was central to the development of his sensing systems (responsive spaces) for installation art; he was not interested in the environment as an interface. He used pressure pads on a sensing floor, ultrasonics and video digitisation to detect bodies in space. His concept of tracking and sensing floor is remarkably similar to the system used by Compagnia TPO and Cirque du Soleil, almost 50 years later. Krueger found after making several interactive artworks that the immediate experience is more engaging than the accuracy of the graphics. The awareness of the body is essential in the experience. He argues that as computers become ubiquitous, the design of intimate technologies is an ‘aesthetic issue as much as an engineering one’ (Krueger, 2002, p. 107). He approached technology as a material rather than a tool. In the same way, an artist works with physical material, and it is aesthetic in the work which affects the viewer. For Krueger the aesthetic interaction was his material/artform, it was what he wanted to affect his audience, not the output, i.e. sound, video or light.

2.4.4 Cybernetic Stage

In parallel, exhibitions like *Cybernetic Serendipity* (1968) at the Institute of Contemporary Art (ICA), London aim to ‘demonstrate connections between creativity and technology and link scientific and mathematical approaches to irrational oblique urges associated with making music, art and poetry’ (Reichardt, 1968, p. 10). The interactive works were not always finished but were exploratory, and the notion of chance was embodied by many them (Edmonds, 1994). Around the same time, similar events and exhibitions occurred in many western counties – for instance, *9 Evenings:*

Theatre and Engineering, New York (1966) was a series of dance, music, theatre and installation performances. This melting pot of ideas connected theatre artists to cybernetics scientists, both concerned with interaction, authenticity, participation and the live experience. These concerns are the same for this research and many interactive works today. One of the most formidable collaborations in the mid-1960s was a proposal for the development of London Fun Palace, a type of cybernetic theatre (1964–1975). It was the brainchild of the British theatre director Joan Littlewood and architect Cedric Price. Their concept was to create a performative space that was ever-changing, interactive and participatory. Littlewood's vision was a place for new experiences that had the potential for lifelong learning and discovery (Hobart and Colleges, 2005, p. 77). They enlisted Gordon Pask, (1965), a cybernetician, who exhibited at *Cybernetic Serendipity* (1968) and a pioneer in modelling cognition. He proposed learning occurs through conversations about a subject matter, thereby making knowledge explicit. Haque (2007) argues that it is vital to reconsider the Paskian approach as it provides guidance on how to build such systems, with strict definitions for 'performance', 'conversation', 'interaction', 'environment' and 'participation' (Haque, 2007, p. 60). These definitions read like ontology for theatre. It seems clear why Littlewood had an affinity for developing a Cybernetic Theatre. Like the futurists in 1917, their ten-year pursuit for the 'Fun Palace' never came to fruition; however, these projects point to openness in artistic culture to embrace other disciplines. The expression of creativity in arts and science and core ideas of interactivity, participation and responsive environments working in co-operation are the philosophies that are required of theatre artists today if we are to integrate interactive technologies into the theatre. 'Theatre provides a rich territory in which to explore epistemological and cybernetic ideas' (Sweeting, 2014, p. 620).

The growing ubiquity of technologies has facilitated digital environments and made experimentation in hybrid environments more accessible. Since the 1990s, there has been a wave of innovation and experimentation in digital technologies – performative installation spaces, using audio, video projections, sensors, telematics for live performance events (Dixon, 2007). Most notable are seminal performative works, *The Legible City* (Shaw, Jeffery 1989), *The Famous Grouse Experiment* (ART+COM 2000),

Desert Rain (Blast Theory 2000) and *TGarden* (Sponge/FoAM 2001). Technology has finally caught up with the ideas of the futurists and cyberneticists, and we can do well to understand those core ideas were not so different with hopes for the future role of technology.

2.5 Conclusion

In this review I have tried to join the dots by looking back and thus was able to look ahead in my quest to find a way through/into this multidisciplinary PhD research. Technology, as an artist material, will feature in my studio practice. The review highlights the fluid boundaries that artists, theatre, technologies and scientists operated in during the twentieth century, which we have somewhat lost in the consciousness of our current world. Nevertheless, from my point of view, the participatory practices in TEY are synonymous with interactivity art and HCI/IDC – they want to shift an audience experience to one that is more involved. However, both terminologies are problematic and overused in our digital culture. There is not one perspective or understanding, and each time they are defined differently. Many children's activities are advertised as interactive or participatory are often engendered with specific modes, spectator conventions and levels of interactivity and participation. Whether it is theatre for early years, interactive arts, early years practice or HCI; interaction and participation is the common goal that links the areas. A child has the right to participate and have freedom of expression (Article 12 of the Convention on the Rights of the Child). The question for research into interactive performance for children that arises is not only of participation but of 'genuine participation' that ensures respect for children and their capabilities. It is the subject of the next chapter that explores what methodologies can help to find answers to the research questions.

Chapter 3 RESEARCH METHODS

This chapter describes the multiple methods approach that combines art and design and qualitative research methodologies adopted as the overarching research strategy. The aim of this interdisciplinary research is to create an integration where the results from one method help to develop the work of the other, a shift away from the singular subject to the notion of closer integrated knowledge and exchange. This interdisciplinary research aims to take a child rights perspective. Child rights are outlined in the Convention on the Rights of the Child (CRC), adopted by the United Nations, (1989). Child rights affect research about children – the concept emphasises the importance of accurate, unbiased research that respects the child’s voice and researchers need to consider their relationship with the children in their study. The research aims to understand how the knowledge gained from different methods can create a broader scope and offer more significant opportunities for developing more interactive Theatre for Early Years. This approach benefited the research in achieving its objectives and answering the research questions raised by focusing on multiple sources of evidence from undertaking studio practice, naturalistic audience observation, interviews and parent surveys.

Two performances/installations – *Into the Woods* and *The Runaway Hare* – were designed, made and evaluated. A Play Pattern Design Framework was created by adapting an existing Early Years Schema tool which was used as part of the scenographic design process.

The nature of the research and the issues investigated is not without its predicaments. Designing a research strategy that respects the youngest and genuinely listening to their views needed careful consideration in conjunction with designing interactive scenography and objects that give them the opportunity for an audience to express their agency through meaningful play. The chapter is organised into four sections: firstly, Art and Design Methodologies, secondly Play Patterns Design Framework, thirdly Research with Children, and fourthly Performance Studies.

3.1 Art and Design Research Methodology

Practice-based or research through art and design practice which produces creative outputs is an integrated approach of studio research. The debate surrounding the appropriate methodologies and academic frameworks for art and design practice, including scenography research practice is ongoing. In the last decade, there has been a significant uptake of Art & Design PhDs, creative fellowships funded by the Arts Humanities Research Council (AHRC, 2018) and Artists and Designers joining HCI communities (Edmonds, 2018). As a result, there is more academic research and debates about research methodologies, and some fundamental strategies and initiatives have emerged. Practice-led research in Art, Design and Architecture (ADA) supported academics and the AHRC *Training Grant Funding Guide* for 2015/2018 states:

‘For research to be considered as practice-led, the student’s own practice must be an integral part of the proposed project, and the creative and performative aspects of the research should be made explicit. The research carried out should bring about enhancements in knowledge and understanding in the discipline, or related disciplinary areas.’ (AHRC, 2018, p. 6)

The studio practice research covers all the main points in the above statement. However, in practice, the challenges lie in what is an acceptable contribution and ‘the nature of knowledge produced’ (Wilson, 2008, p. 2). Central to the debate is the ‘delicate balance that must be struck between the explicit and tacit aspects of the research’ (Rust, Mottram and Till, 2007, p. 63) and the difficulties in evidencing work/artefacts with non-linguistic outputs (Wilson, 2008). Also, validity and ambiguity of artistic practice methods are not always transparent or rigorous (Hannula, Suoranta and Valden, 2014). Malins and Gray (1995) position the artist-researcher/practitioner ‘central to the inquiry as for the context in which the research is taking place’ (Malins and Gray, 1995, p. 2). Hannula, Suoranta and Valden’s interpretation of the studio-based research practice was to approach the research

from within and be a participant in the practice, the researcher ‘acts inside the practice’ (Hannula, Suoranta and Valden, 2014, p. 15). They emphasise that this subjective approach also needs the balance of the ‘outsider’ researcher who questions and reflects on the practice, methods, materials as well as that the work created from that practice should be viewed critically by the practitioner and researcher (Hannula, Suoranta and Valden, 2014, p. 15).

Artistic Process: acts inside the practice	Arguing for a Point of View (context, tradition and their interpretation)
Committed with an eye on the traditions of the practice	Social and theoretical imagination
Documenting the act	Hermeneutics
Moving between insider and outsider position	Conceptual linguistic and argumentative innovation
Preparing works of Art	Verbalisation

Table 3-1 ‘Basic formula for Artistic Research’ from Hannula, Suoranta and Valden (2014, p. 15).

As seen in Table 3-1, theory and practice are not separated as both can work in conjunction with each other, and the artistic practice research method can be grounded in a philosophical stance. It resonates with Donald Schon’s model of ‘reflective in action’ and ‘reflective on action’ widely adopted in art and design practice and research.

Exploration of being both the ‘insider and outsider’ is exemplified in the studio practice in Chapters 4 and 6 and study in Chapters 5 and 7, which report and critique the designs. The artistic studio practice aims to be experimental, flexible, adaptable, open to happenstance and use an iterative approach to produce ‘new’ forms of knowledge that can only come from employing the artistic/design process described by Archer.

‘There are circumstances where the best or only way to shed light on a proposition, a principle, a material, a process or a function is to attempt to construct something or to enact something, calculated to explore, embody or test it’ (Archer, 1995 in Edmonds 2018, p. 18)

What works for one project may not work for another. The artistic research ‘formula’ proposed by Hannula *et al.* (2014) has a good deal of scope to allow for multidisciplinary and the intervention of other methodologies such as participatory research; together with a craft-based methodology as suggested by Malins and Gray (Table 3-2).

Craft-based Methodology
1) Initially consider a range of research strategies (from all disciplines);
2) individually ‘tailor’ the research project in response to the nature of practice, the specific research project and the researcher’s expertise as a craftsperson;
3) research from the informed perspective of the reflective practitioner, as ‘participant observer’;
4) continually define and refine the research question in an iterative process, and allow methodologies to emerge;
5) acknowledge accessibility, discipline, rigour, transparency, transferability as the characteristics which distinguish research from day-to-day practice in the visual arts;
6) be aware of the critical context of practice and research, and use the contextual review to situate the researcher and to help generate and raise the level of critical debate;
7) consider an interdisciplinary/multidisciplinary approach to research, using a ‘multimethod’ or ‘triangulated’.

Table 3-2 Crafts-based research methodology from Malins and Gray (1995, p 9).

The seven points outlined in Table 3-2 are a good starting point. It alleviates the ambiguity that sometimes surrounds artistic practice research and supports tacit knowledge and new artistic methodologies that can have the credibility and rigour that are required. It accepts, like Hannula, Suoranta and Valden, that ‘research through practice, similar to other research, should be systematic, rigorous and critical,

offering a communicable development in the knowledge that is open to scrutiny' (Wilson, 2008, p. 3). All practice including art and design is bound by the traditions of that craft (scenography) and the theoretical and conceptual framework that surrounds the artistic practice and research (Hannula, Suoranta and Valden, 2014). In the next section, I discuss the theoretical and conceptual framework for the approach to scenography.

3.1.1 The Scenographic Approach

In addition to the art and design approaches discussed above the design methods draw on contemporary practices in post-dramatic theatre and scenography. The scenographer's role is collaborative, involves working with a creative team, including a director and lighting and sound designer and includes designing the stage sets and the costumes. The work involves making a scale model, storyboarding the scenic changes, drawing the designing of the stage/prop designs and costumes. The scenographer works closely with the director before rehearsals begin and usually presents the design to the actors on the first day of rehearsals. On small and medium scale productions it is the responsibility of the scenographer to produce the technical drawings and liaise with the stage manager or producer on the logistics of stage set pieces, especially if the performance is touring to different venues. However, this traditional approach can vary, dependant on the type of theatre company. For example, in post-dramatic and visual theatre, formal roles often crossover and interchange. This research draws on a 'visual dramaturgy' approach, where the text is not exclusive as in the traditional theatre process.

The scenographic and performance exploration is of the physical and technological materials over the textual (Lehmann, 2006; Pavis, 2006, p. 205). Baugh refers to this approach as 'new scenography' that reflects the changing perceptions, where scenography creates the meaning in the narrative and go beyond the decorative. The visual elements are not marginalised but equal to the other elements in theatre (McKinney and Palmer, 2017).

Some scenographers take on the role of the director, for instance, Pamela Howard, a British scenographer, both designs and directs opera productions. She believes that

the role of scenography is often overlooked in performance and should be a more holistic part of theatre-making (Howard, 2001). Blurring the boundaries even further, Dmitry Rymov, a Russian scenographer, artist, and director has created an experimental theatre laboratory to devise a type of ‘designer’s theatre.’ It is ‘conceived by designers, directed by designers, designed by designers (naturally enough), and sometimes even acted by designers’ (Giurgea, 2009; O’Mahony, 2014). The company toured their performances internationally and was invited by the Royal Shakespeare Company to perform in the UK in 2012. Effectively, the meaning of the scenography goes beyond the decorative. Therefore, it potentially has a more direct and deliberate influence on the narrative and interactions. Taking the role of the ‘auteur’ in theatre is new and challenging, but it allows more artistic control over the direction and design, while enabling methodologies to emerge through my open-ended approach studio practice.

Art and design methodologies have limitations as it does not explicitly consider the viewer/audience. As this research takes a child-centred approach, the studio practice cannot be isolated from the audience; in particular, children’s natural behaviour. Marlin and Gray’s model facilitates the generation of ‘new’ methods (points 4, 5 and 7) that may arise, suits an open perspective. This research has been inspired by children’s play patterns or schemas which led to the development of a design framework discussed in the next section and goes some way in helping answer the first research question *how scenography can be designed using interactive digital and tangible technologies in theatre for early years?*

3.2 Play Pattern Design Framework

Schemas or children’s play patterns were adapted into a framework and used to aid the development of the scenography in the two performances. Schemas are used by some early year’s practitioners to observe children’s interactions with objects and their environment. They are based on repeated patterns observed in young children; for example, turning round and round demonstrates a preoccupation with a circular

motion, linking objects together is concerned with connecting, den-making associated with wanting to be enclosed within a space (Fawcett 2009).

The play pattern design framework was used to develop and extend the scenography in both performance installations. In the first performance *Into the Woods*, it was used formatively during my studio practice to design the scenographic objects. As it was the first time the framework was used and tested in a performance setting, a more detailed and extensive summative evaluation was undertaken to find out if the play patterns were still noticeable in the children's behaviour. In *The Runaway Hare*, the framework was used in the design process as in the previous performance, but the evaluation was focused on the design more than the children's behaviour.

The framework provides the scenographer with the opportunity to go beyond the traditional context and make a more significant effort to understand the audience – how young children naturally play, learn and imagine can help to design for play and enhance the scenographic space in response to children's natural inclinations and behaviours. This requires the scenographer to have an open attitude to using the framework as it goes beyond the normal scenographic process. Understanding how the play patterns are used by early years educators was key to developing the framework and is outlined in the next section.

3.2.1 Schema/Play Patterns – An Overview

'Schemas' were first noticed by Piaget, who defined them as cognitive structures or mental maps. He later made distinctions between the terms 'schema' and 'scheme' and believed that the former preceded the latter and is associated with mental plans that inform young children's actions (Athey, 2007). He was concerned with how they affected problem-solving and operational thinking. However, in this research, it is Chris Athey's definition of the schema as a 'pattern of behaviour and thinking in children' that is used. Athey's research into schema took place during the 1980s and was part of the Froebel Project. The two-year project included teacher and parent observations of children. The findings identified only a few schemas such as vertical, enclosure, circular, going over and under, and back and forth (Athey, 2007). Nutbrown and other practitioners added more play patterns to this list through their

observational studies (Nutbrown, 2010). The popularity of schemas grew in the UK in the 1990s, and today it is firmly embedded and adopted as an observation tool by many early years' settings.

Schemas are play/behaviour patterns associated with the way children engage with their environment and the objects (Nutbrown, 2010). They are classed as transporting, rotation, enclosure, connection, enveloping, trajectory, orientation and positioning (see Figure 3-1). For example, a trajectory schema is revealed when a child consistently draws a vertical line on paper and continues this activity by repeatedly moving toys up and down or building and knocking down blocks (Harper, 2004). Nutbrown (2010) argues when an early year's educator identifies a particular schema in a child that it is not enough to note it. However, the practitioner should provide activities that extend and challenge the child's learning experience of that particular schema. The length of time and the number of schemas that a child could be absorbed in is dependent on the individual and there is no set sequence.

Schemas can aid in evaluating children's actions in a performance. It can help theatre practitioners make sense of a young child's repeated action; speech, and play, which may sometimes seem aimless to an adult but plays a vital role in the development of a child's brain structure and his understanding of spatial organisation (Fawcett, 2009; Nutbrown, 2010). Fawcett, a researcher and early years consultant, believes that the importance of schema for brain development is undervalued. Research in neuroscience demonstrates that children's repeated spatial explorations help in their construction of mathematical concepts when they are older (Athey, 2007). It has not been proven whether all children work through all the schemas, but repeated research has demonstrated they are common patterns of behaviour that occur in all children no matter what their socioeconomic situations (Nutbrown, 2010).

Schemas are a child's natural inclination and have affordances for physical play activities from a methodological viewpoint, their application as a design framework can help make the scenography and performance more attuned to children's experiences, child-friendly and participatory.

3.2.2 Developing the Play Pattern Design Framework

Play patterns provide a way of thinking about design issues and design solutions. They are a valuable resource to scenographers; they are easy to understand for first time-users as there is no learning curve. An early years practitioner that uses schemas as an observational tool first identifies the particular schema and secondly decides how best to challenge and extend the schema through providing materials and creating situations for the child's play activity. This allows for more child-centred play activities, where the educator can offer the child new experiences that suit her underpinning instinctual interest. Nutbrown's example below demonstrates how an adult/educator might extend a child's interest.

'Knowing that a child is interested in "enclosing" (putting things inside things) might lead an adult to offer objects and experiences that fit with this interest, such as: playing in tents, sorting a set of Russian Dolls, making food that has something inside (such as pies, sandwiches), hiding in large boxes or other enclosures' (Nutbrown, 2010, p. 119).

TRAJECTORY up and down and along and back, drawing vertical lines, throwing, jumping up & down	ROTATION things that rotate, turning round and round, rotating objects, spinning	CONNECTING linking things together in various ways and forms, 'cutting', 'sticking', 'joining'	TRANSFORMING explore and see change, explore malleable materials
ENCLOSURE boundaries, space, shape, size, measure and capacity and possibly, imaginative play.	CONTAINING covering , putting objects in containers, 'disappeared', peek-a-boo, hide seek,, burying or digging objects	TRANSPORTING moving things about in different ways, from place to place, 'forwards', 'backwards', 'under', 'near' and 'far'.	POSTIONING positioning items in lines, rows or by size, different types of lines, size, grouping, pattern, sequencing and counting

Figure 3-1 Eight play patterns/schemas

Play patterns offer the scenographer insights into children's behaviour and can be used in the design of activities and objects for children, as well as used when observing children's actions. The design framework can be utilised in at the very start of the

design process as well as during the process by adapting an existing object. The scenographer considers which play patterns can help to enhance the interactive nature of the object and establish where it fits into the other criteria, *i.e.* script, story, environment, multisensory. In the case of multiple objects, the scenographer can work out if all the objects will have to be adjusted or just a few through sketches before building or while making the prototypes. Understanding when to apply a play pattern during the design process, how to use it, as well as how and why it should or should not be combined with other related patterns are fundamental notions in the application of play patterns. Here is where the tacit knowledge and the aesthetic considerations of the scenographer/designer come into play.

Play patterns were employed either to initiate new designs or to adopt an existing concept and used during the design process both in the ideation and the prototyping phases. Both methods can facilitate active change and adaptation of ideas and designs to afford one or more play patterns.

The application of play pattern design framework involved a scenographic practice-led approach combined with ideas drawn from the Design Thinking model (Cross, 2011) and Gordon's 'Synectic Think Cycle' which interconnects thinking approaches to problem-solving. The three 'Rs' – referring, reflecting and reconstructing – in the think cycle (Wake, 2009) is somewhat similar to Schon's ideas around 'reflective in action' and 'reflective on action'.

The framework was used in both *Into the Woods* and *The Runaway Hare*. The process involves selecting a particular play pattern based on the initial ideas for the scenographic objects or making a random choice. Next, creative ideas through sketches and prototypes for a new or an existing object with the play pattern affordances are generated. Then, the kinds of interactions they can facilitate in the installation and performance are explored. For example, how well does it work with the narrative and concept? How can it promote agency and sensory interaction in children and adults? After finding this process, other play patterns from Figure 3-1 were considered, and processing was repeated as well as considering how they combine with the original idea.

The play pattern framework is flexible; it is essential to bear in mind how it supports and is compatible with other criteria in the performance. The eight-play patterns (see Figure 3-1) work alongside the other design elements and requirements such as multisensory materials, pretend play, narratives, the physical environment and the user needs and abilities.

3.3 Sensory and Interactive Play Approaches

Design for sensory and play experiences is an essential aspect of the design approach. As outlined in Chapter 2, children experience and perceive the world through all their senses. The multisensory sensory affordances for touch, smell, sound, sight and movement were built into the design process from the start. The senses are interdependent, so the design also considers the relationship between the various senses and the physical and material properties of the objects. Materials are not just passive objects but affect the aesthetic and affordance for play and interaction.

Designing an open, participatory play environment raised questions on how a scenographer can create conditions for openness in play that is both embodied and performative. The relationship of how technology and play relate to each other is also explored as part of the studio practice.

This section encompasses many interdisciplinary studio practices and methodologies that are considered in this research. However, a scenographer's intentions for perceived interaction developed in a studio are not necessarily what may take place in an audience's reception of the work.

Therefore, the next section outlines the ethic and qualitative methods employed to find out how the audience engaged and how they can help in the ongoing process of generating 'new' knowledge

3.4 Research with and for Children

The children under three years old communicate and participate through embodied actions, verbal and nonverbal actions, gaze and gestures. Appreciating and

understanding these complexities is core to working with very young children. What does it mean to research with and for children? The National Children Bureau (NCB) defines participation as ‘the means, by which children and young people influence decisions that bring about change in them, others, their services and their communities’ (Shaw *et al.*, 2011, p. 4). The concern is not only about ‘participation’ but to try and understand how to achieve ‘genuine’ participation and ensuring and respecting the rights and the voices of the child participants. UNICEF recommends that the researcher asks the following questions:

- ‘Is the activity in the best interests of the child?’
 - Is any form of discrimination present?
 - Do the most disadvantaged and marginalised children have opportunities to participate and are their voices heard?
 - Are children genuinely participating?
 - Can children make a difference in decision-making processes?’
- (UNICEF)

These questions are also concern theatremakers. Throughout this research project, these questions are considered within the research study as well as within the way the performances are designed for participation. The aim is to try and understand how TEY audiences can experience genuine participation and how a child voice can be heard. These points address the second research question that asked: *what role does the scenography and performer have in helping support and encourage audience participation, in theatre for early years?*

3.4.1 Child-Centred Approaches

In the context of children’s rights awareness of participatory research practices increase, finding a suitable child-centred approach for very young children is not straightforward. For researchers in HCI and IDC, a user-centred approach with children and adults is embedded in their practice. Since 1982 papers have been published about children’s use of computers by the HCI community, the themes

covered are usually connected with pedagogy, accessibility, games and health. In these studies, children often play the roles of the design partner and contribute to every aspect of the interactive product. At the very least, the expectation is that the product is tested and evaluated by children (Zaman *et al.*, 2012). These evaluation methods used in most HCI are usually targeted at children over four years old who can talk. For younger children under four years, the ‘Technology Immersion’ method (Druin *et al.*, 1998) is more appropriate as it is an observational method and it can be used with large as well as small groups of children. Children are observed while playing in a ‘technology-rich, time-intensive environment’ – the researchers emphasise the importance of children as the decision-makers in the process and giving them the freedom to lead their play. Observations of young users’ activity patterns have been found to be useful in helping to develop new technologies, designs and features (Druin, 2002, p. 25). However, there has been very little research into digital and hybrid device use by very young children (under four years old) and HCI researchers are now beginning to carry out studies with very young children (Hourcade *et al.*, 2015). Many studies include some level of screen-based interaction, but they all employ observational methods, using field notes and video recordings. Researchers observe the children’s play, degree of engagement and fun through their physical expressions (Marco *et al.*, 2009; Cerezo, Marco and Baldassarri, 2014; Ellis, Power and Albrecht, 2018; Yamada-Rice, 2018) while some studies include consultation with focus groups of parents and professional experts (Høiseth *et al.*, 2013; Caglio, Lethin and Hashemian, 2016).

Similar to the HCI methods discussed, Clark and Moss’s (2005) ‘Mosaic approach’ is a participatory method used in early years for designing better environments and experiences for young children in formal learning environments (Clark, 2010). The approach considers a child’s sense of agency, where the child becomes the leader and initiators of their own experience like the ‘Technology Immersion’ method. Allowing children to have the freedom to explore can be adopted within a performance/installation environment and may go some way in helping the designer/researcher understand what scenography and objects attract a child’s attention.

Most audience research methods in theatre use post-show audience experiences collected through audience surveys or interviews and audiences are not usually consulted during the design or making of a performance (Bennett, 1997). However, these standard practices are changing, children's theatre companies such as Oily Cart (UK), Starcatchers (Scotland) and Theatre de la Guimbarde (Belgium) have formed long-term partnerships with local nursery schools discussed in Chapter 2. Audience consultation is now an integral part of their performance strategy (Brown, 2012; Fallon and van Loo, 2009). These theatre companies observe reactions, test their initial design ideas and get feedback from the children and carers during the making process and finally show them the results/production. This reciprocal relationship has been invaluable for the company; actors have also found this process essential for getting comfortable and working with children. The Starcatchers research project for TEY used a method called 'engaged signals' to assess their audience engagement. While at the same time, the children and carers get a better insight into performance practice. Child-led play is crucial within these research methodologies and helps to understand children requirements. However, to carry out this research so I can fulfil the aims of the project and balance the needs of very young children, the ethical requirements were considered and are discussed in the next section.

3.4.2 Ethics

An ethical rationale was provided as to why it was necessary to conduct this research with children, and the full detail of the research being undertaken was submitted to the University of Nottingham (UoN) School of Computer Science Research Ethical Committee, and full ethical clearance was gained. The adult participants were provided with the appropriate information sheets and consent forms (See Appendix 1 and 3). The researcher recognises that children are vulnerable, and we have a moral duty to keep children safe; the UoN and the research council's guiding documents were consulted, and procedures were put in place. The researcher, performers and staff at Lakeside Arts all had up-to-date Disclosure Barring Services (DSC) certificates. Lakeside Arts was our gatekeeper and provided access to young audiences and their families. The researcher undertook a course entitled 'Research with Children' at the UoN to further understand the implications of researching with young children.

As the children were too young and unable to provide their consent for participating in the research, consent was gained from their parents/carers. One of our key considerations was to communicate clearly the research aims and the importance of consent for participation to the parents/carers of all children who signed up. Prior to performances an email about the research study, including the consent forms, were sent to participants to give them time to read them. On arrival at Lakeside Arts, the researcher explained the purpose of the research, answered any questions and explained what would be happening during the session. The parents/carers of all the children attending were given consent forms to sign and all parents/carers gave their informed consent prior to the children participating in the study.

Also, in order to minimise emotional risk to the children, we made it clear to parents that participation was voluntary and that they could leave at any time, especially if their child felt uncomfortable, not happy or scared during the performance/installation.

Children whose parents did not want them identified in the images or videos in any public research outcomes were masked through drawings or faces blurred out of the images. All the original data, i.e. video and images, are stored on a secure drive at the UoN, accessible only by password to the researcher and her supervisors.

Studying audience reception is vital, and it can support the development of the designs of interactive scenography. The intention to link the practice-based and qualitative research in a real-world situation is discussed in the next section.

3.5 The Performance Studies

Two installation/performance events were designed, installed and tested in a real-world setting. Both events were in collaboration with the Lakeside Arts Centre in Nottingham, who provided the performance space, assisted in audience recruitment and advised during the design process. The performances/installations took place in the Performance Arts Studio, a flexible space with no fixed audience seating and an essential lighting and sound system. The first event *Into the Woods* was an open-ended

experimental, performative installation with two performers and the second performance *The Runaway Hare* was a promenade performance. They both addressed all three questions connected to interactive scenography, the role of the performer, audience interactions and narratives to varying degrees. For instance, *The Runaway Hare* had a narrative focus.

3.5.1 Into the Woods

The study of *Into the Woods* was aimed at children under four years old. Twenty children between 14 and 48 months and 22 parents/carers participated. It took place over two and a half days in February 2015 at the Nottingham Lakeside Arts Centre, in the Performance Arts Studio. There were eight sessions in total: Day 1 had two sessions, Day 2, two sessions, and Day 3 four sessions. They lasted 45 minutes. A total of 40 participants took part who were recruited through the Internet – Mums Net (Nottingham group) and Facebook websites, the University of Nottingham and Lakeside Arts Centre networks and by word of mouth. The sessions had between one and five child participants and their parents/carers. Two sessions had only one child participant; this was suggested in a meeting I had with Theatre-Rites artistic director Sue Buckmaster as a way of studying a children's initiative and interest without the influence of other children. The numbers in the other six sessions varied, keeping to a maximum of five child participants. On arrival, the researcher met the participants in the theatre foyer or the café and explained the aims of research to the parents/carers and children. They filled both consent forms for themselves and their accompanying child/children as well as a short survey about their child's current play activities (Appendix 1 and 2). On the third day, while the children's parents/carers filled in the consent forms, the children were offered a felt puppet friend with tilt sensors to play with while waiting and to accompany them into the installation.

3.5.2 The Runaway Hare

The six promenade performances took place over two days in January 2017 with a limit of 15 audience members per show. In total, 29 children attended: ten were under two years old, the youngest being 15 months old, and 19 were between two and three years old. The children are accompanied by one or two adults; in total 33 adults attended. The performances were free and were advertised locally and online. Around

six weeks in advance via Facebook, the Lakeside Arts Centre's website, Twitter, Mum's Net and through A5 leaflets placed at local venues including a library, messy playgroup and cafes, allowing for a more comprehensive recruitment strategy that in the previous study which proved successful. The performances were fully booked a week in advance. Mindful of the difficulties of reading paperwork while taking care of a very young child/ren, the information about the research project, venue and the participant consent forms were emailed to the participants. It provided an opportunity to read and sign the forms and to deal with any queries before the performance. On arrival, they were greeted in the theatre foyer and given a consent form if they had not brought one in, and the researcher addressed any issues or queries (Appendix 3 and 4). The post-performance questionnaire was emailed to parents/carers for feedback after their experience and to find out the post-performance effects on their child/ren. As a result, I received data for 20 out of the 29 children who attended (see Appendix 4).

3.5.3 Data Collection

The data was collected using two video cameras which enabled the researcher to capture children's engagement with the objects and to understand better how they made meaning from them. A fixed camera was placed at the back of the room day one to record a full view of the space. Then after that on the piano at the front of the room out of the children's reach. An additional roving camera operated by the researcher enabled the recording of close up actions. If the children seem uncomfortable with the camera pointed at them, it was moved away. Also, the research design included two parents' surveys and a semi-structured interview with the performer; more details of these are in Chapters 5 and 7.

The video recordings allowed for both verbal and nonverbal observation, multimodal interaction, gestures, facial expressions, gaze and body movements, providing a more detailed observation of frame-by-frame action and continuous interaction, especially for very young children.

3.5.4 Data Analysis

The video involved recording the participants' ongoing interactions and behaviours throughout the installation/performance. Video data takes time to review, and this

can be very time-consuming. In order to make a meaningful summary, a preliminary review of all video data was compiled into an index of events to provide an overview of the data collected (see Table 5-1). Each event summarised the participants' interactions, behaviour and responses, and identified the play patterns/schemas to help make sense of the participants' behaviour in context. The video index provides a quick overview of the video captured and the occurrences and actions of all the participants. It demonstrates how the participants interacted with the scenography, objects and the performers.

The index of events is reviewed, and a selection of significant vignettes/incidents are chosen to be revisited for further assessment and analysis. The overall selection in both studies addressed the research questions. The vignettes selection for further analysis demonstrates how the interactive scenographic elements were used in order to understand the participants and performers interaction better and play.

The first installation/performance *Into the Woods* was experimental and unscripted. The sessions consisted of open-ended play experiences. Nine vignettes were selected to demonstrate the participants' engagement and capacity to interact with the performer and other adults. The vignettes chosen are of atypical events that seemed surprising or significant. This study helped me to better understand children's/ user interactions for the future development of scenography and interactive spaces (see Chapter 5).

My experiences working with very young audiences and designing for them is limited. *Into the Woods* was pivotal for me to observe and learn more about children's behaviours and play early on in the research process. It was also a platform to test whether the play pattern/schemas can be recognised in the participants' action during the installation.

The Runaway Hare promenade performance follows a more structured storytelling format of interactive theatre performance than *Into the Woods*. The vignette selection was based on a typical and atypical scene in the performances (see Chapter 7). Two vignettes were chosen for each scene except for the shadow dome where the scenes

were very similar. Writing up the chosen vignettes used various methods and is discussed in the next section.

3.5.1 Observing and Reporting

The two reporting methods used to describe the participants' behaviours were the Critical Incident Technique (CIT) and the Narrative Method. CIT was first introduced by Flanagan in 1954. It is a method used for observing human behaviour in a way to 'facilitate their potential usefulness in solving practical problems' (Flanagan, 1954, p. 1).

'An incident is meant any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects. It is a flexible set of principles which must be modified and adapted to meet the specific situation at hand' (Flanagan, 1954, p. 2).

It has two basic requirements: (a) reporting of facts regarding behaviour, and (b) reporting should be limited to those behaviours which, according to competent observers, make a significant contribution to the activity (Flanagan, 1954, p. 29). A 'competent observer' is someone who is familiar with the events to be observed. CIT has been adopted by many different academic areas, including interaction design, but some academics have concerns about the word 'critical' and have replaced it with revelatory or 'significant' (Spencer-Oatey, 2013). Tripp believes that critical incidents occur in the way we look or critically observe action or behaviour (Tripp, 1994).

This helped to identify effective and ineffective issues with the interactive scenography and facilitated more objective observation/reporting of facts. It provided evidence for specific audience behaviours which helped to formulate suggestions for requirements regarding the needs of the audience in TEY, discussed in Chapter 8.

The Narrative Method is used in conjunction with CIT. It one of the techniques recommended for observing children at play; Susan Issacs first developed it in the 1930s (Bruce, 2001).

'The great power of naturalistic observation is that we can see what the child herself is interested in or curious about, and can examine her abilities in situations that are of emotional significance, interest or importance to her' (Dunn, 1991, p. 45).

It involves describing the events taking place in great detail; it is time-consuming but allows for detailed observation and reflection. The narrative used needed to deprioritise verbal communication. A multimodal transcription of the video recordings (Cowan, 2014) allowed me not only to describe what happened but also look at interactions through gaze, gesture, body position and sound.

The observation and consideration of 'nonverbal signifiers' are imperative for the understanding of very young participants. Observation does not happen in isolation; in considering what data lost in transcriptions, annotated video stills were used alongside the narrative in most of the vignettes. It helps to situate the event in a continuous flow with the audience and objects positioned in the performance space. Also, drawings were used to anonymise the images of some of the children. It provided the opportunity for closer observation of all the participants – the performer and children in the vignettes/incidents chosen for detail analysis. The audience observations provided the opportunity to understand how very young children communicated and participated in the two performances. In essence, the findings from the first performance are fed back to the studio practice to shape the design ideas for the second performance.

3.5.2 Limitations

Working with interdisciplinary methodologies and practising intersubjectivity in this thesis has not been straightforward. One of the difficulties lies in the tension between the objective and the subjective, being the insider/outsider, 'caring about the world

of research and world of (scenography) practice' (Hannula *et al.*, 2014, p. 67) and trying to bring them together to make sense.

Designing and making the performances as well as organising the study and recruitment was challenging to balance. I was sometimes too ambitious with the initial design concepts, especially in *The Runaway Hare*. For instance, if the second survey was sent to parents/carers earlier, I may have received more. For the studies having more fixed cameras may have been useful to capture the movement of the children in the open-ended play or even someone else using the roving camera may have provided the space to experience the performance live.

3.5.3 Conclusion

In order to pursue a child-centred approach, the scenographer must learn to become open to new design processes and methods. The methods discussed from the various fields can benefit from each other and expand the design pursuits. In the mixed method approach outlined, there is a blending of practice-based and qualitative methods, scenography and early years practices, HCI and scenography. With the play patterns framework as a resource, it becomes possible to open up the scenography and interaction design process with more alternatives that consider the user/audience perspective. An important benefit of qualitative data collection is to improve the outcomes of future performance designs and understand children behaviour and play in an interactive theatrical space. The analysis identifies children's interactions, play patterns, the relationship between the performer and audiences and solution for improving future designs.

In summary, this chapter mapped various methodologies used to research and explore making Theatre for Early Years more interactive. Each method adapted provided new information to support the overall research strategy and suggests a new understanding of approaches to study very young audiences. The results of the studies demonstrated how it could increase the creative scope of design and value for the audience. How the scenographer uses these methods in the practice of design is the subject of the next chapter that outlines the process for making *Into the Woods* scenography.

Chapter 4 INTO THE WOODS – DESIGN

Discussion of *Into the Woods* is divided into two chapters; this chapter covers the design and making of the individual scenography, while Chapter 5 reports on the installation/performance experience, design of the space, the audience interactions and the study findings. This first installation/performance was experimental – it was the first time I could observe very young children’s interactions with scenography and technologies. The *Into the Woods* designs explored how both novel and familiar scenography can promote agency and whole-bodied and intimate experiences. The design methodologies employed an artistic working method that relies on an intuitive approach to design, the tacit knowledge of the scenographer and the application of the Play Pattern design framework, multisensory material and interactive technologies (outlined in Chapter 3). I also organised several consultations with a creative team made up of HCI researchers, arts venue personnel, an object/ puppet theatre artist and the performer.

4.1 Design Approach

The design process began with an exploration of the natural world and reflection on the sensory and tactile nature of woods. It involved experimentation and exploration of sensory materials, developing visual ideas around the conceptual theme, experiments with different DIY technologies, prototype iterations and utilised play patterns as a design framework. The objectives were to:

1. Design and make tactile objects for the installation.
2. Experiment and embed various open-source hardware and software and wearable technologies into some objects.
3. Implement and test play patterns as a framework for design and interactions.

A typical children's performance project will begin with a script usually adapted from a children's storybook, and then interpreted by a creative team usually consisting of a scenographer, director, writer, and a sound and lighting designer. For this research project, I fulfilled most of these roles. For the exploratory design (without a script), I first adopted a multisensory walk in the woods as my theme. Some early year's theatre practitioners have found using a theme familiar to young children can help them feel more comfortable in an unfamiliar environment.

The decision to stage an experimental open-ended installation/performance instead of a structured narrative performance was based on providing opportunities for participants to freely play and interact. Consequently, the researcher would be in a better position to observe the children's interaction behaviours and find out what objects and materials attract their attention. Moreover, the findings will help the next phase to design interactive child-centred performance experiences and scenography based around a narrative. The design process involved sharing and discussing my ideas and prototypes with other theatre professionals, storytellers and a puppeteers/object artist who have experience working in children's theatre.

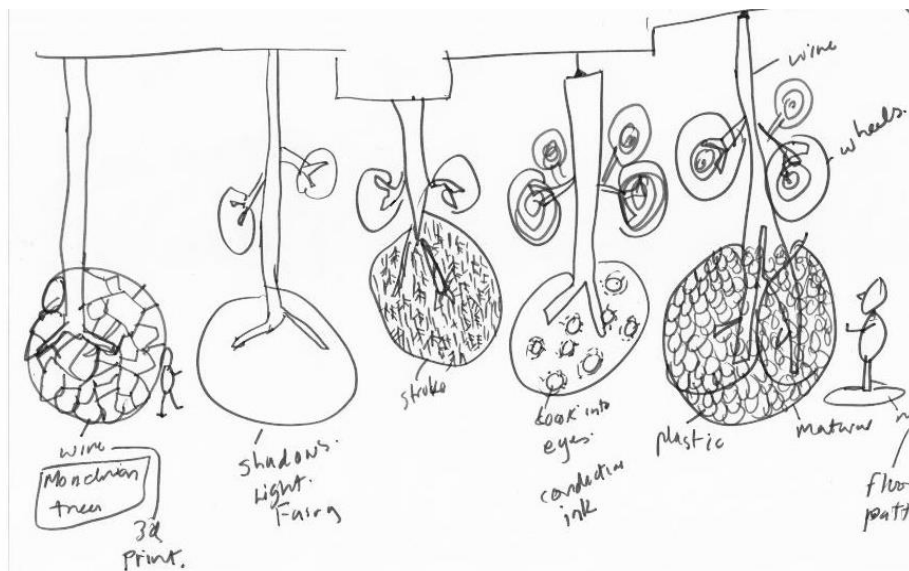


Figure 4-1 An early design sketch

The sketch in Figure 4-1 illustrates my initial design idea, which was based on upside down trees embedded with various sensors. However, in early discussions with the object theatre artist and my supervisors, this initial design prompted discussions and

concerns about limited audience interactions because all the objects were similar. The advice was to consider developing a more exploratory space that would investigate a variety of objects and interactions with the audience. The design was expanded into the whole space to accommodate a variety of materials and scenography. Five scenographic elements were designed 1) The upside-down trees in the drawing (Figure 4-1) developed into a more straightforward design, the suspended disc seen in Figures 4-2 and 4-3, 2) musical fruits and vegetables on a tray, 3) steppingstones that activated sounds, 4) felted hand puppet, 5) malleable multisensory materials discussed in more detail in section 4.2. This change, in the end, better served very young audiences as there was a greater variety of objects to investigate and explore their environment.

The scenography research took an agile, practice-based approach which depended on my tacit knowledge of scenography practice; this enabled me to start with visual research and thereafter experiment with different designs and embedded technologies. Ultimately a more structured approach of questioning and scrutinising the original design ideas using 1) the appropriate digital technologies; 2) application of the Play Pattern Framework; and 3) multisensory materials is discussed in the next three sections.

4.1.1 Interactive Technology

Digital DIY hardware and software were used experimentally. The intention is to extend the audience interactivity by embedding digital technologies in some of the scenographic objects. Various sensors were used for direct interaction with the audience, for instance, to activate lights, sounds or vibrations. The software and hardware used for the scenographic prototypes were intentionally selected to be low cost and accessible, to make it a more feasible and practical option for small and medium scale children's touring theatres. In addition, it was also my first experiments using interactive technologies; therefore, most of the microprocessors I used did not require any additional programming and had available open-source software with prewritten code. I used ready-made electronic kits and technologies that are marketed to digital maker communities such as the LittleBits, Kitronix wearable

sensors, conductive textiles, Bare Conductive touch board (Arduino) and conductive playdough.

4.1.2 Play Pattern Framework

Using a framework is a departure from my usual design process. The act of designing takes into consideration the play pattern in a deliberate way to critique and shift the object's shape and/or function. Keeping an open mind, the design is reviewed and explored in ways that the initial object's visual and functional properties can allow for and/or extend on in application of play patterns.

Patterns of Play	Example	Scenography
Transporting	Picking & moving up things and self	Suspended discs
Rotation	Exploring circular things lines, turning self	Stepping stones Felt puppets Sensory objects
Transformation	Exploring things that change	Suspended discs
Connection	Joining, separating, scatter or tie things up	Suspended discs Musical fruits Sensory objects
Enclosure	Covering self or other items, making dens	Stretch fabric
Trajectory	Vertical, horizontal, diagonal movement	Stepping stones
Orientation	Looking at things from different angles	Placement of objects in the performance space, some high and some low
Positioning	Placing objects or self in particular places	Suspended discs

Table 4-1 Table Play patterns, their meaning and the related scenographic object

Table 4-1 illustrates the play patterns and the scenography that I associated with them during the design process. Not all the play patterns were associated with the scenography during the design process – some were revealed through the audience interactions during the installation/performance (Chapter 5).

4.1.3 Multisensory Materials

Designing for the very young requires the objects to be flexible, lightweight, sensory and able to be grasped by tiny hands. Furthermore, very young children express themselves through their bodies, they make meaning and explore objects by touching, examining, mouthing, smelling, moving, rolling and hitting which were considered when choosing the physical and digital materials. As discussed in Chapter 2, materials play a part in the aesthetic and affordance of play and interaction.

heat	cold	hard	soft	light	small
rough	smooth	dry	wet	heavy	big

Table 4-2 Tactile and multisensory properties

I explored the materials with different haptic properties (Table 4-2) to discover their tangible and tactile affordances. I investigated the properties of contrasting materiality – soft and transparent materials such as felted wool and plastic wrap. The process became a play with the materials; for instance, felting: wool can either create flat or 3D surfaces. The scenographic objects were embedded with items with various surface types from metal washers to heat-sensitive smart materials to encourage tactile sensing.

Moreover, sound plays an integral role in performance design, and many productions will include a sound designer and composers in a creative team. For this installation, 20 different sounds effects were added to the scenography, and an ambient soundtrack was played in the background throughout the sessions.

The scenographic design process discussed next involved making prototypes, working with materials and trying out experimental ideas in the design studio. It outlines the design of the scenographic objects used in *Into the Woods*.

4.2 Scenography Process

The design for *Into the Woods* was based on the experience of walking in the woods – the audience encounters objects which represented trees, stones in an upside-down tree, puppet creatures. The main scenographic elements included 1) a number of

suspended discs which represented upside-down trees, 2) fallen musical fruits and vegetables on grass fabric, 3) stepping stones textured circles that activated a sound, 4) felted hand puppet creatures, 5) malleable multisensory materials.

The discussion is organised around the main design approaches 1) interactive technology options, 2) the play pattern framework, and 3) multisensory materials. These elements do not work in isolation but influence each other.

4.2.1 Suspended Discs

The design of the suspended discs was based on leaf-shapes and circular objects, two-year-old children's scribbles and mark makings, seed pods and kinetic mobiles that can afford rotation. They were detachable, flat, lightweight, flexible structures that can be suspended.

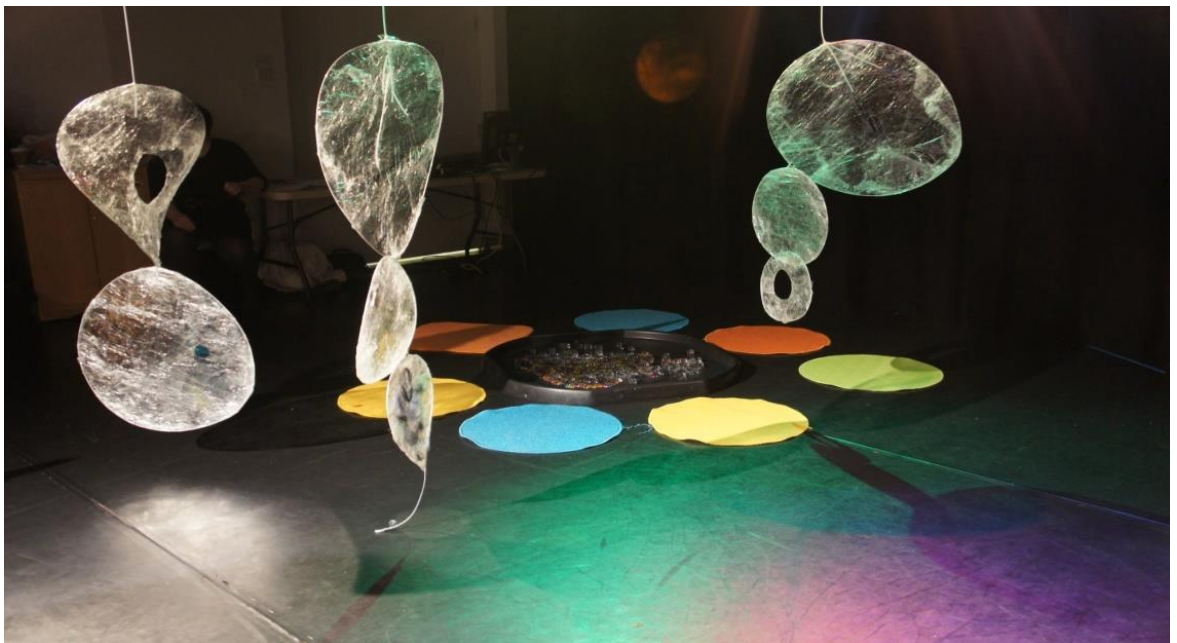


Figure 4-2 Suspended discs in Lakeside Arts Performance Studio

They varied in size from 150 to 20 cm in diameter and were made from bending fibreglass and carbon fibre rods into a circle shape (Figure 4-2). The circular frame was wrapped in several layers of clear shrink-wrap plastic and clear sticky tape (see Figures 4-2 and 4-3). The material is translucent and creates an aesthetic effect under theatrical lights.

When suspended from a single point, it affords kinetic movement. Magnets were attached around them to allow the participants to attach, detach, move and reconfigure the scenography. They filled the centre of the performance space and were light and flexible to enable the young participants to carry, move or drag them.



Figure 4-3 A child's viewpoint of the suspended disc

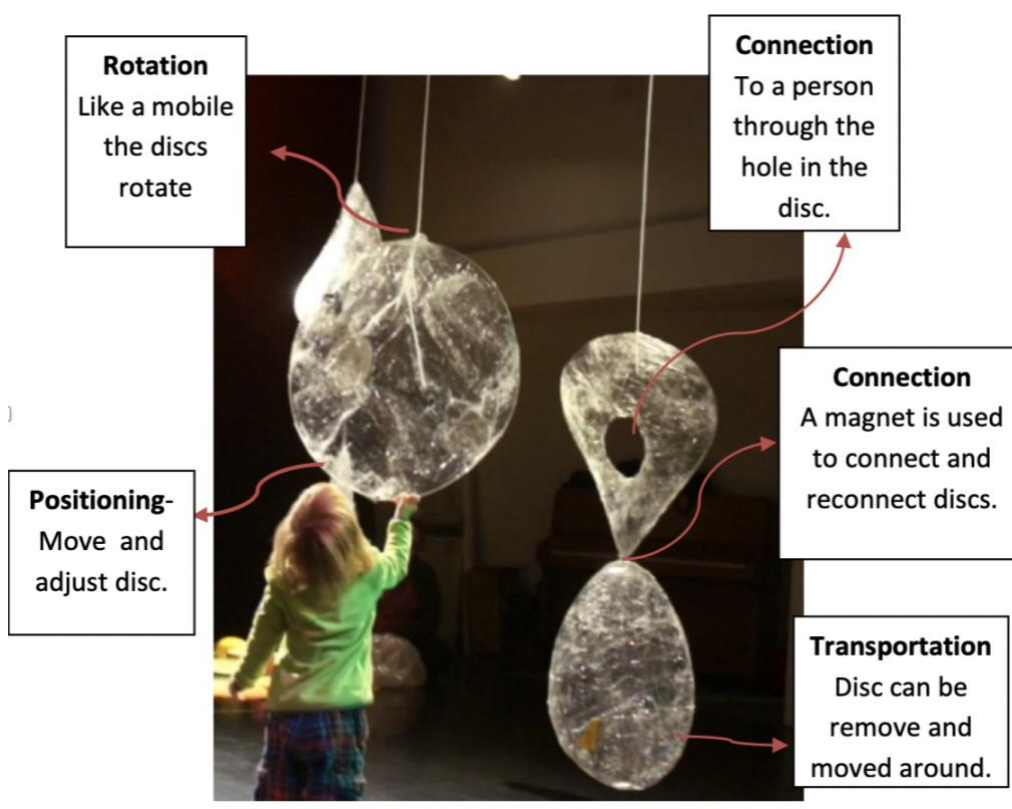


Figure 4-4 Play patterns application to the suspended discs

Play Patterns: Exploration of the connection and positioning of play patterns was afforded by connecting magnets around the circle, which enabled connection, detachment and repositioning as demonstrated in Figures 4-4 and 4-6. Some of the discs had small holes cut out on the surface areas to afford connections through playful interaction and peekaboo games.



Figure 4-5 Suspended disc with added plastic tabs to create a textured surface

Multisensory Materials: Several different tactile materials were added to the surface such as feathers, fabric and small strips of plastic, as seen in Figure 4-5 afford a variety of tactile and tangible interactions.



Figure 4-6 Suspended disc with magnets used by a performer and child



Figure 4-8 Circular tactile stepping stones, each one was designed with a different texture

Play Patterns: The trajectory schema was used to explore ideas around children's movement, such as the affordance of full-bodied interaction, i.e. jumping and running. This led to design research that explored stepping stones in rivers, forest floor textures, and dance mats, which in turn led to technology explorations of floor and force sensors.

Multisensory Materials: The 12 circular stepping stones were made from black felt. The felt surfaces were covered with different tactile materials such as hard buttons, heat-sensitive materials for making handprints, soft pom-poms, cold metal washers, rough fabrics, sandpaper and rubber gloves for a multisensory experience as seen in Figure 4-8. The materials were hard, soft, cold, warm, bumpy and rough for haptic multisensory exploratory play.

4.2.3 Musical Fruit and Vegetables

A large tray of fruit and vegetables (Figure 4-9) that activated sounds when touched – everyday objects were given life through sound, which added a sense of magic to the atmosphere. Real fruit and vegetables became tactile capacitive sensing interfaces that enabled pre-recorded sounds to play when touched.



Figure 4-9 Multisensory experience of different fruit and vegetables

Interactive Technology: The fruit and vegetables were controlled by a bare conductive Touch board (microcontroller) that used capacitive sensing, influenced by Makey Makey projects that used microcontrollers and sensors with real objects. The ten fruit and vegetables were converted into tactile capacitive sensing interfaces that enabled pre-recorded sounds to be played, sounds that can be heard when exploring the woods and in urban areas (birds, child's voice, trains, etc.) to play when touched. Wires were attached to the fruit and vegetables and connected directly to the 'Touch Board' the speaker was hidden under the grass fabric (Figure 4-9 and 4-10).

Play Pattern: The fruit and vegetables were associated with the connection play pattern. The connection, in this case, was made through touch and capacitive sensing.

The particular sound effects were deliberately chosen to create a connection to the imagined images, objects and people.



Figure 4-10 The Fruit and Vegetables connected to the Touch board become capacitive sensors.

Multisensory Materials: Real fruit and vegetables were used as they are familiar to children and are not expected to make sounds (see Figure 4-10). Practitioners in early years theatre found using familiar objects and stories connected to very young children's everyday reality can increase engagement (Brown, 2012). I choose different sizes of fruit with smooth or rough skins, different colours and some in bunches. They were placed on a large tray covered with green furry grass fabric which contrasted with the fruit.

4.2.4 Felt Creatures & Puppets

A series of small felted creatures were made using wearable technologies to animate various characteristics – they were designed with computational capacities but could be worn like hand puppets by the participants or the performer. The five smaller ones had wearable tilt sensors (Figure 4-11, C) that activated light and the larger one (Figure 4-11, A) had an accelerometer that activated the frequency and brightness of the lights. A sound-activated vibrating felt object that was placed in a small cardboard

suitcase with the hand-written words ‘Talk to me’ on the top as seen in Figure 4-11, B.

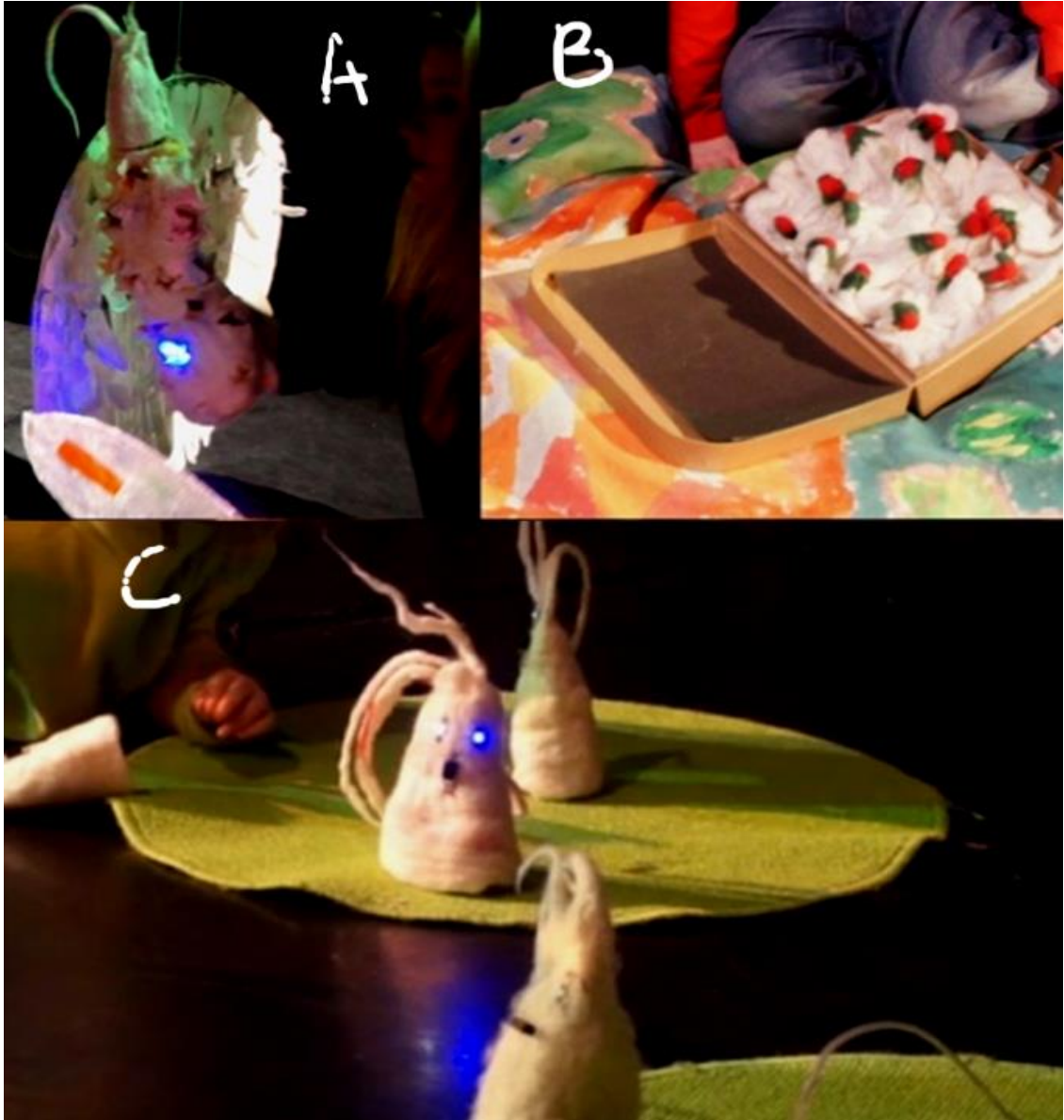


Figure 4-11 Three Felt Puppets – A felt caterpillar, B Suitcase Creature, C felt puppets

When the suitcase lid was opened, and the participant made a sound, it lit up and vibrated to make it appear realistic. Inspired by the work of the German artist Anette Quentin-Stoll I experimented with more structural forms and shapes, layering and cutting into the form to reveal additional colours and embedding wearable technologies. The small felt puppets were inspired by the shape of a trumpet and tulip;

I crafted small white felted cone-shaped objects with stems using wet felted craft techniques.

Interactive Technology: The system used soft circuits, wearable technology, hand puppets – tilt sensors activated their LED eyes. The puppets were all mobile and embodied the transportation schema. Inspired by this I developed other ideas around transformation and light – an accelerometer connected to an ‘Arduino lily pad’ activated the frequency and brightness of the lights in the larger caterpillar-shaped puppet (Figure 4-12). A sound-activated creature in a cardboard suitcase box was inspired by the enclosure schema and made from felt and LittleBits modules – sound sensors, a vibration module, and LEDs.

Play Pattern: I considered transformation and trajectory play patterns for all the felted objects. They were all soft, small mobile objects designed to be flexible and lightweight. They can be transformed through audience interactions. I experimented with wearable LEDs to explore ideas around animating an object, and that led to transforming the felted shapes into hand puppets to help promote storytelling and pretend play.

Multisensory Materials: Each of the felted objects had different multisensory affordances. The felt puppets could be worn on a hand; for the suitcase creature, voice/sound is used for activating the lights. A further and equally important element was integrating a sense of smell, and a fruit fragrance was added to the felt objects in the suitcase. A scent is difficult to isolate if used in an open space, so containing it was necessary. The caterpillar was made to be worn, and lights reacted to the speed of a person’s arm movements, as seen in Figure 4-11.



Figure 4-12 Work in progress, the felt caterpillar used wearable technologies – lily pad microcontroller (mini-computer), accelerometer and LEDs.

4.2.5 Malleable and Sensory Materials

The exploration of malleable and sensory materials provided opportunities to explore and manipulate material qualities. Conductive play dough, wet water beads, ice, inflated blue surgical gloves with lights inserted and dressing up cloaks and stretch fabric were introduced on different days.

Interactive Technology: There were minimal technology elements used in this area, and conductive playdough and LEDs were used on the first day only.

Play Patterns: Transformation, transportation & connection (Table 4-1) were associated with these objects. I was interested in observing how young children use materials that can transform, stretch, mould and be easily deformed.



Figure 4-13 Playing with gel-like water beads which are wet, soft and cold to touch.

4.3 Conclusion

The purpose of *Into the Woods* was to design an experimental installation/performance in order to test initial design ideas, play with interactive technologies and test the play pattern framework. The scenography practice carried out utilised a variety of sensory materials including felt, plastics, real natural objects such as fruit

and vegetables, metals, ice, rubber, stretch fabric and heat-sensitive material. I experimented and explored open-source hardware and software and how they can be embedded in scenography. Using DIY technologies helped me gain more confidence in working with them and embedding them into the design phase. The play pattern framework worked, extending the scenography and my design process. As a design tool, it helped to develop more complex objects, especially in the case of the suspended discs.

The next chapter explores the spatial design of the scenographic objects discussed in this chapter and how they were organised in the Performing Arts Studio at Lakeside Arts. I discuss the roles the venue, the performers and audiences played during the installation/performance and outline the research study design, deployment, and finally evaluate and discuss the findings.

Chapter 5 STUDY 1—INTO THE WOODS

5.1 The Design Intervention

Into the Woods is an experimental installation/performance. This chapter discusses how the audience interacted with the scenography and the findings of the study. I worked in collaboration with the Nottingham Lakeside Arts (gatekeeper), in particular with Rachel Feneley, the Learning Officer for Drama and Dance. She assisted in recruitment, setting up the installation, lighting design, and taking field notes during the study. The performance studio space, including the technical support, was made available for the eight sessions over two and a half days in February 2015. It was invaluable as it provided the facilities of a professional theatre setting rather than a laboratory setting.

5.1.1 Installation Layout

The Performing Arts Studio is on the ground level at Lakeside Arts with large windows on one wall and a mirror on the other. In order to enclose the space, the black theatre curtains were drawn, and theatre lights created an atmospherically lit space (Figure 5-1). The final layout of the scenographic objects was decided onsite on the first day of the performances. The studio space was divided into five areas with different scenographic elements. The suspended discs connected and overlapped the other areas; some of them were hung low so children could reach and remove them. The scenography was organised to promote a variety of activities – group, intimate and more physical play. The multi-patterned cushions and mats surrounded the trays of musical fruits and vegetables and malleable materials offered the audience the opportunity to sit down, thus created the potential for group activities. The suspended discs and the stepping stones had ample space around them so participants could be more physical play, for instance, run, jump, pull or push (suspended disc), (Figure 5-1). The felt puppets were small and afforded intimate play (alone or in pairs).

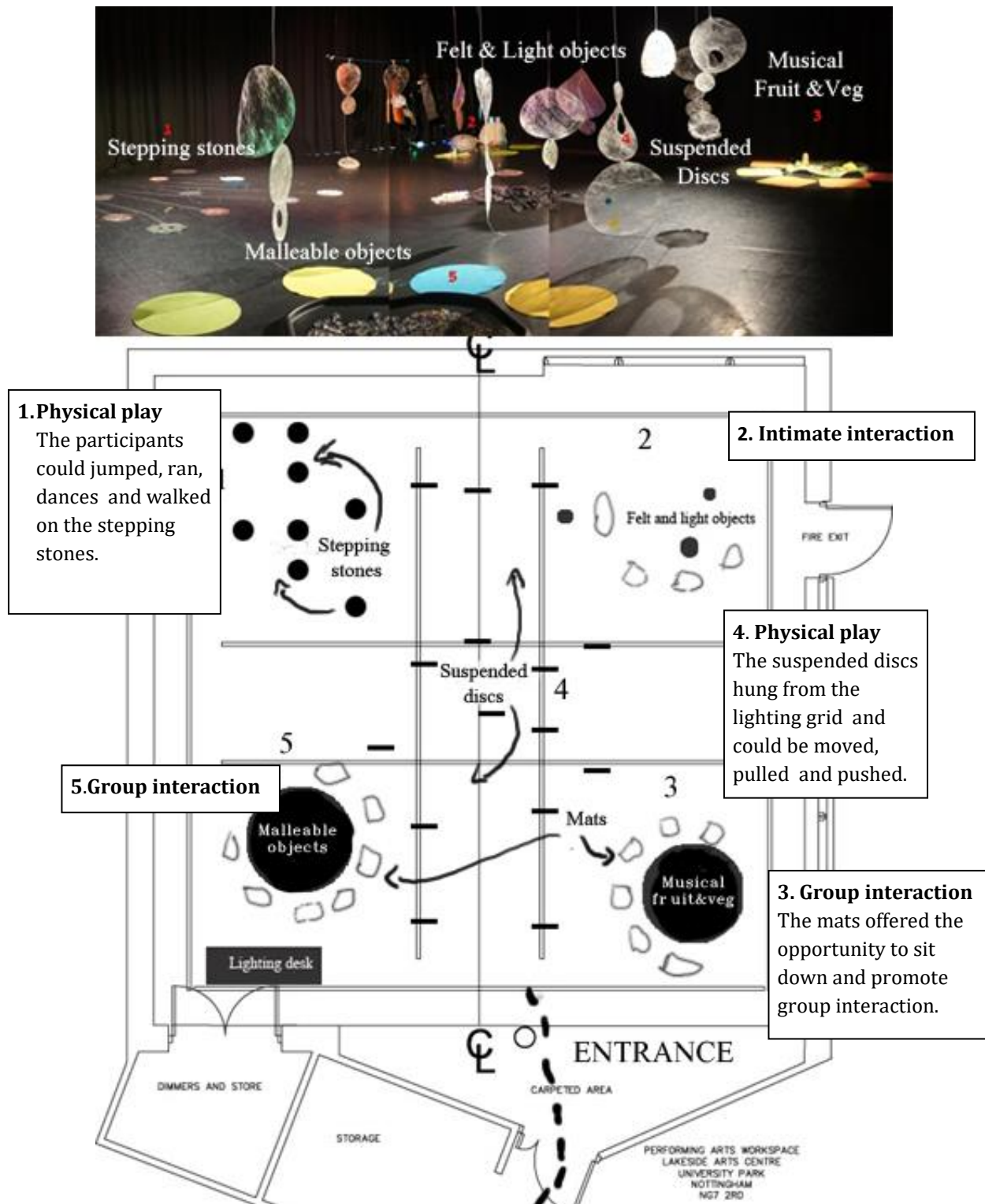


Figure 5-1 The performance studio space layout and a plan 1) Stepping stones 2) Felted hand puppets and light objects 3) Musical fruits and vegetables 4) Suspended discs 5) Malleable objects.

5.1.2 Performers

The two performers who volunteered their time are experienced in object theatre and performing arts for children: Sophie Johnson-Hill and Sean Myatt. For the first two days, only one performer was present, and on the third day, the two performers worked together. Sophie greeted the children and adults in the foyer and led them into the performance arts studio. *Into the Woods* is a devised experience, so there was no set script, the playful ideas and performers actions come from their direct interactions with the participants. In essence, this is different from conventional theatre practice. This allows everyone, the performer and the participants, to get involved and collaborate to create a new experience. There are few rules in devised performances and no common starting point for action. However, despite the sense of freedom, this process still required a leader, and for this research project, the performers played this role and acted as facilitators or guides to inspire play. They used improvisation techniques to help encourage the children. Their role was to:

- Initiate playful activities with objects.
- Improvise and imitate the child's actions in order to facilitate co-construction of stories and experiences
- Explore and follow the young participants' play or movements, becoming one of them.

This technique allows for a great deal of imagination and is used commonly by street performers and actors working with very young children. Although the installation was organised for open-ended play, the performers played an important role. I was interested in observing how children interacted with a performer and how the performer used objects to encourage them to interact, particularly for the further development of interactive scenography.

5.1.3 Participants

The study was aimed at children under four years old and 20 children between 14 and 48 months and 22 parents/carers participated. They were recruited through the Internet – Mums Net (Nottingham group) and Facebook websites, the University of Nottingham and Lakeside Arts Centre networks and by word of mouth.

Participant Child	Age	Gender	Adults	Installation/ Performance
PC 1	26 months	M	1	Day 1 Session 1
PC 2	21 months	M	1	
PC 3	25 months	M	1	
PC 4	44 months	F	1	Day 1 Session 2
PC 5	42 months	F	1	
PC 6	48 months	F	1	
PC 7	26 months	M	1	
PC 8	41 months	M	2	Day 2 Session 3
PC 9	32 months	M	2	Day 2 Session 4
PC 10	22 months	F	1	
PC 11	20 months	F	1	
PC 12	30 months	M	1	Day 3 Session 5
PC 13	34 months	F	1	Day 3 Session 6
PC 14	17 months	F	1	
PC 15	35 months	M	1	
PC 16	49 months	F	1	Day 3 Session 7
PC 17	18 months	F	1	
PC 18	34 months	M	1	Day 3 Session 8
PC 19	48 months	M	1	
PC 20	18 months	M	1	

Table 5-1 Participants Demographics

The sessions had between one and five child participants and their parents/carers. Two sessions (day 1 and day 3) had only one child participant, to study a children's

initiative and interest without the influence of other children. The numbers in the other six sessions varied, with a maximum limit of five child participants at one time.

5.2 The Deployment

The study took place over two and a half days in February 2015 at the Nottingham Lakeside Arts Centre, performance studio. There were eight sessions in total: Day 1 had two sessions, Day 2, two sessions and Day 3 four sessions. Day 1 had two sessions, Day 2, two sessions, and Day 3 four sessions. They lasted 45 minutes, and a total of 40 participants took part as seen on participant demographics Table 5-1.

5.2.1 Research Ethics

All participants gave their consent as well as their child's to take part in the installation and photographed and video recorded. They were all informed of the study context and how their data would be used. On arrival, I greeted the participants in the theatre foyer or the café and explained the aims of research to the parents/carers and children. They filled consent forms for themselves and their accompanying child/children as well as a short survey about their child's play activities (Appendix 1 and 2), (Table 5-4). On the third day, while parents were filling consent forms, children we offered a felt puppet friend with tilt sensors to play with while waiting for their parents/carers to accompany them into the installation.

5.2.2 Procedure

The participants gathered in the theatre foyer. The performer led them into the corridor outside the performance studio. Before they entered, she told them that when she arrived in the morning, she noticed that something had happened during the night and things were acting strangely. She reiterated that she needed their help to find out what happened. This scenario was included to help the participants make sense of the installation and to create a context for engagement. Some children's theatre companies start their show in the foyer, and it seems to relax and familiarise the children with the actors in a neutral and well-lit space. In this performance, it seemed to help heighten their anticipation when the performer encouraged the children to peek through the glass pane on the door (Figure 5-2). She also explained

to the grown-ups and children that they were free to go anywhere they liked; they could play and touch all various objects and scenography.



Figure 5-2 A) The performer and children peek through the glass door pane. B) The performer looks back at the children and encourages them to enter the performance studio at Lakeside Arts.

On entering the performance space, most of the children were happy to take off their shoes and walked around in their socks (Figure 5-3). All the participants interacted with space for 45 minutes until the house (working) lights were switched on to indicate the end of the experience. The parents/carers were then gathered in one corner of the room by the researcher who thanked them for their participation and explained about play patterns and the design intentions. They were then offered an information sheet about play patterns, and each child was given one finger light to take home.

The scenography in the space was then reset for the next session. At the end of each day, the performance studio was emptied as it was required for other activities the following day. The researcher, performer and Learning Officer from Lakeside Arts reviewed and discussed the day's activities. The researcher then made decisions to adjust, discard or add other objects to the next day's study. It was possible because the session took place every other day in a week: Monday, Wednesday and Friday. The

other two days Tuesday and Thursday were spent making and further developing the prototypes, for instance, adding lights to the felt puppets for the Friday performance.



Figure 5-3 Participants entering the performance studio, on Day 2, Session 1

5.2.3 Data Collection

In addition to the two video cameras that captured the data (see Chapter 3), field notes for each session were taken by Learning Officer from Nottingham Lakeside Arts. She has experience working with very young children, in nursery and arts settings. Carers/parents also completed a short survey with two questions about their children and their play activities. It enabled the researcher to gather information about what the young participants play within their make-believe activities. The resulting data comprises a log of the events (Table 5-2) and a more extensive anonymised video transcript of nine significant vignettes. The entire data set was compiled into an index of events to provide an overview of all the data collected for the six installations/performances (see an example in Table 5-1). Each event outlined the participants involved, where they were in the room, the object/s that they were using and a summary of actions. The overall summary reports on all the occurring events during the three days and reflects on what could be improved. These data help to identify the popularity of the objects, log the play patterns in the participant's actions and select the vignettes for further analysis (see Table 5.3).

Video reference	Position	Participants	Objects	Interaction	Summary of Actions
Study Day 1, 11:30 pm MAH04619 (handheld)	00:00- 01:12	All 3 C&3A	Musical fruit & vegetables	Touching fruit	Interested in speakers, lose interest when the fruit did not work, soundtracks long, surprised by the sound, PC3 mother communicated by asking him what kinds of fruit were in the bowl. PC1's interest drawn to performer One; child particularly interested in the speakers and seemed surprised about the magnets on them and thought he could control the sound by touching them together.
Study Day 1, 11:30 pm MAH04619 (handheld)	01:55-2:44	Performer & PC1	Suspended discs	Hiding behind	PC1's eyes caught the performer and followed her to play, hide and seek; he gazed towards his mother.
Study Day 1 11:30 am SANY0005 (fixed position)	03:20:00- 04:26	Performer & PC1 Mother & PC2	Suspended discs	Hide and seek	PC2 observed PC1 playing with a performer – hide and seek and imitated similar play with his mother moving across the room holding on to the disc and saying 'boo' – laughter (imitation). Moves on to the area with small interactive props but then look at the researcher, draws closer to his mother and moves away (noticed throughout session 2 – interaction with child and performer was minimal.)
Study Day 1, 11:30 pm MAH04619 (handheld)	04:35:00- 05:04	Group	Musical fruit & veg	Touching and looking	Children touched the wires connected to the fruit and PC2 tried to eat the fruit.
Study Day 1, 11:30 am SANY0005 (fixed position)	05:36-07:29	Performer & PC1	Soft felt object	Playing and looking	PC1 looked at the object for a few minutes and then left them, returned to interact with the performer.
Study Day 1, 11:30 am. MAH04623	0010:00- 03:52	Mother & PC1	Stepping stones	Touching circles and textures.	PC1 touched the stepping stones, went off to play to try and play with PC3 imitating his action on all fours. Performer imitated play by jumping on circles, other children observed and moved over to play. PC3 looked but did not interact. (The circles needed a more sensitive pressure sensor as not all of them performed and some did not have sound attached and this created, some confusion.)

Table 5-2 Example of the index of events

5.2.4 Data Selection

The selection process included choosing at least one of the major scenographic objects. I then considered how the object/s was connected to a child or children's behaviours and checked to see if the resulting actions were atypical, seemed significant or surprising or I wanted to find out more. For the selection, I also reflected what action would allow a better understanding of the role of technology and interactions with the scenographic object, leading to the potential to generate future designs. Finally, the events illustrating the capacity of the young participants to interact with a performer were chosen. Next, I outlined the reasons for selecting each individual vignette on Table 5-3.

Table 5-3 Reasons for vignette selection categorised by scenographic objects

Scenography	Reason for Selection
Suspended disc	Vignette 1 – Wearing the scenography <ul style="list-style-type: none"> • Demonstrates a child's imaginative use of a scenographic object • An ambiguous object's use and meaning changes • The affordances of magnets and detachable objects • Children observe each other and their actions. • Communication between a child and parent
	Vignette 2 – Verbal and nonverbal communication <ul style="list-style-type: none"> • Demonstrates sustained role-playing by a child • A trust relationship between a child and the performer • Importance of a parent introduction • Child leading play with the performer
	Vignette 3 – Design and usability <ul style="list-style-type: none"> • Incident demonstrated a child playing with the suspended disc • Highlights usability and design issues • Child leading play

Table 5-3 continued

Scenography	Reason for Selection
Musical fruits & vegetables	Vignette 4 – Sound & communication <ul style="list-style-type: none"> • The affordances of touch and sound • The potential of sound to activate a narrative; one to one interaction with a very young child • Example of hand gesture recognition
	Vignette 5 – Group interaction and imitation <ul style="list-style-type: none"> • Turn-taking in a group • Demonstrated children observation and imitation • Parental acknowledgement & scaffolding • The use of vocalisation of action • Children’s curiosity
	Vignette 6 – Curiosity <ul style="list-style-type: none"> • Curiosity about how things work • Child capacity to reconstruct and learn through play • Example of an older child’s interactions (four years) • Child lead play with the performer • An example of popular childhood games
Stepping stones	Vignette 7 – Looking for sound <ul style="list-style-type: none"> • Embodied and intimate interaction • Curiosity in a young child • A conversation about the object properties • Imitate and follow • Potential for cueing sounds
Felt Objects	Vignette 8 – Peekaboo with Noisy Suitcase <ul style="list-style-type: none"> • An example of the competence of an 18-month-old child • A sustained period of play with the performer • The affordance of mobile objects • Adapting a familiar game like peekaboo • Demonstrates how very young children initiate play • Enjoyment of repetitions
	Vignette 9 – Role Playing: Peter the Puppet <ul style="list-style-type: none"> • Sustained play with the performer • Example of improvisation of an everyday occurrence • Actions centred on the puppets as characters • Real and imagined play interchange • Performer negotiating play with a child • Technology affordance to create life in a puppet

Each vignette describes and reports on the multimodal interaction of the participants. A multimodal transcription facilitates both verbal and nonverbal signifiers such as gaze, gesture, body position and sound. These were especially important with very young child participants, some of whom spoke very little and communicated through gestures, utterances and their body language. The transcription describes the participant's actions before and after a particular vignette. It allows for tracing the cause and repercussion of an action. For the transcription, the vignettes from both camera viewpoints were rendered side by side. It accommodated an overview of what was happening in the space and a detailed view of the specific vignette.

Sections of video clip were viewed frame by frame in order to observe the participant's gaze and body position. Annotated video frames and diagrams were used to illustrate the participant's movement and actions further. The process is very intensive and time-consuming but allows for greater clarity of the actions.

5.3 Evaluation

Overall, the open-ended, playful, relaxed nature of the installation seemed to encourage engagement with digital and non-digital objects, and most of the children spontaneously interacted with all the objects and the performer was fully occupied during the 45-minute session. However, three children stayed very close to their parents/carers and were not interested in interacting with the performer or the group but were actively looking on and at times imitating activities they had seen. Some children were more occupied with one particular pattern of behaviour or object more than another, and they exercised their preferences by coming back to play with that particular object.

5.3.1 The Suspended Discs

Overview

The suspended discs (SD) were non-digital objects but the most used object by the child participants. They promoted embodied interaction and imaginative play. By suspending the object, the child used their full body to interact with it. The ambiguous design and its physical properties – size, transparency and openings in the disc encouraged and inspired imaginative, open-ended play. The flexibility in design helped the child participants physically re-appropriate, reinventing and constructing them to suit their ideas and stories. They applied the ‘what if’ to the SD, and it became a train, mirror, wings, hat, wearables or just a construction part of connecting and disconnecting. The next three vignettes explore how the children used the SDs in their play with and without the performers and reveal their flexibility, usability and limitation.

5.3.1.1 Vignette 1 – Wearing the scenography

Vignette 1 follows the action of a child participant who wears the suspended discs on a few occasions. It challenges us with questions of what caused her to notice the disc, why did she put her head through it? The child was familiar with the discs –she used them previously as butterfly wings with the actor (Figure 5-4).



Figure 5-4 A child is helped by the performer to make the suspended disc into a pair of butterfly wings



1) As PC15 is running she notices the large disc with a hole that PC13 lowered earlier.

2) She turns towards it, walks with her arms outstretched in front of her.

3) Grabs it, lifts it up, looks through it, then lifts it over her head and puts her head through, with a wide smile, with

4) Both hands holding on to either side of the disc. We hear the sound of an adult laughing, it draws all our attention to the incident, PC14 starts to laugh along with her; PC15's mother and her baby also look at her

5) She turns around to face her mother (who is at the back of the room), she lets go of the disc, and it rests on her shoulders, she triumphantly stretches her arms out to her side and shouts 'Mum'.

6) (Extract from the *video data transcript* of day 3, session)

Figure 5-5 Vignette 1 the sequence shows a child's actions – noticing to wearing the disc.



Figure 5-6 The performer tries to imitate PC15, PC15 looks on triumphantly

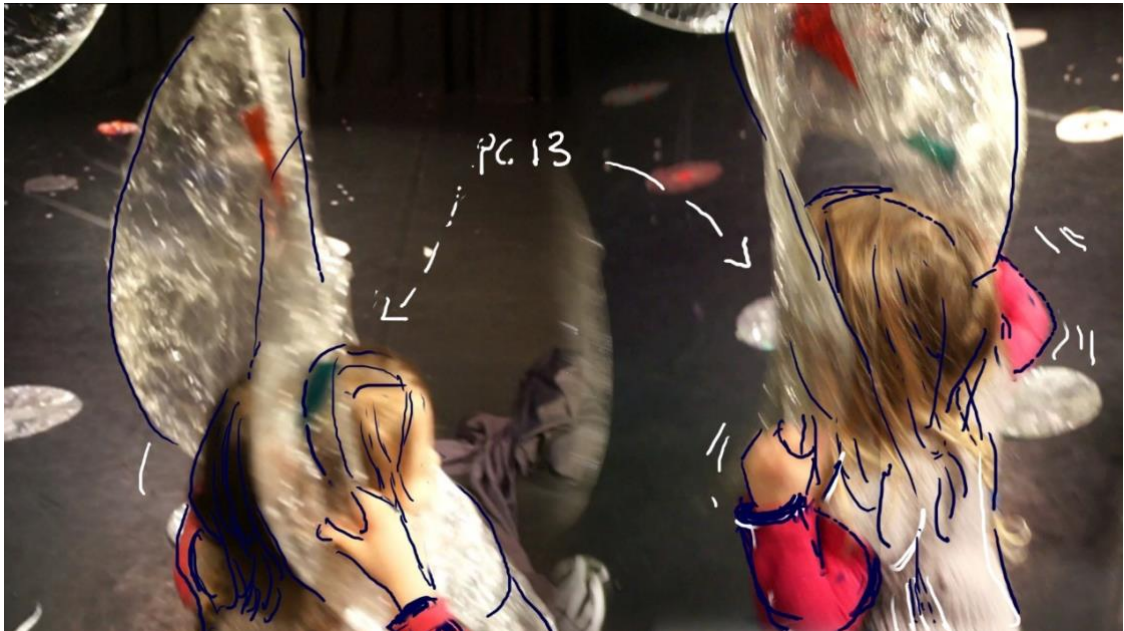


Figure 5-7 PC13 imitates PC15's action and tries to put the disc through her head

The child's action in the vignette occurred because of a series of events: first, another child lowered the disc and when it became more accessible in conjunction with the

hole designed in the disc and or the movement of it caught her attention and made her turn. All these factors or the combination of them are possible. Everyone in the room is looking at the child. Her actions lead to series of other similar acts; within a minute a performer imitates the child (Figure 5-6) and, parallel with his actions, the child who lowered the disc earlier tries to imitate by wearing another the disc with a hole (Figure 5-7).



Figure 5.8 PC15 and the performer play a game of going on a train journey

Also, in two other occurrences, the child that instigated the action of putting on the disc repeated this action. Later on, she spontaneously puts on a disc to indicate being inside of a train (See Figure 5-8). These events indicate how the child makes meaning of an object; she first wears it on an impulse, then repeats this action, but then on the fourth time the disc becomes a functional object for it in her game with the performer.

Another significant occurrence highlighted by this incident is this child's need for her actions to be acknowledged by her mother and not only by others in the room. The need for reassurance – checking in – was recognised in some children under two. They often will go off to play by themselves or with the performer, but will always

look for their parent/carer, and at times went back to them for a hug or called them to join them. The role of the adult, either the performer or the parent or both, to stimulate play opportunities is an important one and is seen in the next vignette where a young boy builds up the confidence to lead his play without saying a word.

5.3.1.2 Vignette 2 – Nonverbal communication

In the following vignette, we encounter a young participant who throughout most of the session, is pretending to be a dog. He only crawls and moves around on all fours and communicates by pointing or barking. He sustains this pretend to play for most of the session, and then moves towards the middle of the room. He spent the first ten minutes observing and crawling around his mother, who is taking care of his baby sister. He eventually decided to make contact with the performer and played with her for some time constructing the discs by attaching them with the magnets. When she goes to play with someone else, he uses the suspended disc to get her attention, as seen in the excerpt in Figure 5-8.

This vignette reveals the young child's capacity for sustained role play and how he draws the performer's attention to himself through his actions, like a dog dropping the ball in front of its owner he drops the disc in front of the performer. In the first 15 minutes of the session, he did not join in any of the group activities. Even when an 18-month-old child followed his actions, by crawling on all fours around the room. However, like with other child participants, he would stop and actively look at how the performer played with other children. Before this vignette, while on his mother's lap, he made direct contact with the performer through engagement with the small cardboard suitcase. After this initial contact, the performer decided to imitate him and at this point, he began more actively playing with her.



Figure 5-8 Vignette 2- Non-verbal communication

They began the game by constructing the suspended disc together, while his mum was on the other side of the room. He gradually gained the confidence to interact with the performer to the extent he took the initiative in the above vignette to get her

1) The young boy crawls around the stepping stones, he sees the performer and says 'woof'. He stops and, on all fours, he looks in front of him and notices something then he lifts his body upright and scuffles on his knees to a large suspended disc he holds the disc with one hand and pulls it away from the attached disc. He turns around holding the disc with both hands and shuffles on his knees to the performer who is playing with another child and his mother. The young boy reaches the performer and holding the disc in his right hand, he tried to hand it to her, but other children are competing for her attention now. PC drops the disc on the floor in front of the performer. She asks him something (not audible in the data). Both her hands are open with her palm facing upwards resting on her knee as if she asking a question – what shall we do with it?

2) The boy crawls over to the previous disc, he attaches it, and he looks at her, then the performer pushes the discs on the floor towards him, and he reaches for it with one hand.

3) He moves it to the bottom of the chain of discs.

4) The performer gets up and moves towards him and they both play together, attaching discs together along line.

(Extract from the *video data transcript* of day 1, session 1.)

attention to playing with him, and this continued for 20 minutes till the end of the session. His urgency to find and attach the disc seemed to propel him to move away from being on all fours to running around on two legs in the last four minutes of the session, seeking and transporting discs to the performer. The discs seem to engage the children in very different ways and for an extended period as described above. However, there were some usability issues encountered with the SDs which caused distraction and disappointment as seen in the next vignette.

5.3.1.3 Vignette 3 – Design and usability

In the centre of the space, PC13 has been playing with the suspended discs for a few minutes, she approaches a set of three discs, and she pulls off two, leaving one hanging in Figure 5-9. The magnets and lightweight material used for the SD affords easy detachment, reconstruction and movement. Placing them at different heights facilitated a harmonic relationship between the discs and promoted embodied interaction (reaching, pulling, hitting) as seen in Figure 5-9. The child participant showed determination and motivation to get hold of the attached disc. She found it easy to detach the first two discs; her smiles reveal how she felt about the experience, but then her attention turns to the third disc which was attached by nylon string to the lighting bar and not designed to be detached.

There was no visual indication that this disc could not be detached, even under her closer examination (Figure 5.9) her failed efforts would seem confusing. When the same types of objects have different constraints, it led to confusion and frustration for the user as seen from her body action of hitting it in defiance and doing something else. In effect, this results in limiting full engagement and playability with the object of her attention. The way the third SD was connected was questioned by children in other sessions who tried to pull it down. PC12 said while looking up at the grid 'I know I just saw something perhaps that might be it, a string connecting to it'. In this case, he solved it and did not pursue detaching it, however, regarding the design and usability, objects which look the same but have different fundamental constraints or functions should be made more visible to avoid disappointment or to curtail a participant's experience.



1) PC13 slowly lifted her head upward, something has caught her eye; she seems to be examining why the third disc (a larger SD with hole) is still hanging. She smiles, still holding the two discs, she looks toward the third, then raises her arms and drops the discs, they fall to the ground.

2) With determination she steps toward the third disc, stretching her left arm to reach for the disc while clutching a red light in her right hand, she pulls her head back, looking at the lighting grid above, she pulls the SD, and it lowers but does not release its hold.

3) Her intention seems to be to pull it down, she holds onto the bottom of the SD, jumps and pulls it, then she lets it go, she pulls it again and jumps, then she lets go. She then defiantly put her hand through the hole, turns abruptly and walks away to play with something else.

(Extract from the *video data transcript of day 3, session 6.*)

Figure 5-9 Vignette 3 Design and usability

5.3.2 Musical fruit & vegetables

Overview

When the participants entered the installation, they were free to explore the entire space. However, in five out of nine vignettes, the participants chose for their first experience the musical fruits and vegetables. Sitting around the tray promoted shared interaction and the familiarity of fruit and vegetables in conjunction with the novelty of the sound prompted playful interactions with the objects amongst participants.

The sound played an essential role in two aspects – it allowed for playful interaction, often laughter would be heard from the participant's interaction with the musical fruit and vegetables. It also acted as a prompt for imaginative play. For instance, when a participant touched a bunch of beetroot, it triggered the sound of birds, which prompted the performer to suggest to the children that there may be birds in the room and they all set off on an imaginative journey around the room to find them.

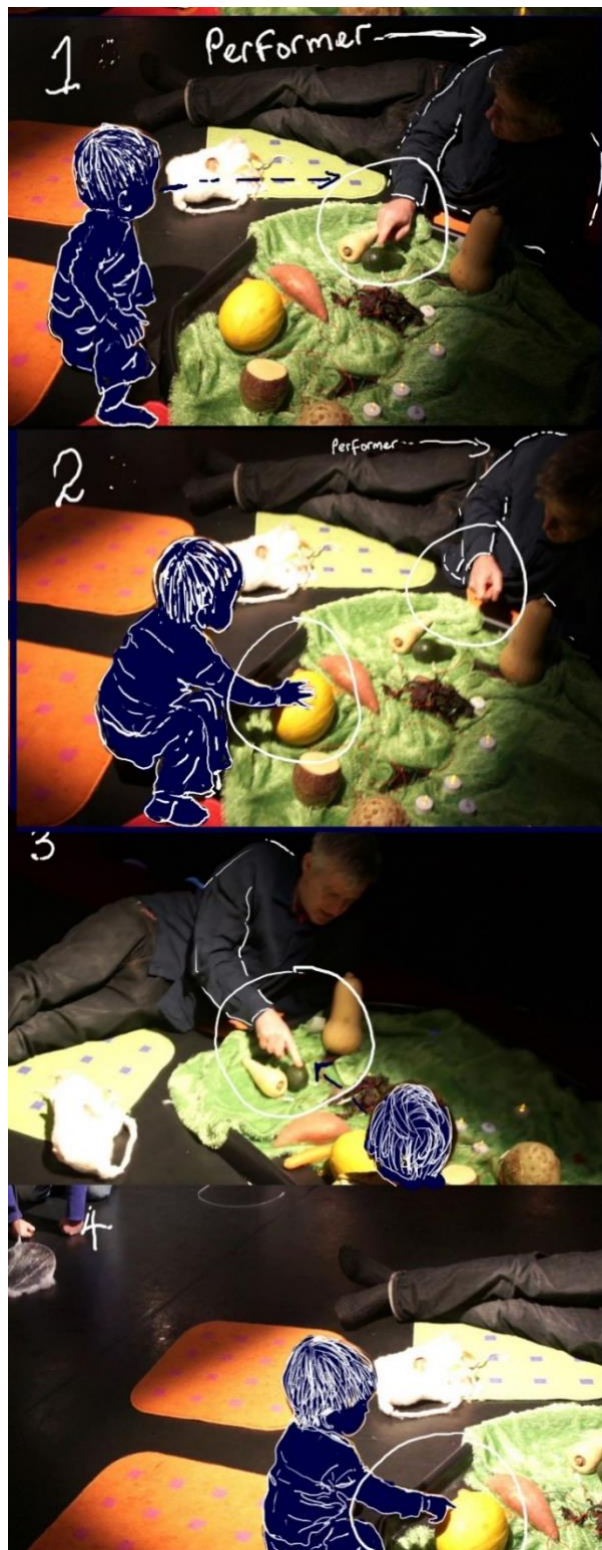
5.3.2.1 Vignette 4 – Sound & communication



Figure 5-10 Vignette Sound and Communication. A young boy approaches the tray with musical fruits and vegetables. The performer is looking at him.

The vignette took place on day three, session seven between a young boy and the performer. The boy's father decides to hide behind one the suspended disc away from his son's direct gaze. One of the performers is standing near the musical fruits and vegetables (Figure 5-10). The boy gazes downwards toward the fruit and vegetables, with his arms at his side he moves a few steps closer to the fruits and vegetables (he has played here with father earlier). He stops in front of the turnip, gazes straight ahead for few seconds, then with his right arm outstretched, he bends down and slaps the turnip. It makes the sound of a train whistle. He stands up again shuffle to his right to get closer to a tray then crouches, and in quick succession, he slaps the celiac three times, and it triggers the sound of a high hat. He kept his hand on the celiac for a few seconds. He gets up moves to his left, bending his knees to crouch down again and slaps a turnip once with his right hand and the sound of a train whistle is heard. He then stands upright shuffles left to the yellow melon and slaps it. The performer lies on the orange coloured mat, and their heads are both at a similar height (Figure 5-11).

When the young boy slaps the melon, it is as if the child is answering the performer's question, and this seems to indicate how very young children can use these sounds to communicate. However, we know he liked the sound of a baby saying 'mama' because he repeatedly activates it. Did he understand what the performer was doing in this vignette, as he repeated it the response twice? This encounter with the performer enriched and augmented his experience from just triggering the sound to possibly situating the sound in imaginative narrative space. In this incident, the young child is seen to be copying the gesture of the performer. At other times it was observed that when a particular sound was triggered, some children would verbally repeat it wherever they were in the room.



1) The performer touches the avocado, the child looks at him; it makes a knocking sound. The performer then touches it again three times with one finger, then with clenched fist knocks it as if it a door and say, 'hello anyone at home?' 'hello anyone at home?'

2) As he moves his hand away, the boy watches him, then slaps the melon and the sound "mama' mama, how' is heard.

3) He looks at the performer as he points and touches the avocado again with one of his fingers.

4) He then touches the melon with one finger.

(Extract from the *video data transcript* of day 3, session 5.)

Figure 5-11 The child imitates the performer's gesture. He starts by touching the fruits with his whole hand then uses one finger like the performer.

Other participants would repeatedly touch a particular fruit or jump on a mat to hear the sound without any utterances, the young child we saw in vignette 4 did both; he came back five times during the 45-minute session to touch a melon which activated the sound ‘mama’ and on one of these occasions he encountered a performer in this short excerpt:

The performer and the child both took turns touching the fruit and vegetables four times before the boy turns around and sees his father then notices something in the tray and reaches for it. It is a small pompom, then turns around and walks off passing his father singing ‘Mama.... Mamaaa Mamaaa’ (Extract from the *video data transcript of day 3, session 5*.)

The excerpts demonstrate the capacity of a very young child to communicate through turn-taking, waiting for a response and imitating gestures and sounds, all the behaviours that allow for active participation in a performance setting. However, if this vignette occurred on a one to one basis in a more structured performance space with more children, then other distractions probably might not occur. Allowing time in performance for these interactions could enrich the audience’s experience. The next vignette reveals how imitation can also occur in a group setting around these same objects.

5.3.2.2 Vignette 5 – Group interaction

The capacitive touch board can only play one sound at a time. Therefore turn-taking needs to be established if the group is to interact. The video evidence demonstrates that many of the young participants were noticeably hesitant to touch the fruit. An adult usually took the initiative to try it. The vocalisation of the actions brought shared moments in a group. For instance, in the first session of the first day of the performance installation, within two minutes of entering the entire group had coordinated themselves around the musical fruit. They had all settled on the circular coloured mats placed on the floor around the tray (see Figure 5.11) and were very close to each other; looking:



Figure 5-12 Group gathering – play with the musical fruit and vegetables

One mother, pointing at the fruit, says ‘Actually, these look like interesting things?’

Child 1 is standing while another is gazing at child 2, holding one of the speakers.

The performer picks up a lemon with her right arm and says: ‘Why have these got wires?’

Child 1 bends down with his right arm outstretched. He touches a fruit.

Child 2 gazes towards his mother, who picked up a fruit that triggered the sound of a bird.

(Extract from the video data transcript of day 1, session 1.)

Once everyone knew what to expect, both the children and adult interaction became more playful. Some would go around the tray to find out the sound of each fruit, others would repeatedly play one particular fruit (Figure 5-12), they sometimes smelt them, and in one case a child started eating the fruit. As they were real objects, some parents use questions such as ‘what is this?’ to help draw a child’s attention. Some children were inquisitive to find out how it worked, and the next section details one of these incidents.

5.3.2.3 Vignette 6 – Curiosity

There were some usability issues in the way the fruit was connected on Day 1, which was rectified for Day 2 and 3. On day one, the wired crocodile clips that were used to connect the fruit to the touch board often got disconnected because children were inclined to pick up and pull the fruit (Figure 5-13). As a result, some of the crocodile clips got disconnected from the fruit and were exposed; there was no danger nor any health and safety issues, just the inconvenience of resetting them. In the second session on Day 1, a child decided to sit in the fruit tray and play. The children in this session were above three years old and they were moving all the scenography around including the grass fabric under the fruit. In the excerpt below, a four-year girl is seating inside the tray with the fruit, she put in the clip into the fruit and pulls it out, but there is no sound.

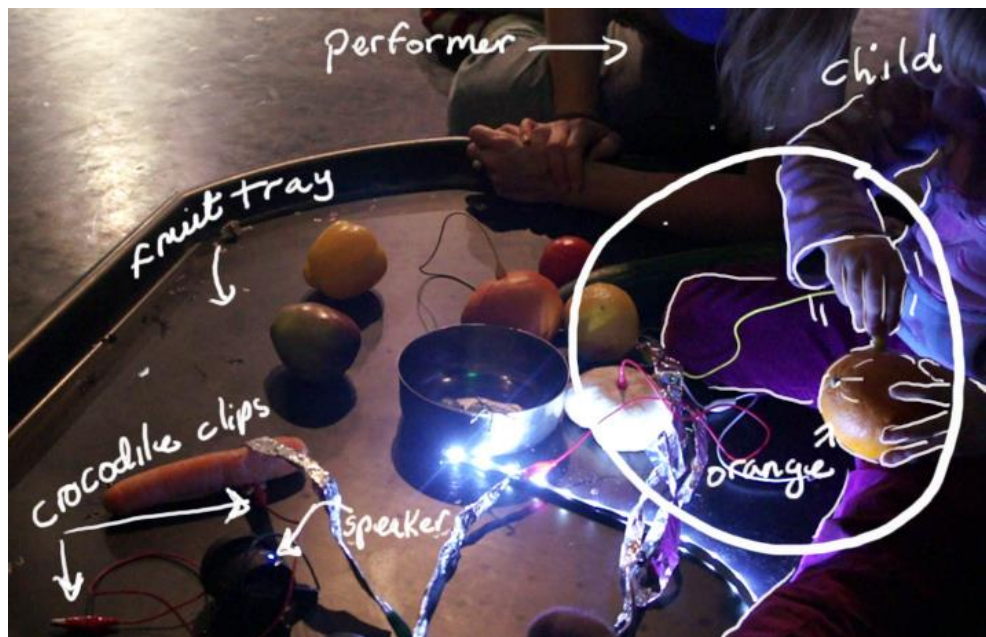
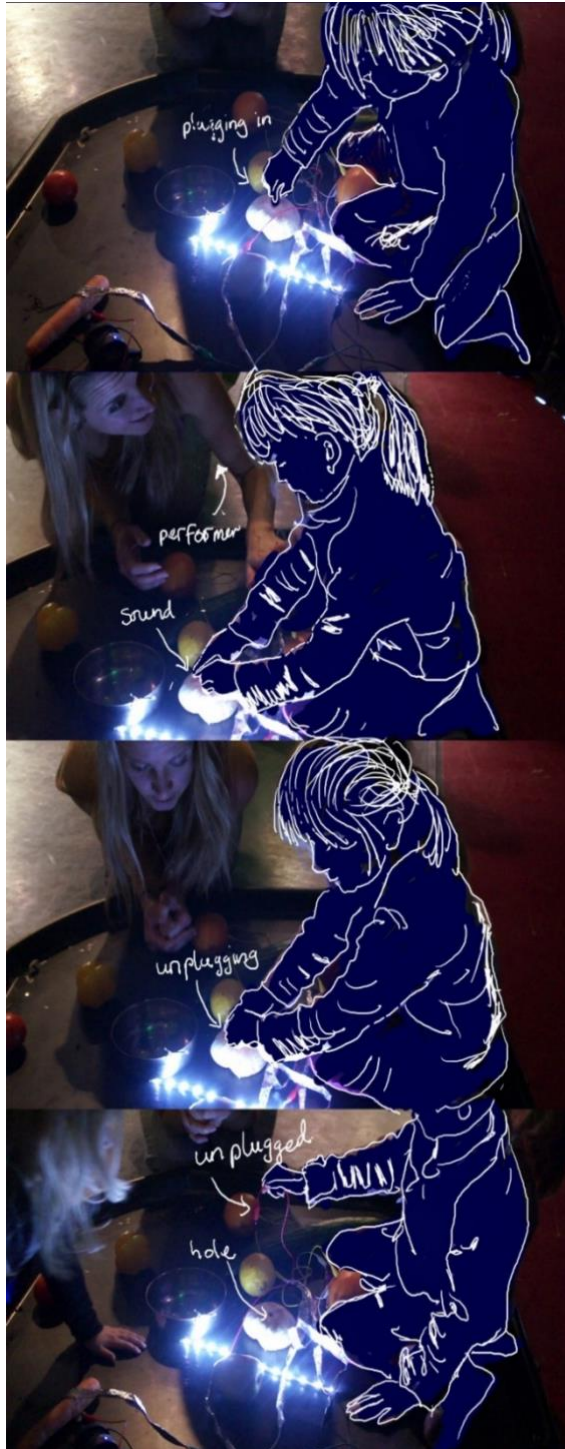


Figure 5-13 The fruits were all connected but lay on the black tray. The child is playing a game of putting the crocodile clips in and out of the fruits and vegetables.

The unpredictability of the sound created a sense of surprise and delight at times, and the exposed clips and foil did not seem to faze them. This occurrence only happened in this session. Three out of the four participants were around the age of

four, and the performer became their playmate. They were all very confident and took total control of the space, rearranged the objects and led the play experience.



1) The performer says, 'You plugged it in and out again, very good'. Then she points to the potato and says 'Ya... do.

2) This one,' 'Ya Ha' says the performer. The girl begins to pull the clip and a sound is activated. The performer smiles touches her right arm and look at her and says 'oh what a lovely sound'.

3) As the girl takes the clip out of the potato, a sound is activated when she attempts to put it back. She then touches the metal area on the clip. It triggers a short, sharp sound.

4) The performer says 'Ooh,' and the girl giggles and performer laughs, she pulls the clip out then pushes it into the potato again (she continues with this activity for some time). (Extract from the *video data transcript* of day 1, session 2.)

Figure 5-14 Plugging the crocodile clips into an orange while the performer looks on

5.3.3 Stepping Stones

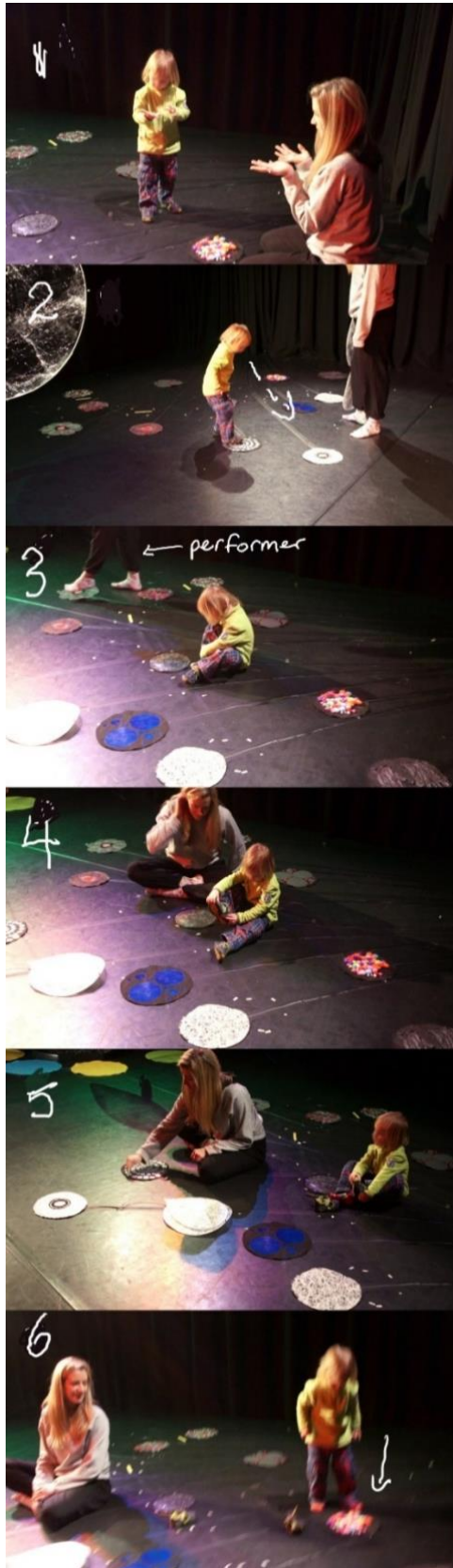
Overview

The stepping stones afforded full-body interaction as well as more intimate experiences with the tactile surfaces. Practical issues such as the position of the speakers seemed to capture a few children's attention, for instance, an 18-month-old boy actively searched and successfully found the hidden speakers behind the black curtains. On the first day, some of the stepping stones were plain black felt, and the children did not use them as they were not visible against the black floor, so on the second study day, I covered them with more tactile materials. The different textured surfaces afforded a variety of tactile experiences and participants often sat and explored them. Many of the children especially liked the pom-poms and the buttons and would spend much time trying to pick them off the mat. The pressure sensor was unreliable with the heavier textured surfaces, with lighter children and with shoes. However, its unreliability became a feature and point of enquiry in the next vignette.

5.3.3.1 Vignette 7 – Looking for sound

A two and half-year-old boy is the only child in the first session on day three. He and the performer were playing with the felted puppets for over 15 minutes. He seems relaxed in her company and knows her by name. They decide to walk through the stepping stone area when the performer walks on a stepping stone. A sound of a piano note is triggered and they both turn in the direction of the sound and look down at a stepping stone and stay in the area to investigate.

The vignette begins with a conversation between boy and the performer. The boy is standing opposite the performer, she has her hands open, Because he cannot make one of the stepping stones trigger the sound, he thinks it has something to do with his hands and performer say to him that he can hit them with his feet (Figure 5-15).



1) Boy: 'What about with your feet' he bashes his feet on the floor. Performer 'Yeah you can do it with your feet,' she gets up and stands 'you can even do it with shoes.'

2) Performer: 'You can if you want'. She stamps her feet on a mat which does not trigger a sound. Boy: 'Noo ehrhh no.' Performer: 'Do you want to take your shoes off?' As she walks around as he bends his upper body downwards looking at his shoes.

3) He sits down, with his right hand on his shoe looking at the performer's feet as she stands next to him only separated by a stepping stone (she is wearing socks).

4) The performer sits next to him. Performer: 'I think that one makes a loud Waah, Waah, Waah sound, I might be wrong, you have to check and let me know' The boy has taken off his right shoe and put it down on the floor. Performer: 'Yeah.'

5) Performer in a loud whisper 'I wish that one worked' as she withdraws her feet and slaps it. The performer taps each of the small metal circles on the mat making a pounding sound.

6) Boy: 'This makes a noise.'

Boy: 'Come on now, play with this pompom.'

Performer: 'Go on then!' He steps on it with his foot, and it triggers the sound of water, and then he repeats his actions. (Extract from the *video data transcript* of day 3, session 1.)

Figure 5-15 Vignette 7 – Looking for sound

The vignettes end after the boy tries trying two other stepping stones that did not work, he became distracted and disinterested in the experience. Yet, again as in earlier discussions about the usability of SD, this failure limited the child's full interaction with this prototype. When the performer steps onto the stepping stone and triggers a sound, it interrupts their play. Using sound in this way is an effective method for a performer to change an audience's direction or led them somewhere different naturally. The child demonstrated sustained engagement and problem-solving in a very logical way, thorough examination and observation by comparing the differences between him and the performer. The performer also supported this well by intervention; asking questions, giving the child room to lead and make decisions. Although some of the mats did not work initially, it sparked curiosity and enquiry in the child, when he took off his shoes, one worked.

5.3.4 Felt objects

Overview

The felted objects and puppets sustained the interest of most of the young participants for short periods. They would pick one up, play with it for a few seconds then drop it and move on to another object. Some of them held it in their hands like a soft comfort toy while doing other tasks. However, when a performer animated them, they held more interest and were actively used in pretend play. Parents who brought along babies sometimes used the felt objects as they were soft and had a long felted string that the babies enjoyed pulling. Although the babies were not an official part of the study, their parents/carers showed them around the environment, and they sometimes interacted with their older siblings and the performers. The wearable LEDs, sensors and conductive threads worked well over the three days and survived being stepped on, thrown and shaken.

Peekaboo is a popular game with young children (under three years old), and it was used to interact with the children during sessions with performers and other adults. In most cases, the suspended discs were used to hide behind. However, in this particular vignette, a very young child played with the performer using the

cardboard suitcase which when opened, the sound-activated sensors triggered vibration on the felt objects and when touched lights were triggered.



Figure 5-16 Participants are looking inside the suitcase as the performer moves it towards them

5.3.4.1 Vignette 8 – Peekaboo

A simple game with an unfamiliar object created child play; the excerpt starts just after the boy sits down next to the cardboard suitcase. The child was playing with his grown-up before this incident, while his sibling was playing with the performer. It was the first time he interacted with the performer alone. The suitcase on the floor caught his attention; it is mobile and quite light in weight and can be carried by this twenty-month-old child. Thirty-seven minutes into the session, the child notices the open suitcase on the floor and lifts it up, and all the things in it fall out, and performer who was next to him helps put everything back in. Then she sat opposite him (Figure 5-17). He opens and closes the suitcase, and the performer puts her face into the suitcases, then moves away and he closes the suitcase. He seemed to be in control of his play. They repeat these actions many times.



1) The performer is sitting on the open side of the box bent over; the very young boy is opposite her. She sniffs the content in the box and says, 'ah nice smell,' and he closes it.

2) Then he says 'Hi!' with a big smile and opens the box, the performer looks in, he closes the box, and the performer knocks the lid and says 'Hello' when he opens it she looks in and says 'Hello, oh ooh, gone' and he closes it...

3) Soon after he turns his body slightly to his right, away from the performer's direct gaze and then opens the box looking forward puts his hands in it and pulls on the felt. The performer turns to him and puts her face into it as he closes the box, she says 'go'.

4) He opens the box again and says 'yahaa' with a wide smile, she says 'ehh nice smell,' and he closes it, and she says 'go'. This continues nine times with the lid opening and shutting at varying speeds...

(Extract from the video data transcript of day 2, session 1.)

Figure 5-17 Vignette 8 a child playing Peekaboo with the performer

The excitement and affirmation in the performer's voice and words seems to create an enthusiasm that was reflected in the child's utterances and broad smiles. The pace of the box opening and closing changed and it created a rhythm and became part of the game, at one point it was so fast that the performer's nose got hit when the young child closed the lid before she had time to get her head out from the box. The repetitive actions of opening and closing of the box lasted for about four minutes before they got distracted with something else.

5.3.4.2 Peter the Puppet – Vignette 9

Vignette 9 involved the felted puppets unlike the suitcase these can be animated like hand puppets. There were five puppets, and they were designed with slight variations. They were used more on day three. The incident occurs while the performer and the young participant were walking in the area with the puppets. They then decided to stay and play in this area. Their play turns into a pretend play scenario where the puppets embodied the characters of the young participant's imagination about a make-believe shop. One 'Peter' had his hair done, and the other 'Peter' bought a packet of crisps. It was the most extended and focused incident of pretend play over the three days (Figure 5-18). At the start of this excerpt, the boy is involved in taking one of the puppets to the shop.



Figure 5-18 The performer took two of the puppets from the small round green mat and began playing with them as if they were having a conversation with each other, while the child looked on.



1) He became the voice of the puppet, the performer operating the puppets refers to them by their name, Peter, but he sometimes interchanges with 'I want' and as the play continued he begins talking directly to the shopkeeper rather than saying 'he wants' through the puppet.

2) The performer responds by addressing him and using his real name. He orders salt and vinegar crisps from the shopkeeper and proceeds to buy crisps for his mummy and then daddy.

3) He runs over to his mother twice, who is sitting near the fruit and vegetables tray. Once he takes the crisps to his mum and the second time, he explains how he paid via his credit card.

4) At one point he and his puppet join the shopkeeper at the back of the shop and then makes the puppets jump up and down on the carded wool in a round wicker tray. It becomes a trampoline, saying 'dong-ing, Dong-ing'.

(Extract from the *video data transcript*)

Figure 5-19 Pretend play with Peter the Puppet

During the encounter the performer allows moments of silence. These moments allow the child to take the initiative as he can make choices about the play or lead the play by suggesting an idea. Perhaps this could lead to more sustained play. The lights were interpreted as the puppet's eyes, so when they lit up, it was awake and when

the lights were off the puppet was asleep. The tilt sensor enabled a more naturalistic and playful interaction than an on and off switch (Figures 5-18 and 5-19). The child's laughter was noticeable during the moments of exaggerated play by the performer. He was also quite comfortable with pretend play and the real and the imaginative worlds collided and are interchangeable during their play.

5.3.5 Survey Results

The short survey aimed to find out what activities the children attending the performance liked playing. The questionnaire comprised of four questions (Appendix 2).

All participants completed the survey before entering the performance installation. The results are categorised according to age groups – one- to four-year-olds (Table 5.3), and in the last column their answers are categorised into four areas: active, role play, making and games. The survey revealed that the majority of children play make-believe and enjoy role play. Only two indicated they did not play make-believe, and they were from the youngest age group. Dressing up and role-playing games seem to be enjoyed by all age groups – some were connected to real work, like hairdressing and doctors, while others related to fantasy players such as princesses and superheroes. What stands out in Table 5-4 is the number of physical activities that children played. Interestingly, making things and the use of construction toys such as Mega Blocks/Lego was indicated in every age group. The final results support the data from current early years research and practice about what children under four do and provide further support that theatre and make-believe are relevant to this age group. Also, the list of activities could prove useful for designing performance.

Participant's age group in years	Gender		Make-believe		What games or activities does your child currently like playing?			
	M	F	Y	N	Active	Roleplay	Making Things	Games/ music
One-year-olds	4	3	5	2	dens, hobby horses, swings, climbing, bicycle, cars, trains, packing bags, putting on hats	dolls, dressing up, princess, tea party, doctors, hospital, princesses, shops, feeding	arts, making things, computer, megaphone, blocks, ring and playdough, colouring balls	animal games, hiding, doing actions to songs
Two-year-olds	5	2	7		loves football, trains, dancing, ballet, singing, reading, tree playing	playing with cooker, cooking for mum and dad, dressing up, superheroes, going on make-believe journey, holiday, work, hairdresser, all kinds of kitchen and home	play dough, drawing, painting, magnets, constructing marble run, paper cutting, sticking, colouring, making things, cards	all things musical, particularly drums and piano
Three-year-olds	1	1	2		small figures, anchor, castle, playing football, cars, balls, balloons, boxes, putting things in bags, swings, wrestling, cars, tractors, ponies, horse	house, dolls, kitchen, spaceships, organising tea party, Hairdressing for dolls and teddy bears, farms animals.	drawing, building things, Legos, colouring, train sets	singing/music, books
Four-year-olds	0	3	3		marbles, balls, trains, cars, transporting things.	make-believe game, with small toy figure, dressing up like a princess, play with big sister and friends, role-playing games.	Colouring, arts, craft, Robots, how things work, find toys, to and out, how batteries work, art.	puzzles, hide and seek.

Table 5-4 Survey results

5.3.6 Play Pattern Framework

Each play pattern represents a naturally occurring behaviour in children that affords the designer a specific way of thinking about and extending ideas for interaction design and physical scenography. The results presented in this study are

encouraging: the play patterns applied to the design were evident in the children's interactions. Additional patterns were observed during the installation that was not considered during the design process (Chapter 4). The play patterns in Table 5-6 are summative and are derived from the data of the participants' actions over the three study days.

Not every child experienced all patterns presented — the opportunities offered by multiple, overlapping play patterns (designed and experienced) may have contributed to the reason for the suspended discs being the most popular scenographic object with the young participants.

The results demonstrate how a combination of patterns that support a logical sequence of actions work well together. The ambiguous form of the suspended discs may be a complementary reason for their popularity. Ambiguity in design seems to free the object and open it up to the participants' imagination, permitting a wider variety of interpretation and interaction (Gaver, Beaver and Benford, 2003). The play pattern framework presents a new approach to design for TEY beyond its original purpose to analyse (rather than design for) the play of children. Using the pattern framework as a creative tool in the design process can extend, create and inspire new ideas and alternative solutions for physical designs and can also help develop and strengthen the interactive design. Mapping the objects and prototypes to the play patterns during the installation established that more play patterns were associated with an object than initially intended through the design. The participants carried, smelled, touched, threw, jumped, hit, head-butted, pulled, dragged, attached, talked to, detached, picked up, examined, moved, wore, carried, tasted, bounced, stepped on, squeezed, drew, swung, pulled and dragged objects over the period of the study (see Table 5-5).

Table 5-5 Play patterns mapped with scenographic objects. Summative data derived from the event log of participants' actions over the three study days.

Scenographic Objects	Play patterns used during the design process	Play patterns observed during the installation	Participant actions, games	Technology
Suspended discs	Rotation Connection Positioning	Rotation Connection, Positioning Enveloping, Enclosure, Transporting, Trajectory	Carried, touched worn as hats, wings, collar. Jump and walk. Use as a mirror, lake, train, for hiding and seek, sticking things on, hitting, head-butting, pull, dragged. Attach/detach.	None
Musical fruit & vegetables	Connection	Connection Positioning Transport	Touch, pick up, examine, move, smell, taste	Touch board (Microcontroller) made the fruit and vegetables into capacitive sensors to trigger a sound when touched
Stepping stones	Trajectory	Trajectory Connection Rotation	Step, walk, jump, touch, pick. Used to sit on, turn	Touch board attached with pressure sensors to trigger sound
Small felt objects/puppets	Transformation	Connecting, Positioning Transporting	Make-believe, carry, smell, touched, thrown, friend, prop, peep a boo game	Wearable sensors and LED lights, Arduino Lilly with wearable LEDs accelerometer. LittleBits kit – sound sensors trigger vibrator and lights
Malleable Objects Gel water beads & play dough	Transformation, Transportation and Connection	Transformation, Positioning, Transporting	Squeeze, throw, step on, touch, drawing	LED finger lights, conductive play dough
Lights object-gloves, LEDs	Transformation transportation and Connection	Transformation, Transporting, Positioning	Squeeze, carried, throw, hide and seek	LEDs
Black stretchy fabric	Enclosure	Enclosure, Enveloping, Transporting	Stretch, pull and drag. Made into a den, swing	No technology

Design for performance always involves limitations and making choices based on aesthetics, space, budgets and scripts, *etc.* Play patterns should not be presumed as fixed criteria; from my hands-on design experience with using them, they are best considered in the early part of the design process. They were used for discovering, refining and extending the original ideas to let in new possibilities. Questioning our original scenographic ideas using the play patterns approach when developing an interactive performance can permit and help the very young audience gain more agency.

In practice, once initial ideas are established, the play patterns can be used to reflect on how they can extend the scenography and interactional design properties. The application stage then involves incorporating the play patterns in the design, then integrating and testing these in rehearsals with the performer and with audiences. The play patterns are a guide and only one aspect to consider within the design phase; consideration for the multisensory affordances, tactile and aesthetic criteria also play a role.

5.4 Reflection

This first study was received well by participants who showed a high level of engagement in the play space. It provided the researcher with a rich source for observation about how the materials are used, the role of organisational setting and the interrelationship of adults and children. Although *Into the Woods* had an open-ended play remit and did not reflect a typical performance environment, with a narrative, it enabled me to have the first-hand experience of how children reacted and interacted with a theatrically lit scenographic space, materials and the performer. Some parents asked about the materials that were used. One person who worked in a special needs school felt that this kind of experience would be well suited for children with special needs.

Study Design

The study was successful, and I was able to achieve the primary goals. However, some aspects could be improved for the next study:

- More effort to recruitment a broader demographic of non-theatre goers
- One more camera in space would allow for better capture of the room.
- Better capturing of parent views and finding out about their children's previous experience of attending a performance.
- Starting the performance in the foyer rather than corridor as it was a bit overcrowded.

More systematic field notes are needed, and reflections on the iterative design process need to be better documented for a more comprehensive overview of the process.

5.4.1 Scenography Affordances

The inclusion of digital and non-digital prototypes proved valuable for a better understanding of the participants' interaction and engagement. It helped me to rethink ways of embedding digital technologies into non-digital objects. For example, the suspended disc prototypes had no digital technology but were the most popular objects; the ambiguous shape seemed to encourage a wide variety of co-creation and make-believe. The design challenge for the next version of the SD prototype would be how to retain the diverse functionality demonstrated by the participants but extend its playability and aesthetics by adding more variables. If an ambiguous object has a function, i.e. adding lights and sensors, the question arises: how would that function change its interaction?

Notwithstanding that the digital components added to SDs, it may enhance the experience and add an element of surprise. Magnetic sensors can trigger LEDs when connecting two or more discs. Moreover, an iteration could be to develop a modular

design to daisy chain several discs; each additional disc could affect the LED in some way, for example, the light levels or colour. The affordance of movement in an object can be a subtle way of calling the users attention. The suspended discs are hung from one point and, like leaves on a tree, they lend themselves to an automatic dynamic movement, referencing techniques used in mobiles. The drawback is that it is not a controlled movement but merely adding a small motor and a proximity sensor to the object would allow for more definitive movements in performance.

The responses from the digital objects were predictable; the objects reacted the same way every time, whether touched or jumped on, and the events lacked a level of randomness. For the next study, I intend to explore more random outcomes and investigate whether it has any effect on playability, engagements and storytelling.

5.4.2 Designing for Storytelling

Using these technologies in a more traditional theatre format with a narrative is the next phase for this research in order to create a convincing case to professional theatremakers and explore whether these technologies can create an alternative hybrid performance with an embedded narrative. The scenographer's knowledge of the audience is an integral part of this process. Understanding the audience's behaviours, performer's relationships and the affordances of interactive technologies is key. The study discussed in this chapter provided a platform for understanding how children respond and play with the performers and how their approach change dependant on the situatedness of the live-action. Moreover, the study exemplified the challenges faced by the performers to keep the children's' attention and negotiate their play experience.

The Audience

The relationship between the performer and child is pivotal when making an interactive performance. Most of the children interacted directly with the performer, but three children stayed with their parents. Despite this, I was surprised by how many children were willing to interact with the performer. Through this study, I

realised the importance of giving the audience time, as each child's confidence level varied. Parental scaffolding plays an essential role in this relationship, and even when children played away from their parents, they were keen to share their experience with them and required parental acknowledgement and reassurance at times.

As mentioned previously, in this experimental phase, the devised nature of this installation/performance was meant to explore open-ended interaction with the young participants and not confine the experience to a fixed narrative. The young participants demonstrated trust in a new situation through their competence and self-confidence, especially when communicating with the performers. Thus, the potential to develop an interactive narrative performance is encouraging. Even some of the youngest participants had a keen sense of observation, for instance, in vignette three, an 18-month-old boy observed and imitated the gesture of the performer when he touched the avocado. One of the purposes of the participant-led experiences was to enable me to observe the young participants intuitive responses to space and scenography and what interested them. By the end of this study, I learnt a great deal about the young audience, their abilities and playful ways of interacting with the scenography and performers.

Interactivity

In the next phase, the aim was to develop an interactive narrative performance. The question that arises is how to maintain the levels of interactivity that was observed in an open-ended play situation within a more controlled environment. What influence would that have on the scenography design decisions?

The next performance should use a theatre format that allows for different levels of interactivity and narrative. In this study, after five to ten minutes in the space, most of the children moved around freely from one experience to another and enjoyed playing with the different elements. Therefore, the theatrical format must allow for audience movement. In a traditional promenade performance, the audience moves and is led to different scenes as the story progresses. Oily Cart uses this format for

performances focus on children over three (Chapter 2), and from the evidence discussed in this chapter many of the children under three demonstrated an ability to observe, repeat and actively engage in imaginative storytelling and playful interaction with a performer. For instance, in vignette 8, the young child spent four minutes with the performer playing the same game. The next step would be to come up with a story idea that suits an interactive style and young audiences.

In general, many of the children enjoyed finding things, playing hide and seek and peekaboo with the performer, so the process of exploring the interactive story could incorporate features of familiar childhood games within the narrative. Recurring actions and events and repetition are features that could be included. We observed some children came back to the same experience time and time again during the session.

In *Into the Woods*, the participants were in effect co-designers of their experience. However, in a more controlled storytelling performance approach, the freedom to act impulsively may be lost. The challenge of the next performance is how to keep open-end playful interactions within a more structured performance environment.

5.5 Conclusion

The discussions and evidence in this chapter illustrate how the experimental performance with children can help a scenographer gain new knowledge of possibilities to create alternative spaces for children. My experience of observing children and their relationship with performers and scenography provided a good foundation for future designs and technology solutions. The evidence from the vignettes and the event log demonstrates the creativity, capability, inquisitive nature of children and their capacity to lead their own experience. Their interactions with the performer shaped their experience and increased the playability of the interactive scenographic objects.

In adopting the play patterns perspective in my scenographic practice departed from my regular design process and, through a cycle of iterative, instinctual processes and the deliberate co-shaping of physical objects with the play patterns, moved towards creating an alternate scenography. The findings demonstrated how technologies could practicality extend the scenography and play experience. The play patterns expanded my design practice and were visible in the actions of the young participants during the performance.

Furthermore, the children's interaction with objects has inspired new ideas for exploring prototypes for scenography. One of the limitations was the unreliability of interactive technologies. This was due to my inexperience and the lack of extensive testing. In the next performance, the interactive scenography will require a more extensive testing period. Despite these issues, the evidence demonstrates children's determination and enquiring nature turned a seemingly ineffective situation into an opportunity to try and make the objects work. Designing interactive spaces for children is a complex process and one that requires understanding your audience behaviours and reconfiguring the space in order to enable their curiosity and desire to interact and play. Adding an underlying narrative as another layer in the design will create added complexity and is one of the subjects of the next chapter.

Chapter 6 DESIGN – THE RUNAWAY HARE

The Runaway Hare performances took place at the Lakeside Arts Centre, Performance Arts Studio in February 2017. This chapter traces and identifies the significant moments in the studio enquiry. I discuss the process of creating the performance: the development of the story, designing and making the scenography and staging the audience. This investigation builds on the design and audience research findings from *Into the Woods* and continues to apply and explore the play pattern design framework and experiment with interactive technology, multisensory and tactile scenography. Also, it addresses the third research question more specifically regarding the relationship of interactive scenography and narrative through the development of an interactive promenade performance. Furthermore, the process reveals how working in parallel with intuitive design, play patterns, multisensory elements and interaction design can play an essential role in developing and enhancing the narrative.

6.1 In Search of a Story

The storytelling has played an essential role in our oral and cultural tradition and this continues today; parents are encouraged to read to their children. Studies have found that children who have stories read to them have a greater awareness of story structure, better language acquisition and more interest in learning and reading (Morrow, 1984). Preliterate children have an understanding of story and plot, and these are evident in many children by the age of two (Egan, 1999; Fox, 2001). However, it is not just about reading stories, but how a story is read that can affect a child's understanding of it (Morrow, 1984; Fox, 2001). Egan emphasises the value of oral culture and how the sound of words, emotional effect, rhyme and the metrical pattern of sound all play a significant part in storytelling (Egan, 1999). In our mediated culture, young children listen and see stories on television, film, and apps.

Many television shows for early years, for instance, in the BBC CBeebies television programmes, the on-screen characters usually address the audiences directly and at times encourage them to follow their actions. In TYA, many of the themes and stories are adapted from popular children's storybooks (Wood and Grant, 1997). Theatre companies have found that familiar stories are more likely to draw audiences. However, theatre for under-threes often develops narratives around familiar themes, instead of fairy tales (Brown, 2012). Including extensive narrative poses a challenge for TEY, in particular with the under-threes (Young and Powers, 2008). A relaxed theatre format allows children more freedom and opportunities to join in.

For this performance, I intended to develop a story that was accessible to toddlers and that invited them to interact with the scenography. The story needed to be familiar to very young children and to link all the spaces. I began by looking at picture books. There is a wide variety of picture books available for all ages, from cloth to peekaboo books; the current trend is towards author-illustrators (Arizpe, 2013). I have long admired the work of writers/illustrators like Herve Tullet, Eric Carle, Oliver Jeffers, Lucy Cousins and Chris Hough. Their books are funny with a visual narrative, elaborate illustration, imaginative stories, animals become anthropomorphic, and children take centre stage. Owing to my previous experiences of text-based theatre, I decided to adapt a children's story. The attempt proved unsuccessful as the script was too abstract and suited older children. I was advised to look at stories such as *Where is the Green Sheep?* which is a popular story with very young children. Inspired by it, I embarked on a mini literature review of 12 picture books recommended for toddlers. After reviewing the stories, and I found that hide and seek adventures were a recurring theme and this resonates with games that very young children play, such as peekaboo and hide and seek and evidence from *Into the Woods*. Secondly, the stories involved characters going on a journey, and this was ideal for exploring in a promenade performance where can the audience take a journey to different scenes. The theme also incorporated play patterns such as transformation, trajectory, positioning and rotation. On reviewing a few of the stories in more detail – *Where is the Green Sheep?*, *Jazzy in the Jungle*, *Where's my Teddy?*, *Lost and found*, *A Bit Lost* –

I found they all follow a similar story structure that includes: a setting (time and place), a journey, the protagonist encountering another character or characters that help to further the story and attain a goal — many featured animals set in an outdoor environment, with sparse narrative and strong visual aesthetic. They require an active reader; questions are often repeated, such as ‘where are you.....?’ giving the readers a chance to get involved by searching for the character on the page, some have physical interactivity such as flaps and peepholes, all end with the goal fulfilled. Some like *A Bit Lost* ends with a twist. I considered using a similar story structure as it may feel familiar to the younger audiences and adapt to a promenade theatre format well; the viewer can physically move between different scenes, like turning a page in a book. These findings became a guide and provided a starting point to develop the storyline, setting and characters for the performance. The stories have very little text, and I recognised the need to look beyond the standard text and perhaps towards a devised approach with the performer, which seems better suited for the process. Looking for a protagonist for the seek adventure is discussed next.

The Protagonist

Animals are often the main protagonist in young children’s stories. Children tend to prefer animal stories (Franz, 196, p. 35). They are also familiar with animal stories as many children’s storybooks use animals with human qualities, from Peter Rabbit to Winnie the Pooh. Since the 1840s, there have been anthropomorphic characters in European children’s literature. *Struwwelpeter* by Heinrich Hoffmann was one of the first printed series of silly, exaggerated stories and funny illustration (Burke and Copenhaver, 2004). I decided to use a hare because of its long history in folklore and prevalence in children’s fiction, for example, the Aesop tale *The Tortoise and the Hare* and more recently Sam McBratney’s *Guess How much I Love You?* Using a hare as a character also made logical sense for a ‘hide and seek’ story – because of its long hind legs it is a fast runner, and another distinct feature is its long ears which could display the character’s emotions. After consulting the performer and the creative team, we agreed that the final story would be a hide and seek adventure called *The Runaway Hare*, discussed next.

The Runaway Hare Story

The Runaway Hare is based on the theme of a hide and seek adventure. The story begins with children who are invited to play with a Hare and his friend. But they discover Hare is playing a game of hide and seek with them. Thus, they join his friend on an adventure in search of him. The following is a summary of the story that was devised.

Once upon a time Sophie and her friend, a grey long-eared hare, invited some children and their grown-ups to come and play at the theatre by the Lake. But, on arrival, they found out hare was asleep in his little red suitcase. Sophie decided to wake him up, but when she opened the suitcase, he had vanished. Where could he be? She checked the room but could not find him there. So, she invited the children to join her on an adventure to see him. They visit all his favourite places – the magic tree, the musical meadow, the shadow dome, and finally they found him hidden inside the giant flower. What a cheeky hare! He played with the children, and finally, he began to feel sleepy, so the children tucked him into his bed in the red suitcase and bid him goodbye and went home.

The development of the story was not a linear process, and it was refined throughout the design process. Its included at this point in the chapter as it helps to contextualise the design and interaction choices made during the design process in Section 6.2. In the next section, I discuss the design of the audience experience, scenography and interactions and how they to support the story.

Scenography Design Phase

The scenography developed through the exploration of materials and the overarching themes; the ideas are processed through multiple lenses – the play pattern design framework, technology, story and the sensorial. In parallel, I kept an open mind for discoveries and surprises. This approach allows for creative recombination and novel solutions through trial and error along the way. The deliberate combination of the seemingly unrelated ideas can produce new insights

or inventions (Koestler, 1964 quoted in Amabile, 1996, p. 20). How the new comes into being. One natural question often raised is:

How do we ever get new verbal creation such as a poem or brilliant essay? The answer is that we get them by manipulating words, shifting them about until a new pattern is hit upon. (Watson, 1928, quoted in Amabile, 1996, p. 20).

It is this shifting that Watson refers to, that the designer does by intentionally moving back and forth from the practical to the serendipitous in studio enquiry. Together with using the play patterns framework, I took notice of unexpected accidents. I allowed them to inform the design and performance, but also to assess their value under the specific lens. The design emerges in this hybrid environment, and working this way permits the most direct access to think about audience needs as well drawing on my tacit design knowledge. The moment where the material takes a form can happen at any point in the design process and with one or multiple lenses. However, it is not always easy to assess there is tension as altering and refining the design relative to the aesthetic, form and functionality is essential. As well as meeting the constraint such as budget, venue and materials. The aim is to make scenography that is aesthetically pleasing and contributes to the narrative. Scenography that is playful and interactive for audiences helps to get some way into answering the research first question *how can scenography be made interactive using digital and tangible technologies in theatre for early years?*

The design and making process also benefited from by the physical working environment as unlike *Into the Woods*, *The Runaway Hare* studio enquiry took place at the Mixed Reality Lab (MRL). The research benefited from not only having adequate space but an established community of HCI practitioners. Being in the laboratory environment facilitated knowledge sharing, ad hoc meetings and conversations with researchers. It was beneficial, especially for getting advice on technological aspects, for instance, making hardware elements more suited for public use and daily troubleshooting issues.

The initial ideas were developed through sketches (Figure 6-2) they acted as a generative tool within the ideation process to help communicate the design idea quite early on in the process; this ran in parallel with devising story. Improvising the story meant that the performer could become actively involved in the narrative, thus making it her own. The story ideas develop more organically alongside the design. The next section outlines the development of the scenography and the performance.

The design phase included continuing to develop the narrative, sketching designs, consultation on the design ideas of the creative team and creative technologist, prototype building, testing and redesign (using the play pattern framework) and devising the narrative.

Collaboration

Collaboration is standard in theatre practice; in this project, it was limited to the same small creative team from *Into the Woods* (Sean Myatt – object theatre artist, Sophie Johnson-Hill – performer, and Rachel Feneley – the Learning Officer at Nottingham Lakeside Arts). Their role was to advise and help shape the performance and integrate the story. Working with a creative team is part of a scenographer's job, but in this project, I was the auteur and director of the performance. The discussions and rehearsals took place in the Mixed Reality Laboratory studio space and the Lakeside Arts. Three rehearsals took place with the performer. Most performances have more extensive rehearsal periods; however, as this was a devised piece with a relatively short and straightforward story, three days were sufficient. In interactive, participatory performance, the audience is in flux, and this requires the performer to reassess her actions in real-time.

The first rehearsal took place in October 2016 after the development of a few scenographic pieces; this enabled the performer to play with the different prototypes to facilitate the ongoing devising process. In the sessions, we discussed ideas around the story development and how the objects can be integrated into the performance allowing for the early mapping of the interaction between the objects, performer and the story. In the second rehearsal session, Sophie suggested she could write a few

short songs for each scene. She wrote three different songs that were repeated throughout the performance. In her experience working with children, a song is an effective way of captivating them and drawing them back to the action. Trevarthen found that songs and music can create an effect on very young children (Trevarthen, 2002).

Structure vs Agency

Looking back and reflecting on the design process, ideas were evaluated and negotiated with the creative team; however, there were some disagreements during the collaboration. In particular, the performers were concerned that with the addition of a more structured narrative, the open-ended, child-led play aspects of *Into the Woods* could be lost. They were worried that a more structured format could create tension between freedom to play and the narrative, especially due to the variance in the physical and cognitive ability of the young audience. An 18-month-old child's behaviour and interest are quite different from a 36-month-old child's. Nevertheless, if we think about the relationship of structure and agency not as opposing each other but as one that works together, Giddens refers to the concept of 'duality of structure' as one where the structure and agency are dependent. In this relationship, knowledge becomes the foundation by which the agents (audience) understand and modifies the rules (Giddens, 1979). Considering theatre as a social institution with its own rules or structure, different theatre formats will have different levels of audience agency/interacting. In some cases, like a pantomime, the audience can exert their agency at fixed times in the performance. Verbal communication with the actors is encouraged as opposed to discouraged in a traditional play. For an interactive promenade performance, the rules of engagement are clear – a must is that the children are in charge and free to move anywhere in the space, and this is clearly explained and agreed to by parents. Can this give the young audience authority to exercise their agency? Would this disrupt the other audience members?

The first study produces a situation that is uncommon in the theatre where the audience had a great deal of freedom. In considering the team's concerns, I concluded that there was more value in experimenting with an interactive narrative and acknowledging the limitations. Finding new strategies to make the performance work. It is in this situation where May concludes 'Creativity arises out of the tension between spontaneity and limitations, the latter (like the river banks) forcing the spontaneity into the various forms which are essential to the work of art or poem' (May, 1975, p. 115). How can the limitation in performance be creative?

The combination of storytelling and interactive play is the cornerstone of this performance and research, finding ways to do this will be a matter of trial and error – using techniques from TEY professionals as well as the performers own experience. Children will bring with them their own play experience, as data showed in *Into the Woods*. The performance could be a type of co-creation, where the actor works alongside the young audience, within the story structure (Prendiville and Toye, 2000, p. 9). The challenge is not only in finding the right balance but for the performer to know when to facilitate and when to perform. However, the previous study demonstrated that there are benefits to a full child-led experience. Consequently, I added 20–25 minutes open-ended play scene after the hare is discovered.

The Performance Space

The Runaway Hare scenography was designed and constructed over six months between June and December 2016. With the hide and seek theme in place, the first design iterations were developed through a series of sketches (see Figure 6-1).

Taking the role of the scenographer, interaction designer and director on this project allowed a higher level of artistic freedom than usual but was challenging at times. Being open to devising the performance alongside actively making the scenography and the technical elements was stimulating. A flexible and experimental methodology discussed in Chapter 3 was adopted. At the start of the project, the sketches helped my collaborators to visualise the scope of the project.

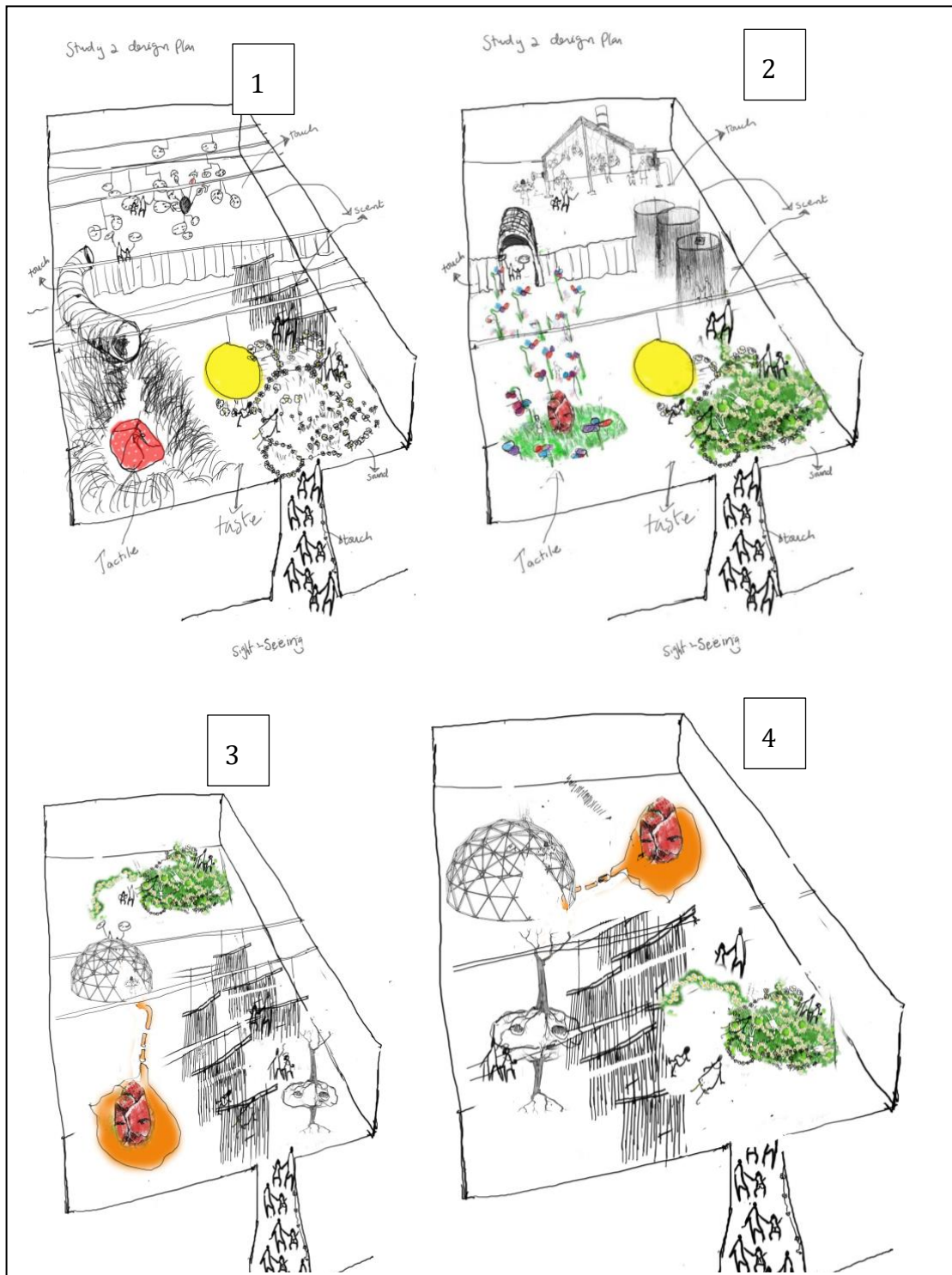


Figure 6-1 Sketches of performance design, over a six month period. Illustration number 4 is the final design.

The designs were developed over time, and the scenography became more minimal and open plan, as seen in Figure 6-1. There were no hard divisions or uninterrupted scenery between the areas. The lighting design created a soft division between each scene. Editing the design became as much about being pragmatic as intensifying the audience focus on the main interactive scenography.

6.1.1 Thinking Through Making

Like most design processes, this one was messy, and the final designs were as a result of the influence of others, through the act of making and the limitations of time and budget. Designing and building with an open-mindedness allow for serendipitous happenings and accidents that eventually shape the end product. In regular scenographic practice, the shaping of the design usually occurs in the scale model phase. Here is where the iterative work often lies, in altering the design until the desired result is achieved. However, my design process moves from the sketches to making scenography. Undertaking making all the scenography was new to me. I have previously made only small props. Most scenographers rely on skilled craft makers to make the stage sets. Creating and thinking go hand in hand. This 'hands-on', intimate and tactile relationship with scenography meant I became immersed in the material and its qualities which became part of the solution.

The process facilitated the act of simultaneously designing and implementing. The large-scale experimentation has strengthened my relationship with the materiality and the physicality of the design object. Looking at the scenographic objects at a distance and then intimately manipulating the material and testing them with each other. Making and thinking goes hand in hand my studio practice revealed a constant shifting from the sketch to the full scale and back again. This way of working is not unique, although it is uncommon for scenographers. Architects such as Renzo Piano have worked in this way for some time (Sennett, 2009, p. 9). However, this is more complex and a difficult way of working and could prove to be problematic on larger scale projects.

As with *Into the Woods*, the play patterns were implemented in the design studio and used to extend and enhance the scenographic objects. Initially, I choose one play pattern for each object and as the design progressed the affordances for other patterns emerged (see Table 6-1).

The Scenography	Play Patterns
The Red Suitcase	Connection, Enclosure
The Magic Tree	Transformation, Connection, Enclosure
The Music Meadow	Positioning, Orientation, Trajectory
The Shadow Dome	Enclosure, Rotation, Transformation
The Giant Flower	Rotation, Transportation, Enclosure

Table 6-1 The scenographic object and the associated play patterns

The play patterns were considered for both physical and digital interactive design elements. For instance, in the magic tree, the transformation play pattern is connected to the light changing, which is an interactive digital element. All the play patterns in the framework were used, and some overlapped, as seen in table 6-1. An account of how the play patterns are implemented in each of the objects is discussed in Section 6.4.

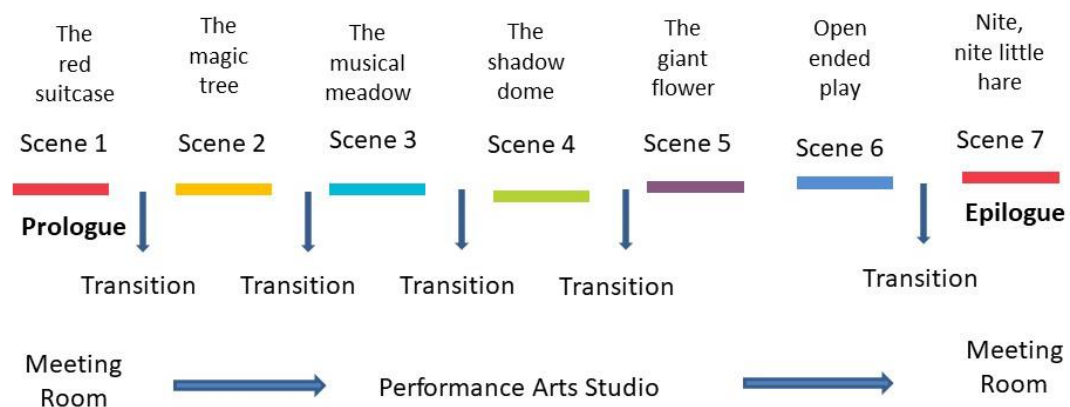
Inspiration

The Runaway Hare, like *Into the Woods*, used the natural outdoor environment as its design inspiration. The design concentrated on objects that are familiar to children such as trees, flowers and meadows. It made associative connections to play pattern framework, interactive technologies and multisensory materials to further develop the scenography. The design focuses on interactive scenography and placing the audience in the middle of the action. The scenography is not only intended to be interactive but to help move the narrative ahead. In interactive theatre, the scenography is viewed up close, so it needs to look good as well as be able to function

and be handled by very young children (Brown, 2012, p. 31). The choice to use the entire space is, in part, influenced ‘environmental theatre’ and the interactive work of Oily Cart. Schechner suggests that there is a living relationship between the space and the body of the performer and the audience. When there are no barriers between the performer and the audience, the audience can better feel the space, and it becomes a ‘haptic’ space (Schechner, 2013, p. 385). The notion of the ‘haptic’ space is particularly relevant to the process of designing a space for TEY, where the audience is actively participating and able to touch and interact with everything. From the beginning of the design process, the project was closely tied to notions from environmental theatre and interaction design, therefore, it was necessary to consider outside the central performance space, as part of the whole theatrical experience.

6.2 Staging the Audience

There are seven scenes in *The Runaway Hare*, scenes 1 and 7 takes place in the meeting room next to the Performing Arts Studio (PAS) while scenes 2 to 6 takes place in PAS (Figure 6-2).



* **Transitions** are the journey between each scene that helps to focus the audience attention

Figure 6-2 The audience journey

The first and last scenes became the prologue and epilogue of the performance, and the foyer between the two rooms was a transitional space. The latter effectively filled a gap at the start and end of the experience. They played an important role in 1) introducing the audience to the actress and the story in non-theatrical space, and 2) facilitating moving the audience out of the central performance studio space at the end. The latter proved to be a successful technique for most of the children; only a few were reluctant to leave the performance space. This method of staging the audience ‘in and out’ of experience, have been used in performances by Oily Cart Theatre with significant effect. Other theatre companies like Magic Adventure Theatre and Ito sing the audience into and out of the theatrical space. Incorporating a welcome scene at the start and goodbye scene at the end in performance is a necessary and significant part of engaging and easing a TEY audience into the performance experience. It helps children relax, especially in an unfamiliar environment and when it is the child’s first experience of a performance. Different pathways such as grass, mirror foil and grey tape lined the spaces in-between each scene to keep the audience interested in the journey and connect to the performance. These spaces became the transitional points between each scene.

In the next section, I will discuss the design inspirations and process for each of these spaces in more detail and outline the role of the play patterns, technology and multisensory elements.

6.3 The Scenography

Five main scenographic areas were designed and fitted around the story (see Figures 6-1 and 6-2). The scenographic objects are presented in the order they occur in the story rather than when they were designed.

6.3.1 The Red Suitcase

The red suitcase is the first prop the audience encounter in the meeting room. The meeting room is next to the Performance Arts Studio (Figure 6-2) at Lakeside Arts.

The meeting room furniture was moved from the middle to the side, so there was space for children to move around or sit on the floor.

The 1950s suitcase was the hare's bed. Inside the suitcase was a miniature model of the studio performance area (see Figure 6-3). The purpose of the model was to help the children and their grown-ups get familiarised with performance space and the narrative. Direct reading activity (DRA) methods with children who cannot read yet can help them better understand the story (Morrow, 1984). DRA is where the storyteller takes an active role by posing questions and a discussion before and after reading a storybook, these act as 'advanced organisers' (Morrow, 1984).



Figure 6-3 The Red Suitcase with all its contents

We adapted this idea visually through the scale model of the space, the model props in the red suitcase acted like the 'advance organisers.' Tim Webb, the former director of Oily Cart, refers to the importance of empowering children (Brown, 2012, p. 85). The aim was to familiarise the children with story, materials and objects before they encountered them. We hope this would help them know what is to come and where they were going and help to empower them.

Play Patterns: Enclosure and connection were the play patterns used in connection with the suitcase. The scale models helped the participants connect to the larger objects in the installation beforehand. Polaroid images (Figure 6-4) of Sophie and Hare on different adventures in Nottingham was stuck on the inside of the suitcase cover (Figure 6-3). The aim was to try and connect the children to familiar places where the Hare likes to play and show them what he looks like. The suitcase is an enclosed space and where Hare sleeps and keeps his favourite objects. When the lid has closed a sense of anticipation and intrigue is created about what is hidden or enclosed inside.

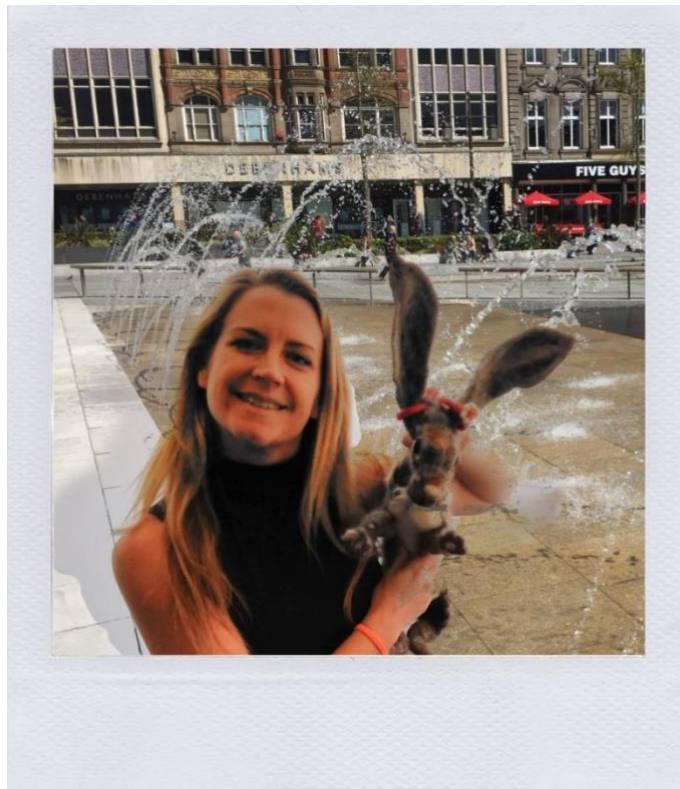


Figure 6-4 Polaroid of Sophie and the hare at the fountains in the Old Market Square, Nottingham City Centre.

Multisensory Materials: The children could handle all the objects – the boat, tree, butterfly, flower and grass inside the suitcase. The performer's task was to encourage the children to touch and play with them. The Jungle Berry small felted flower, in the

suitcase, was scented. Songs were used to move the story along and engage the children. When Sophie found the butterfly, she animated it and sung:

Butterfly, Butterfly

Floating gently through the sky,

I can see you here and there

Whispering, fluttering everywhere

Butterfly, Butterfly

Floating gently through the sky.

6.3.2 The Magic Tree

The magic tree is embedded with lights that are activated by sound. The initial ideas for the tree began in October 2015 with an opportunity from Lakeside Arts to add a few digital interactive elements to their *Neverland* Christmas installation in the Weston Gallery. The brief was open, and I worked alongside their installation artist. The opportunity provided a space to test initial interactive technology ideas over five weeks in the wild. I explored the way of extending the current installation design to create playful interactions.

The idea was inspired by a wearable tutorial from the Adafruit website where the sound is used to activate lights. This idea was scaled up and included a string of 60 lights which was put around the tree in the centre of the installation. The tree was made from a wooden frame and clad with papier mâché, and strips of cloth hung from its branches. A string of neopixel LEDs was wrapped onto the branches. Inside the tree housed the microphones to capture voices and microprocessor boards running the LEDs. Over the five weeks, the hardware installed proved very reliable. However, some usability issues were encountered; some children did not make the connection between the lights and their voices. Perhaps, the LEDs were not bright enough and were too high in the tree. It was a pragmatic decision as the installation was

unsupervised during the six weeks. Secondly, the strips of cloth hanging down the tree made it difficult to see when some of the lights were activated.

The experience initiate thoughts about the relationship between scenography aesthetics and interaction design. Designing interactive scenography is about the



Figure 6-5 The magic tree with lights, funnels and feathers

interplay of these two aspects and how they define the ontology of an object. The tree did not feature in the original design, pre-October 2016, as seen in Figure 6.1. Sometimes in the design process ideas naturally occur and at other times they need time for incubation. The experience of the Neverland Installation demonstrated how using sound to trigger lights was an opportunity for a fun experience. Using a tree seemed like the right solution, children recognise it, and it fits into the story. However, during the early

stages of the design process, making a tree

seemed inconceivable, so the idea was put on hold. By October 2016 while reflecting on materials used in *Into the Woods*, I recalled the work of *Numen*, an artist collective that uses tape for a large-scale installation.

Combining the plastic wrap and tape created an opaque skin that when illuminated, created a unique glass-like aesthetic. It was the ideal material for making the tree. To make the tree I moulded the tape around cardboard tubes to make small or large cylindrical shapes for making the branches and the trunk. I discovered it is flexible and can be bent and seamlessly join (Figure 6-5). The tree is two metres tall with exposed roots that ‘grow’ around a rock made with the same material – the design developed through the process of making it. The main challenge was the instability of the taped objects as without an internal framework, the cylindrical trunk collapsed. A wooden base was installed to support the rock, and the flexible duct pipes went some way in helping the structure to hold itself, but they were not enough. In this end, to keep the tree upright, the branches suspended from theatre lighting bars on the ceiling of the performance studio.



Figure 6-6 The magic tree and the associated technologies

Interactive Technology: The sound-activated lights used in the *Neverland* installation were tested in the magic tree. They were not bright enough, so they were replaced with two 60 neopixel LED stripes with two Flora microcontroller boards and microphones to capture sound (see Figure 6-6). These were installed inside the tree trunk. The opaque plastic kitchen funnels attached to transparent tubes were

used to help capture the participant's voices (see Figure 6-7) that activated the lights inside the tree trunk.



Figure 6-7 The performer singing to the tree

They looked like branches growing out of the trunk. The LEDs enhanced the layers of translucent materials, making it radiant and glowing to create a magical atmosphere.

Compared to *Into the Woods*, I felt more confident to experiment with different technologies. More time was allocated to make the technologies stable and the requirements for a small touring performance were considered. For instance, 3D printed cases were built to protect the microcontrollers, and detachable connectors enabled the LED light strips to be removed for storage and transportation. This practical approach helped me to reflect on the requirements of open source hardware in a real-world touring situation.

Play Patterns: The main play pattern associated with the tree is transformation; the participant's voice or sound activated the coloured lights inside the tree trunk and changed them. In this case, digital technologies created affordances for the transformation play pattern. The additional features in the tree offered more choices and opportunities to engage with the scenography and narrative. In the findings from the first study, children demonstrated the concealing play pattern by playing hide and seek with objects. Influenced by this, several holes were cut out of the rock under the tree. Some contained concave mirrored shaped discs that distort/transform

reflections and others were filled with purple feathers that were hidden in the ducts under the tree.



Figure 6-8 Multisensory play with the feathers and funnels in the performance studio

Multisensory Materials: This experience of the tree was focus on the visual sense. Together with the changing lights in the tree, the soft feathers were released above the children's heads by the performer and floated down to the floor to create a visual feast. The noisy origami cellophane butterflies, with magnets on their bodies, were dispersed on the tree trunk and branches. The final design resulted in a rich multisensory experience for the participants. To reconnect the children to the story and demonstrates how the lights were activated, Sophie sang the hello tree song into the funnels.

Hello Tree, do you know, which way I should go, go, go?

I want to find my hare,

I can't see him anyway.

(repeat)

6.3.3 The Musical Meadow

The musical meadow is the second iteration of the original stepping stones used in *Into the Woods*. The aim was to design a whole-body experience and experiment with how the sounds can connect participants within a group experience. Similar to the musical fruit and vegetable experience from *Into the Woods*.



Figure 6-9 The musical meadow design sketch

The meadow was designed to be a collaborative musical experience where the participants used their bodies to produce sounds through walking, jumping, rolling or touching. My design research was inspired by land artists, in particularly Andy Goldsworthy, who uses intricate patterns made from found natural materials. The meadow design references the wild daisies growing on the grass around Lakeside Arts building. Daisies are so common that many children will be familiar with them.

The fabrication of the meadow entailed crafting two deep pile bright green rugs. The long carpet pile made it easy to join them seamlessly. The material was durable and soft enough for crawling children. The carpet piles were painted with dark green and yellow non-toxic fabric paint, to give the piece a more grass-like quality. Beyond that, it was a matter of shaping, cutting and shaving to achieve a more organic look. The

two rugs were joined and cut into an oval shape. A narrow-curved pathway was sculptured into the middle, and the long pile was cut at different lengths to create an uneven surface (Figures 6-9, 6-10). The daisies were made from white and yellow wool using the wet felt method and were stitched onto the surface in a circular pattern to indicate the position of the sensor.



Figure 6-10 The mounds surrounded by felt daisies and the hare

Mounds were made using carded wool and cushion fillers in the layer between the sensors and the bottom of the rug. The smaller rug pieces became the pathways on the approach to and from the musical meadow. These pathways defined the spaces and provided continuous flowing action between each scene. The movement between the scene is essential to consider, so the audience felt they were always in the story. Attention to detail throughout the design process is vital. The time invested in carefully working on the quality ensured that the rug and other scenographic objects were more finished and professional. Too often from my experience, scenography quality falls short in children's theatre. The added features and details enhanced the design. They made it more distinct, and even though it was 'not real

grass' the material and aesthetic qualities contributed to its strong character, more significant fun factor and potentially permitted more choices and play situations.

Interactive Technology: The technology was designed and developed in parallel with the scenography. At the start, I was keen to make a reliable system that is flexible and reusable. The force sensor mat started with an investigation into different types of force sensors. The budget constraints effectively led to two options to make a fabric sensor or purchase a commercially-available one, and both were tested.



Figure 6-11 Fabric handmade sensors prototype design

The large textile force sensor using *velostat* sandwiched between conductive materials (Figure 6-11), a technique, found on *How to get what you want* a longstanding research website for DIY wearables (Kobakant). The final fabric sensor (Figure 6-8) was successful in triggering the sound. Still, it was not as reliable or sensitive to different types of interaction, for instance, the commercial sensor proved more efficient at activating the sound with physical interaction when touching and playing with the rug pile and lightly walking on it. The level of sensitivity was the deciding factor in using the commercially available sensor.

In the previous study, the children's weight affected the force exerted on the hand-built foil sensor; if they were too light, it did not work. The main disadvantage of the commercial sensor is that it is small and only covers a limited area. Still, it was sensitive to the lightest touch, so the audience identification of the sensor coverage is essential. As a result, over the interactive areas, rings of the daisies and mounds were designed to create visually distinct and recognisable areas on the mat.

The scenography and technical interactive aspects were developed in parallel. Given the size of the rug and participant numbers, eight sensors were used to trigger sounds.



Figure 6-12 The musical meadow force sensors mat and microcontroller Wav Trigger

Four different types of Arduino compatible microcontrollers were identified and tested. The features are recorded in Table 6-2. The boards were all are capable of running sound and have the capacity for the eight sensors. However, only the Wav Trigger had a polyphonic feature where more than one sound can be triggered simultaneously, which is suitable for group activities. Also, it is multi-channel and allows for multiple sounds on each. It has a free and user-friendly software programme that requires no coding but provides for several programable features,

for instance, changing the order of the sounds, sounds can be played randomly, paused or at different volume levels

Microcontrollers (under £60)	Poly- phonic sound	Multiple channels	Sensor	Storage memory	Level of difficulty	Software	Technical
Touch Board Bare Conductive	No	No	12	SD card	Beginner	Optional	None
Audio FX mini Adafruit	No	Yes	12	16 MB	Inter- mediate	Optional	Soldering
Wav Trigger- Spark Fun	Yes	Yes	16	SD Card	Inter- mediate	Yes	Soldering
Raspberry Pi	Yes	Yes	Yes	SD Card	Experience	Yes	Soldering

Table 6-2 Various microprocessors and their affordances and features

Play Pattern: Like the stepping stones in *Into the Woods* the trajectory play pattern was considered, in particular, to extend the whole-bodied interaction to include, jumping up and down, rolling, moving in a circle, back and forth, so the audience uses their physical body to trigger the sounds. However, also relevant is transformation and connection play patterns. The sound of the hare's voice asking questions is included to try and make a connection with the character and the story.

Multisensory Materials: Sound was the overarching sensor experience design for this area. In addition to the sounds that were activated by jumping on the mat, popular songs like *row, row, row the performer sang your boat* as it was familiar to most children.

Like in the previous scene, the performer wrote a song:

Hello boats

Do you know where I should go, go, go

I want to find my Hare

I can't see him anywhere

The grass meadow sound design was developed in collaboration with two researchers in the MRL lab who specialise in sound design and engineering. They helped to programme the soundboard, record the sounds and design the sound effects. The findings from the first study revealed on several occasions; children went looking for the source of the sound. They realised that the sound effects were not coming from the stepping stones and went behind the drapes to find the speaker. Therefore, for the meadow, we localised the sounds by using two speakers placed on the floor on either side of the meadow, and the right speaker played the sounds triggered on the right and left likewise. The sound effects were programmed to be played randomly, to create a more natural experience. A mixture of animals and nature sounds were used, such as birds and water and the voice of the hare asking questions such as ‘Can you find me?’ The intention is for the sound to suggest the presence of the hare. It is as if he left messages for them in the meadow.



Figure 6-13 The small 3D printed boats with roller switches attached to the bottom

Like with the tree small props were added to the experience, 3D printed boats (Figure 6-13) that light when children pushed along the pathway, daisy armbands with magnet clasp lit up when touched to the performer's armband and soft felted rock with a hidden message from the hare to read out by the performer. The aim was to add objects for hands-on play and to link the narrative.

6.3.4 The Shadow Dome



Figure 6-14 The shadow dome at the Performance Arts studio

The shadow dome is an enclosed space in contrast to the open meadow environment (Figure 6-14). The dome surface was inspired by children's den making and used different types of materials to cover the wooden frame. The dome is essentially a geosphere made from a commercially-available system that uses connectors attached to wooden sticks or PVC pipes. For the shadow dome broomsticks were used (Figure 6-15). The system is quick and easy to install, so perfect for a touring theatre. On the inside of the dome cellophane butterflies and the discs from the first study were attached with magnets. The intention was to make the discs into butterfly wings that lit up for children to wear; the idea was inspired by how children used the discs in the first study. However, making the design child-friendly became complicated, and consequently, it was not completed in time. By the time the

situation was re-evaluated in November 2016, the narrative had further developed, and the hare was the main protagonist, so there was an opportunity for a direct link to the story through shadow puppetry.

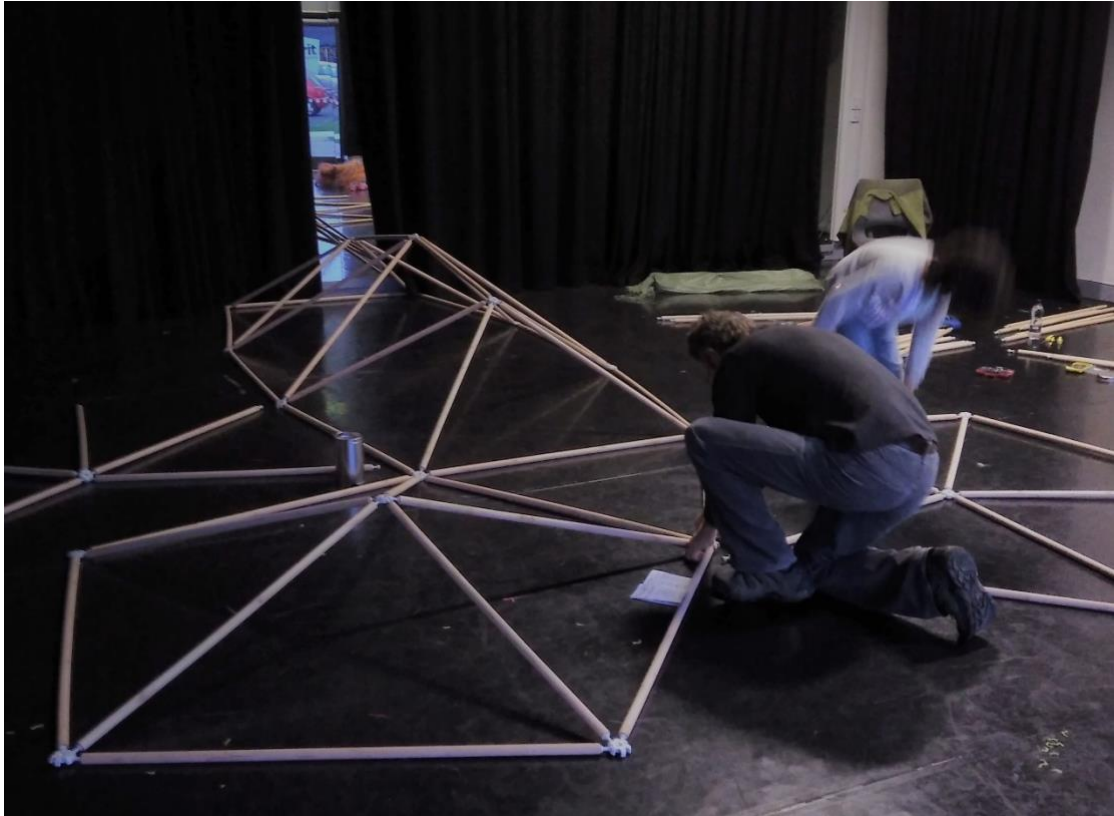


Figure 6-15 Building the shadow dome at Lakeside Arts

Interactive Technology: Black cardboard cut-outs of hares and flowers together with small LEDs, enabled the participants to make their shadow play. The cut-outs and the LEDs were attached to the end of a wooden rod to make it more accessible, and child-friendly. Two large paper butterflies with wings (Figure 6-16) that lit up were provided for the performer to animate when she sang the butterfly song from the first scene in the meeting room.

Play Patterns: Dens are associated with the enclosure play pattern, and children of all ages commonly make indoor and outdoor dens. Many younger children may have experienced them in nurseries and at home under the table. The design focused on

creating an enclosed space for the participants to explore transformation play pattern through light and shadow.



Figure 6-16 Paper butterfly with sticker LEDs and copper tape used inside the dome



Figure 6-17 Different types of fabrics were used on the dome

Multisensory materials: The dome was predominately a visual sensory experience. The light and shadow change the materials that have different levels of transparency and textures from smooth to rough (Figure 6-17). The soft parachute silk was good casting shadows on and while other more uneven fabric with holes and suitable to making shadows.

6.3.5 The Giant Flower

The giant flower became the impossible curious scenography in this scene. It was inspired by the *Rafflesia Arnoldii*, the world's largest flower. It is as tall as a toddler and has fun with physical features (Figure 6-18).

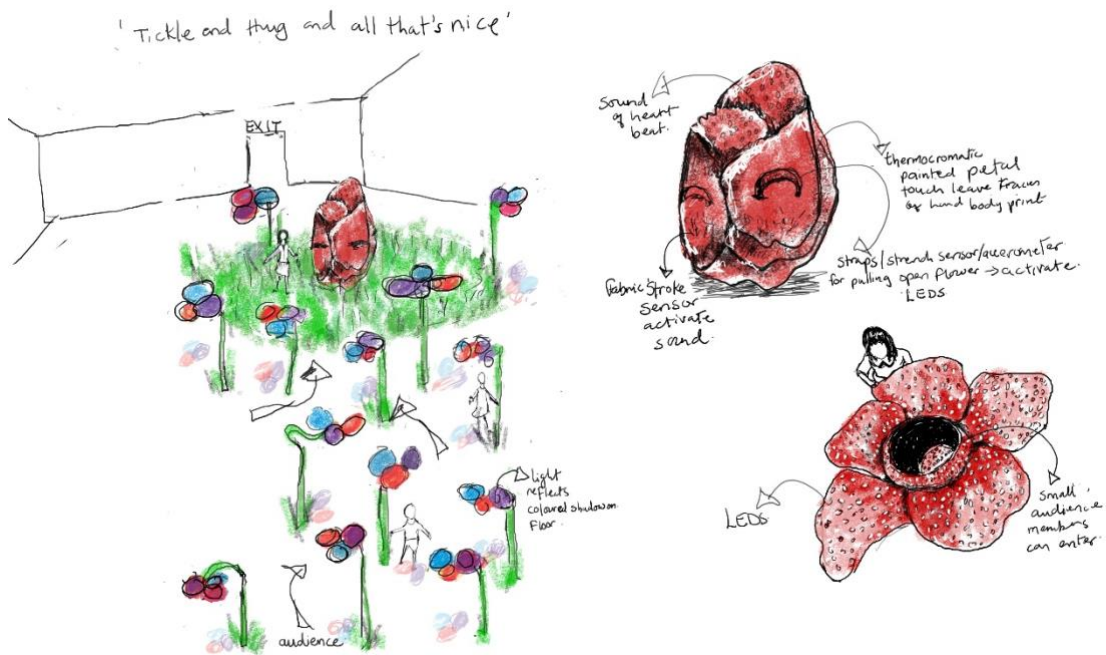


Figure 6-18 Design sketch for the giant flower

The scale is an essential consideration in scenography not only in making scale models, but objects on the stage – very large or small objects can be novel – a method to break preconceptions and add a sense of magic and curiosity in a performance. Scenographers and artists used the large scale in their artwork to emphasis a feature or a theme, for instance, Richard Hudson stage design for *Tamerlano* (2001) which featured an enormous foot pressing down onto a small globe (2004). Claes Oldenburg takes a different approach in his public sculptures with his oversize objects such as the giant lipstick or 45-foot clothespin that interrupts the urban landscape and relies there on physicality and tactility to draw attention.

The flower is made from red plastazote, a type of compress foam that is flexible and lightweight to allow the petals to be easily opened and closed by young participants (Figure 6-20) . The centre of the flower is rough and made from papier mâché

surrounded by multi-coloured soft faux fur (Figure 6-21). The inside of the flower is the hare's hiding place. Surrounding the flower was coloured circular mats and furry cushions.

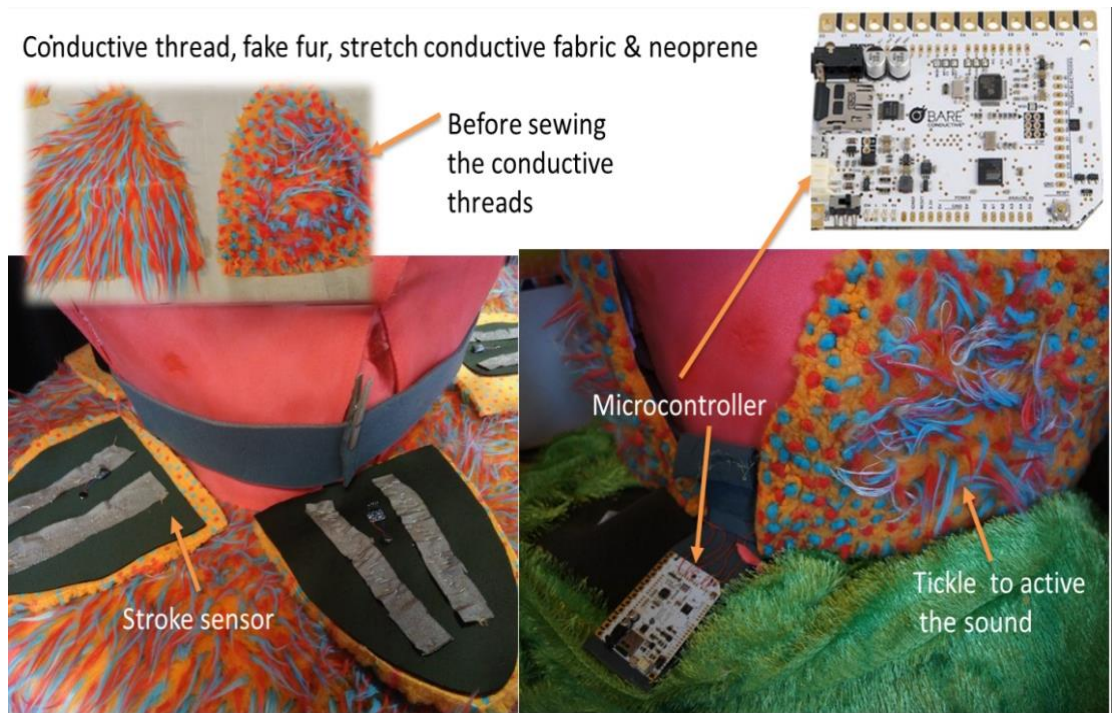


Figure 6-19 The giant flower showing the technologies used

Technology: Vibration and tickle sensors were used, augmented by electronic technologies and sound. Under the furry material, on the top of the flower, some small round vibrators are placed to create an impression of movement – a living flower. Five large tickle sensors are made from conductive threads, and fabric was sewn into a faux fur and attached to a soundboard and a small speaker at the foot flower. When tickled, they triggered the sound of laughter (Figure 6-19).

Play Pattern- Rotation was the original play pattern connected to the development of the flower the circular shape enables children to move round and round. I initially investigated motors to making spinning objects, and early design sketches had a Sun above the flower, which was not completed in time.



Figure 6-20 The giant flower with tickle sensors made from conductive thread and fabric

Multisensory: A combination of soft, rough and furry textures (Figures 6-20 and 6-21) was used to explore the sensorial qualities of touch. Tickling the flower to create the sound effects of a baby laughing and the Australian Kookaburra bird laughter was experimentation to see the impact of matching the interaction of stimulating with the sound of laughter.



Figure 6-21 Giant flower with a combination of textures.

6.4 Conclusion

In this chapter, I have discussed the development of the story and scenography for *The Runaway Hare* performance/installation. By exploring design for participation and experimenting with how digital scenography can be used in storytelling to enhance the audience experience and agency. Accordingly, I have introduced a structured narrative element and weave a story into an interactive promenade performance. The promenade format seems suitable for toddlers as it allows them to move around, discover the story and explore their surroundings (Figure 6-22).



Figure 6-22 *The Runaway Hare*, audience path in the Performance Arts Studio, Lakeside Arts

Each of the scenes privileging one of the five senses and is designed with different playful interactions for audience participation. Each of the scenes accommodated a fixed time for play to engage the audience and promote an understanding of agency. The main scenographic pieces allow for group interaction, for instance, talking to the tree or jumping on the meadow can be done by several members of the audience at the same time. While the smaller objects like the butterflies, boats, feathers, shadow puppets and funnels promote more intimate experiences for one child or a parent

and child. The performer leads the audience movements between the scenes; by doing so, she has control over where the audience goes. Her role is to facilitate the scope of possibilities for the audience in each scene. The audience agency lies within each scene. Although they are encouraged by the performer to interact with the scenography and space, they still can determine their experience, what they want to play with, or how they want to play. There are no long periods of just listening to the performer; there is always something for the audience to do. Thus, I tried to create an experience that balances the active role of the audience and the performer within a narrative structure. How the audience responds to the interactivity within the structure, if they behave differently than envisioned and what happens during the performances is discussed in the forthcoming chapter.

Chapter 7 STUDY 2 – THE RUNAWAY HARE

This chapter presents the data and analysis of The Runaway Hare performance with a specific focus on the immersive and play experiences and activities of the audience and performer. Drawing on the findings from the previous study *Into the Woods*, described in Chapter 5. The Runaway Hare Study provides the opportunity to investigate and study how interactive and digital scenography can help encourage audience participation, how the performer facilitated multisensory interactions and the role of storytelling. The performances took place at the Lakeside Arts Centre, Nottingham in January 2017. The audience consisted of children between the ages of 15 months and three years and their grown-ups. The research presents a model for an interactive, flexible performance where children can act on their curiosity and imagination. At the same time, the performer takes on the role of a storyteller and facilitator to support interactive play.

7.1 The Study

The study supports scenography/design practice and deepens our understanding of models for TEY performance and how digital technologies can be incorporated to help extend children interaction with scenography and play. The challenge of making promenade performance flexible and interactive is to understand better how children and performers respond and interact when storytelling and perform activities are linked.

The next section begins with an overview of the performance event and context then presents several vignettes from each of the seven scenes of the performance to demonstrate the audience interaction and engagement with the interactive scenography and the performer and followed by the finding of the data presented.

7.1.1 The Performance & Participants

The interactive promenade performance took place at the Lakeside Arts Centre, Nottingham. The 45-minute performance used a variety of spaces in the theatre -the meeting room, the foyer and studio performance space, as documented in Chapter 6. Lakeside Arts Centre is the well-suited venue as their staff are familiar with young audiences, they have adequate child-friendly facilities and programme a wide range of children's productions throughout the year.

Six performances took place over two days with a limit of 15 audience members per show. The performances were free and advertised locally and online around six weeks in advance on Facebook, the Lakeside Arts Centre's website, Twitter, Mumsnet and through A5 leaflets placed at the local venues including a library, a messy playgroup and cafes. This allowed for a more comprehensive recruitment strategy that in the previous study proved successful, and the performances were fully booked a week in advance. Mindful of the difficulties of reading the paperwork and taking care of a very young child/ren, the participants were emailed information about the research project, venue and the participant consent forms (Appendix 3). It provided them with the opportunity to read and sign the forms as well as to deal with any queries prior to the performances. A post-performance survey was emailed to the parents/carers a few days after the performances.

In total 29 children attended, ten were under two years old, and 19 were between two and three years old, the youngest being 15 months old. An adult accompanied all children, and in total 33 adults attended. Three children were late and missed the first scene (see table below). Each performance had between 10-12 audience members and four out the six performances had five children (see Table 7-1). The post-show survey revealed that for eight out of the 20 children (Appendix 4), *The Runaway Hare* was their first theatre experience. Seven had seen one to two performances previously; three experienced two to three and only one child had seen more than four. The promenade format was new to all respondents, and they found that the performance was different from any other TEY performances they had seen.

Participant Child (PC)	Age	Gender	Adults	Performance	Scene Attendance
PC 1	19 months	M	2	1	All
PC 2	24 months	F	1	1	All
PC 3	24 months	F	1	1	All
PC 4	24 months	F	1	1	All
PC 5	18 months	M	1	1	All
PC 6	21 months	F	1	2	All
PC 7	18 months	M	1	2	All
PC 8	24 months	F	1	2	All
PC 9	15 months	F	2	2	All
PC 10	29 months	M	2	3	All
PC 11	30 months	M	1	3	All
PC 12	22 months	M	1	3	All
PC 13	24 months	M	1	3	All
PC 14	24 months	F	1	3	All
PC 15	36 months	F	1	3	2 to 7
PC 16	17 months	M	1	4	All
PC 17	36 months	F	1	4	All
PC 18	36 months	F	1	4	All
PC 19	32 months	M	1	4	All

Table 7-1 Participant demographics

Table 7-1 Participant demographics continued

Participant Child	Age	Gender	Adults	Performance	Scene Attendance
PC 20	20 months	M	1	4	All
PC 21	24 months	M	1	5	All
PC 22	24 months	F	1	5	All
PC 23	24 months	F	1	5	All
PC 24	22 months	M	2	5	All
PC 25	24 months	F	1	5	3 to 7
PC 26	36 months	F	1	6	All
PC 27	36 months	F	1	6	All
PC 28	20 months	F	1	6	All
PC 29	18 months	F	1	6	3 to 7

7.1.2 The Data Collection and Analysis

As described in Chapter 3, the primary research method for data collection was to film the performances and reflect on the videos to clarify what goes on when the audiences and performer interacted with the scenography and what unfamiliar acts/critical incidences emerged out of the performances. Each of the six performances is filmed systematically. However, in the open play and exploration session, a more selective approach as the audience is dispersed. It was not always easy to know what to focus on as the children scattered as they explored the space. Taking an at the moment approach was looking around at the audience activities, then focus on an incident. Moving the camera without a clear focus allowed for capturing lots of smaller interactions between children and objects and adults and

children. If any of the audience members seemed anxious because of the camera pointing at them, it would move away and stop filming them. No extra microphones are used; consequently, some conversations between children and adults were inaudible.

All the videos are reviewed and catalogued, compiled into a short synopsis of each episode. Then two episodes are chosen one from a typical and one from an atypical performance for a more focused review and analysis. For all scenes except for the shadow dome, two vignettes were transcribed into a detailed account of the actions. In seeking to study these scenes; to gain a better understanding of the complexities of the audience and performers play, interactions and engagement with the interactive scenography and space. To capture the perspective of the performer, Sophie was interviewed for 45 minutes to find out her experience. For the parents/carers, the post-performance questionnaire emailed for feedback of their and their child's experience and to find out the post-performance effects on their child/ren. As a result, data is for 20 out of the 29 children who attended (see Appendix 4). The questionnaire was emailed as some very young children can get tired and restless at the end of an event and parents can find it challenging to complete a survey. Some informal conversations amongst the parents/carers, Sophie and the researcher took place at the end of some performances. In particular, we asked the adults about the balance of the structured and unstructured parts of the performances and have incorporated some of these responses into various sections in this chapter.

7.1.3 The Deployment

On arrival at the venue, foyer participants are welcomed and given research consent forms for themselves and their child/ren to complete. They waited in the Theatre Foyer until the performer arrived to greet them and to lead them into the meeting room for Scene 1 (see Figure 7-1). They either sat on the chairs or join the performer on the carpet. At the end of scene one they are led back into to the foyer and to the Performance Arts Studio for scenes two to six – the magic tree, the music meadows,

the butterfly dome, the giant red flower and an open-ended play session. The audience was led by the performer to each scene except for the open play when she moved around freely interacting with children and grown-ups alike. After between 15 to 20 minutes of free play, the performer gathers the group and leads them back to the meeting room for the last scene. With the story resolved, the performer and I thank the audience for taking part at this point everyone claps, and the audience gathers their belonging and leave.

7.2 Scene Analysis

The following sections present the analysis of each scene in the performance. There are two vignettes selected for each scene except for the dome where only one scene was selected. The vignettes in each scene are identified with two numbers the vignette number and subsection number, for instance, vignette 2.3 is the third subsection section of vignette 2. There can be numerous subsections in each vignette. The children are identified as PC (participant child) and number.

7.2.1 The Red Suitcase

Overview of Scene 1

On entering the meeting room, the audience is welcomed by the performer and introduced to the story plot. This first scene starts in the meeting room next to the performance studio space (see Figure 7-1). It has standard lighting, tables and chairs; the aim is to help children relax and get them familiar with the story and the storyteller. It also had space for the adults to leave prams, bags and shoes.

This scene typically lasts six to seven minutes, and Sophie followed a similar script in each performance. Twenty-six out of the 29 children attending the performance experienced this scene and three children arrived late and joined the group in either scene two or three. For every performance, Sophie sat on the floor while the audience occupied either a seat or joined her (see Figure 7-1). She enthusiastically introduced herself to using her real name and asks each child their name. Then Sophie talks

about the hare's personality and the reason for their visit. Next, she asks them to take off their shoes so as not to wake up the hare, and she slowly opens the red suitcase and finds that the hare is missing. Sophie reveals the contents in a suitcase (see Figure 7-2) and tells the story of each object about the hare.



Figure 7-1 The red suitcase, Scene 1, the audience journey

She begins with the photographs, then the boat, the butterfly, the tree and the flower. Finally, she packs up everything into the suitcase and asks the audience if they would come with her, to find the hare. Some children respond with nods, others verbally and some grown-ups explain to them what is happening. Everyone gets up and follows the line of grey tape on the carpet to the foyer, then through a door and down a corridor into the Performance Arts Studio. All six performances followed this similar format with small deviations according to the audience levels of interactivity with the objects. Children, like adults, often need time to get used to new experiences and situations; this was evident from the previous study *Into the Woods*. In *The Runaway Hare*, in all six performances, most of the children sat close to or on the lap

of their grown-up for this scene. Of the 29 children, only nine actively touched or played with the objects from the suitcase.

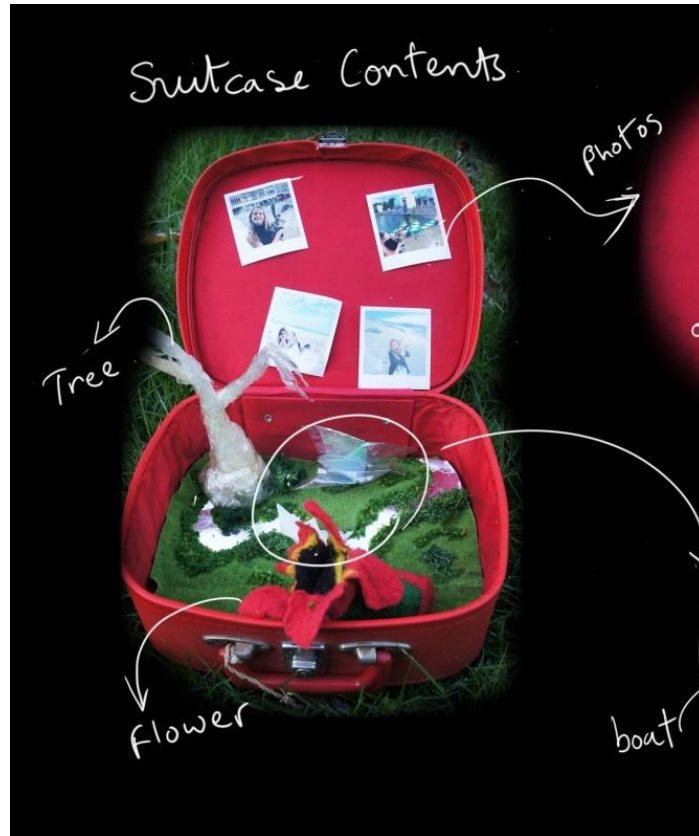


Figure 7-2 The red suitcase contents

For some of the children, this was their first theatre experience. We tried to make the rules of engagement explicit to allow them time to relax and not feel forced to interact. All the parents were informed about the relaxed nature of the performance *via* email and print before the performance. However, it was reiterated at the end of scene one when Sophie said to the adults *“Big people your children are the bosses here if they want to wander away from the story that is fine with us!”* (Vignettes1.1).

In the next section, a series of short vignettes from two different performances are presented. They represent different modes of engagement observed in Scene 1. Two performances were chosen: Performances 4 and 5. Performance 4 was a typical performance where one or two children interacted with the props in the suitcase. It took place at the end of Day 1 and five children and six adults attended: PC16 – 17

months, PC17 – three years old, PC 18 – three years old, PC19 – two years nine months old, and PC20 – 20 months old. The scene lasted 6:50 minutes. Performance 5 was unique in that most of the children interacted with the props from the start. They revealed their interest and preoccupations with the objects and material. It took place on Day 2 and four children and five adults attended: PC21 two years old, PC22 –2 years old, PC23 –two years old, and PC24 – 22 months old.

7.2.1.1 Scene 1 Vignettes 1 and 2

The moment the audience walked into the meeting room; the performance began. In the following vignettes, Sophie welcomes the audience and introduces herself and then asks the children their names (Figure 7-3). Most of the audience has settled down and are looking in the performer's direction. The images below give a sense of the audience positions at the start of both performances.



Figure 7-3 The audience's position – inner and outer circle. Standing and sitting on the floor, laps and chairs near and far.

Performance 4 has a mixed group of children.

'My name is Sophie, and I want to learn all of yours' pointing to PC17 on her left who leans back and forth looking directly at Sophie, she speaks very softly, and Sophie cannot hear her. Her grown-up says, 'she always gives you the full name,' some adults laugh. Her grown-up says her full

name to Sophie, and she repeats it. All the grown-ups and children are looking in Sophie's direction. Sophie points to PC18 sitting on the chair and asks what is your name? Sophie did not hear her, and her grown-up repeats her name, and Sophie repeats it. She then asks PC19, who is sitting on his grown-up's lap, he turns his head away and does not reply. Sophie says "you do not have to tell us." (Performance 4, Vignette 1.1.)

In Performance 5, there is more communication between the performer and children.

'So, Hello, it is nice to see you all, my name is Sophie' and she waves. Two adults are standing in front of chairs taking off their coats. PC21 is on the chair to her left responds by saying "My name is....." Sophie responds "Nice to meet you...." All the children are looking at Sophie, PC22 answers "I am.....", Sophie is distracted as PC22 say something to her, Sophie then ask PC21 "is your name...?" and PC21 say "yeah". Sophie replies to PC21 "so what? Is your name....." and repeats his names three times. PC21 responses "Yeah." He moves around in his chair and faces his grown-up; she brushes his hair with her hand affectionately and smiles. Sophie asks PC22 her name and her response; she says "nice to meet you..." (Performance 5, Vignette 2.1.)

In the vignettes 1.1 and 2.1, Sophie looks directly at each child when she spoke to them and sometimes waved her hands. Some children willingly answered her question while their grown-up companions helped others because they were too young, did not answer, or they spoke too quietly. Sophie made sure that a child did not feel obligated to answer when she said in performance 4: "you do not have to tell us'. Each of the performances is slightly different as the performer improvised and adapted her greetings. The aim was for the audience to meet the performer, make a direct connection and lose the anonymous nature of traditional performance. Most of the children in the two performances responded to Sophie, and some she did not even need to ask, like PC21 in vignette 2.1. In the next example, Sophie is introducing

the character and the purpose of their visit. Sophie usually clarifies the differences between 'hair' and 'hare', explaining that a hare is like a rabbit, this was included after the first two performances when we realised that the grown-ups were explaining what a hare was to their children.



Figure 7-4 The children follow the performer's gestures in Performance 5

'Today I want you to let you all, meet my friend, who is a hare' (with her hand over her head) she gestures ears 'who has big long ears like a rabbit, but bigger'. PC21 says 'me bigger', and Sophie responds saying 'you bigger than my hare' 'actually, he has got a lovely little nose and snuffly little mouth' and animates her face, all the children are looking at her, except PC21 who talks to his mother. Sophie continues 'sometimes he is cheeky', PC22 says 'I have a nose'. Sophie responds by pointing to her nose and saying, 'you have got a nose'. PC21, say 'I have got a nose, I have a nose'. Sophie says to him 'let's see if it beeps good!' PC21 says 'beep', Sophie continues 'and guess what my hare is doing right now; he is having asleep' (Figure 7-4) (Performance 5, Vignette 2.2.)

Sophie's action became more animated when she used gestures (see Figure 7-4) to demonstrate the hare's characteristic features and actions. Some of these children and grown-ups imitate, and it seems to help children to engage in a conversation with the performer and identifying similarities between themselves and the hare. At the same time, the suitcase and the objects encouraged three out of the four children in Performance 5 to move forward, as seen in Figure 7-5.

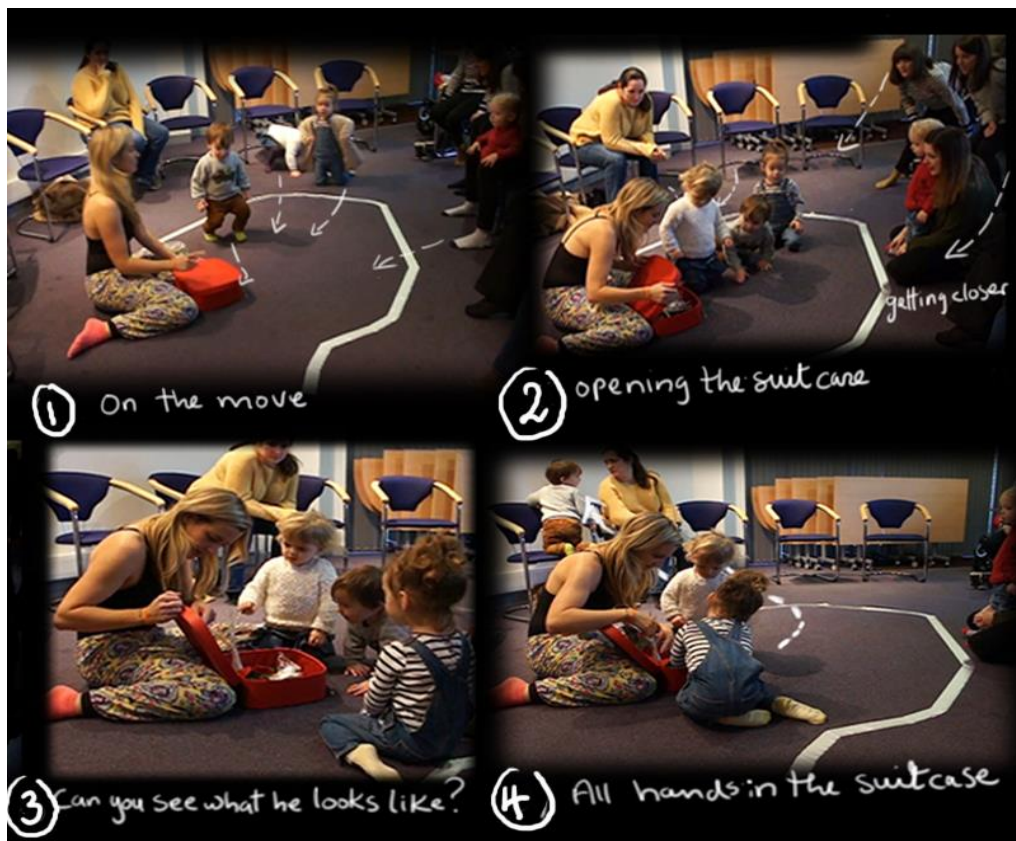


Figure 7-5 Opening the red suitcase

(1) Sophie 'shall we have a look inside?' and PC21 say 'Yes,' and moves towards the red bag. PC22 and PC23 walk on their knees towards the suitcase PC24 gawn up moves him closer to the suitcase. (2) Sophie says 'Shhhh!' and slowly begins to open it. All four children are looking with anticipation. Sophie opens the top of the lid and says 'Good morning, hare, Good morning' 'Oh?. He is not here?' PC21, 22 and 23 all crawls up towards the suitcase and look inside. 'Where has he gone?' (3) 'She then

points at the pictures on the inside.' Can you see what that is, what he looks like?' PC21 say 'Rabbit' and (4) gets up and walks towards his chair. Sophie 'yeah, like a rabbit, but bigger, he is a hare' PC22 is looking at Sophie, while PC23 puts her hand into the suitcase. From Performance 5 Vignette 2.3.

PC21 (2 years) demonstrated how a child's level of engagement could remain high even when physically moving around. He was quick to react to most of Sophie's questions, also though he was moving around quite a bit- rolling on the floor, talking to his mother, climbing in and out chairs. His actions and his interruptions could seem problematic for a performer, but Sophie's openness, flexibility to adapt and anticipation of children's reactions seem to help her to manage the situation without any unintended distress. However, on closer examination of his verbal responses and interaction with the objects demonstrates otherwise. Sophie's open-ended questions became his catalyst for a verbal reaction. Some children used nonverbal action and gestures to express and acknowledge their interest. PC22 moved down to the floor and shifting closer to the suitcase during a song about a butterfly and responded to Sophie's questions with a nod. PC20 (20 months old) was the only child to handle the objects in the fourth performance.

When the suitcase opens, his mother moves onto the floor with him, to bring him PC20 mother encourages him to move forward by pointing. When he wanted to get even closer, he sought her approval and reassurance by looking at her and only moved closer when she raised her hand. His actions suggest he assigned ownership towards the objects closer as seen in Figure 7-6.



Figure 7-6 Object ownership (1) Moving closer (2) Sophie takes the tree out of the suitcase. ‘The magic tree, we should go to the magic tree together, the magic tree is lovely because it is, it is glowing and beautiful.’ Sophie then asks PC20 ‘Do you want to see?’ (3) PC20 moves to his grown-up and gives her the tree and (4) collects a butterfly and hands it over.

He collected them rather than played with them; he gave them to his mother to keep (see Figure 7-6, numbers 3 and 4). At the end of the scene, he was reluctant to give the objects back, but his mother encouraged him, and he returned them with no apparent distress. Children understand ownership of their property by the age of two and by three, they usually know what belongs to others (Rassano *et al.*, 2011). Adults can help them manage their expectations as PC20’s mother did in this vignette.

To engage more children, the performer brought the objects to them by pushing the suitcase closer. In both performances, most of the children were happy to smell the flower, even though they had not touched any of the other objects. However, in some cases, when they were not ready or not interested, she turned to their grown-up instead. PC24 (22 months) was the youngest and the only child to stay close to his growing up in the fifth performance. In the next vignette, Sophie brings the flower for him to smell.

“I think it smells nice, oh, it does!” putting the flower up to her nose. She walks to PC24 whose gaze was directed to the window and was pointing at something, muttering words and turns and looks towards Sophie. She kneels next to him and says “want to smell, smell it mummy?” and raises it to her nose. She says “it smells beautiful.” Sophie faces PC24, but he looks and shows no signs of being interested in smelling it, even after some encouragement from his mother. (Performance 5, Vignette 2.4.)

Parents perform many different roles with their children; some sit back and let the child interact with the performer and others were more encouraging. PC24 looked on at the performance while standing and occasionally lost interest. Twice he seemed a bit distracted when he pointed outside, suggesting he may have been interested in being somewhere else. Some children wanted to share their experiences with their grown-up. For instance, PC21 moved around, interacting with objects but always returned to sit or talk to his mother. While PC23, called out to her mother to show what she found in the suitcase in the next vignette.

PC23 says, holding a handful of grass from the suitcase “he like grass.” Sophie replies “he like grass and butterflies.” PC23 stretches out her hands toward her grew up (sitting on a chair) shows her the grass and says “I have got the grass.” Sophie sings the butterfly song. PC23 turns and faces her grown-up with outstretched arms saying “I have got grass.” (Performance 5 Vignette 2.5.)

In Performance 5, the young audience was the most responsive of the six performances. However, as the rest of the children became more relaxed and felt safe

as the performance progressed to the larger and more theatrical space, we see in next sections how they became the young ‘players’ and displayed confidence and initiative regardless of their age.

7.2.2 The Magic Tree

Overview of Scene 2

The magic tree is the first scene the audience encounters in the performance studio (Figure 7-7). The atmospheric space is in stark contrast to the meeting room. For most of the performances, the adult audiences choose to sit on the floor around the tree. The children stood either close to the tree or by their grown-ups. Sophie starts the scene by waking up the tree by talking or singing to it.

In some cases, the children are encouraged to make a sound to activate the lights in the tree. In their search for her hare at the bottom of the tree, they discover feathers, funnels and butterflies. In the first scene, only nine children actively interacted with the objects from the suitcase compared to the second scene when 26 out of the 29 children. They seemed relaxed, and their behaviour reflected this by moving around the space without a grown-up, playing with the props.

They were responding to the performer, playing with their parents and actively communicating with their grown-up about current activity.

The vignettes are from transcriptions of Performances 2 and 3 that took place on day one. Performance 2 had the youngest child audience member PC9, at 15 months (see table), and PC6 (21 months), PC7 (18 months) and PC8 (24 months). All the children in this group attended the first scene, and one child came with two parents. The third performance on Day 1 had six children and seven adults. It was the largest group of children we had, and they were older than the previous group with a range of 22 months to 3 years. PC10 (2 years, five months), PC11 (2 years, six months), PC 12 (22 months), PC13 (2 years) were these at the start, and PC14 (2 years) and PC15 (3 years) arrived at the end of Scene 1.

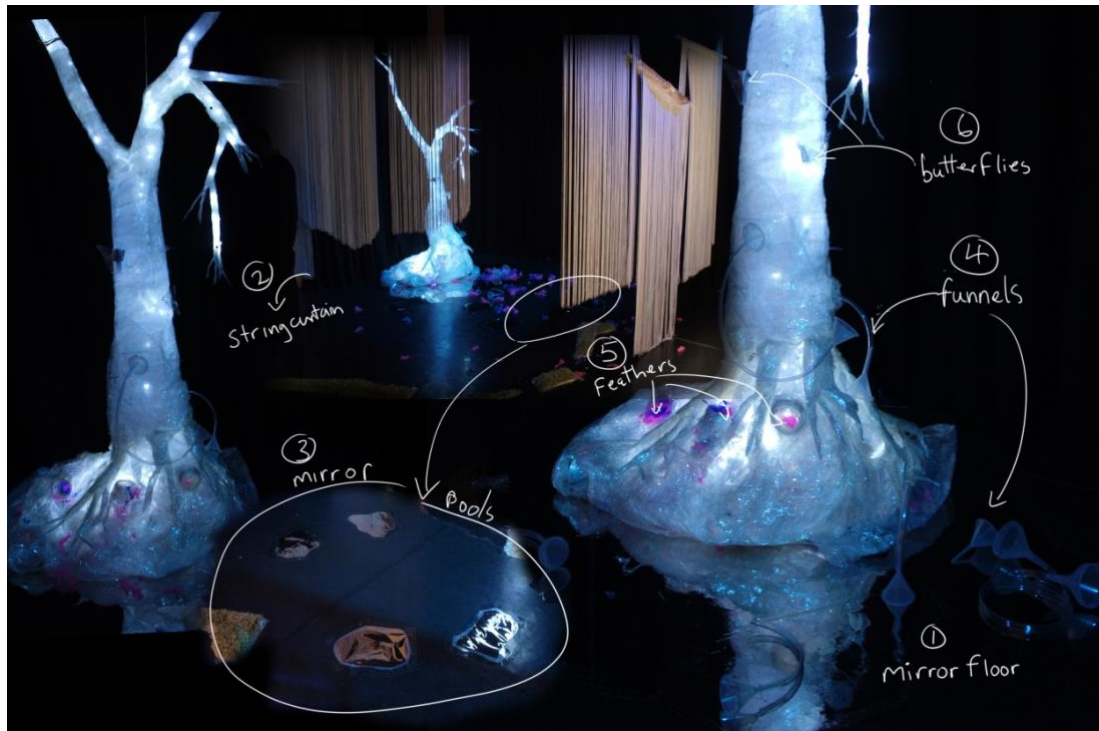


Figure 7-7 The magic tree sits on the mirrored surface surrounded by white string curtains. Small oval mirrored shapes like pools of water create a pathway from the tree. Curious funnels with long nozzles surround the bottom of the tree-like fallen flowers; feathers lay in waiting in holes of in the rock and the cellophane butterflies disappear into the fabric of the tree trunk.

The two performances chosen are for more detailed analysis because of the young audience age differences; they demonstrate different, interactive and improvisation strategies and how the performances evolved. In the first two performances, we realised that many children did not talk to the tree, so we decided to look at other ways to create sound.

7.2.2.1 Scene 2 Vignettes 3 and 4

The next two vignettes occur at the very start of Scene 2; in both performances, Sophie drew the audience attention to the tree with magical powers. In the second performance, many of the grown-ups stood or sat near the string curtains on the edge of the scene while in the third performance most people sat closer and two adults were very near the tree with their child (Figures 7-8 and 7-9).

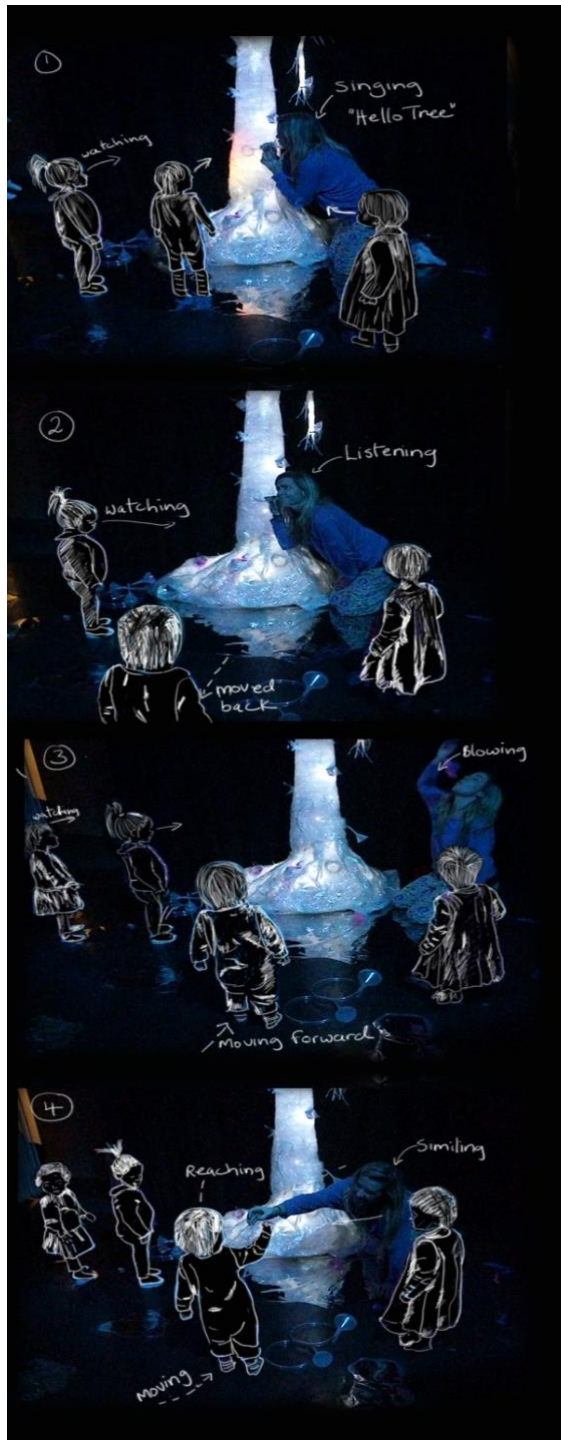


Figure 7-8 Performance 2, vignette 3.1

1) "Ugh, I do not know where my hare is, shall I ask the tree?" "Hello, Hello" Sophie blows into the funnel 'ooh', then starts to sing "Hello tree do you know which way I should go I want to find my hare, I cannot find him anywhere." The children look at her and the tree as she triggers the colour changes on the tree trunk.

2) PC7 moves closer to his grown-up but continues to watch, then Sophie puts the funnel to her ears to listen. All the children are standing away from their grown-up looking at her. She whispered (inaudible) and says "eh-hum" and looks around.

3) "Maybe he is down a rabbit hole?" and she pushes her hand into one of the holes in the front of the tree. Looking at the children, she points at the holes and says "Eh, you can look down a hole if you want?" PC7 walks forward. Sophie continues to put her hands down the holes. She pulls out a handful of feathers and says "look at this," letting the feathers drop, she keeps a few and moves back her head and blows it up into the air then laughs and says 'feathers.'

4) "They are nice and soft, aren't they." She picks up a feather and sways in front of PC7 who reaches for it. All the children are looking at PC7. She then gets another feather and blows it. (Performance 2, Vignette 3.1).

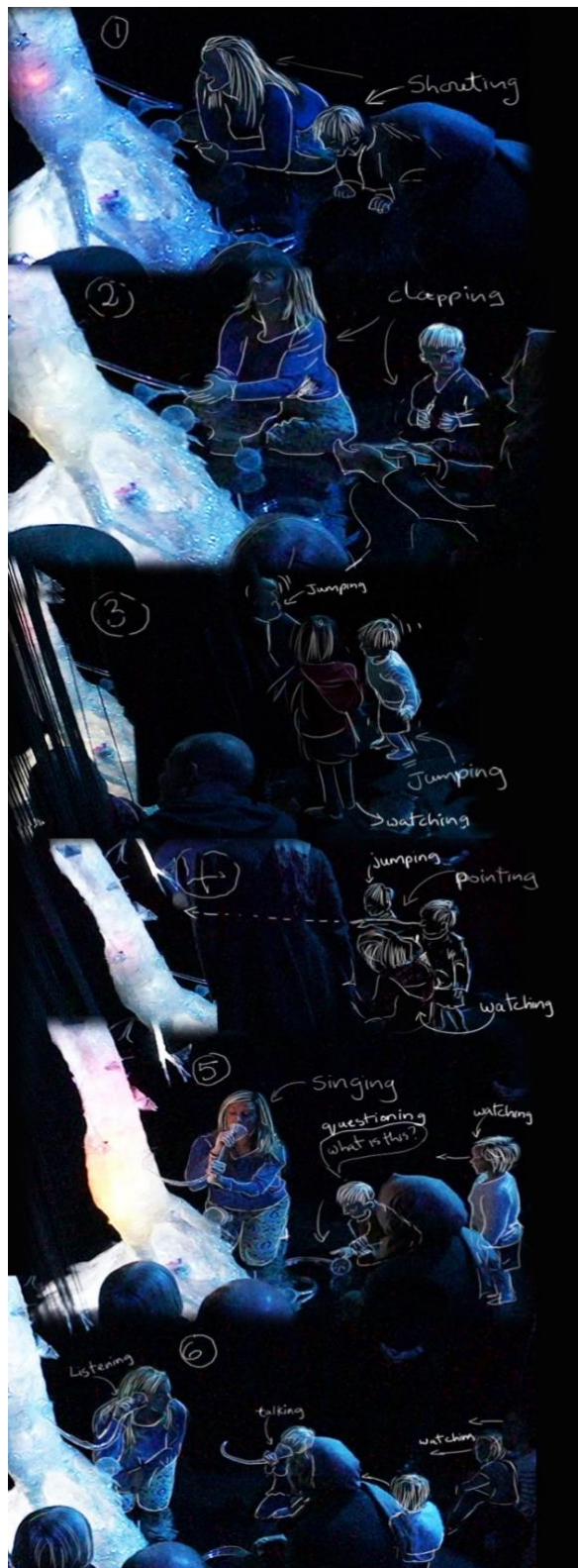


Figure 7-9 Performance 3, Vignette 4.1.

1) ‘Oh wow!’ ‘It is the magic tree shall we wake it up, shall we try and wake it up by making noises, shall we say “Woohoo!” Some of the children and adults repeat “Woohoo!” Sophie: “Shall we say Aha!” They repeat “Aha!” The coloured lights are triggered on the tree trunk.

2) “What about some claps shall we do some claps!” Sophie “We made it wake up a little bit, but we can make it even more.” Sophie looks up at the tree.

3) “What about some jumps that might work.” A few children and one grown-up stand up. Sophie jumps and says “OH!” Three children PC13, PC14, and PC12 (with the help of his father) jump up and down. PC10 stands but does not jump.

4) Sophie exclaims “Oh, look!” “It goes to a lovely colour when we jump” (pointing to the magic tree). PC14 points at the tree while jumping. The children continue to jump. Sophie stops jumping and says “Oh? I wonder whether I should ask the tree if he knows where my hare is?” “Shall I ask him?”

5) Sophie reaches for the funnel and says “Hem um Hello” PC13 says “What is this?” Sophie looks at him. “Oh! Yeah, you can have a look, you can pick it up if you like?” Sophie sings “Hello tree; Hello tree, do you know which way I should go, go, go, I want to find my hare. I cannot find him anywhere.”

6) Sophie puts the funnel to her ear and listens. PC13 picks up the hose with two funnels looks at it, then puts it down and picks up the one with one funnel, then he puts it over his mouth and utters some words (not audible). (Performance 2, Vignette 3.).

In both performances, the children were attentive; some moved around and interacted with the performer others watched the action close up.

Noticeable in Performance 2 (see Figure 7-9) is that the children are all standing separate from each other, and one child initially interacted with the performer, compared to Performance 3 where the group is much closer together, and three children actively participated. Sophie anthropomorphises the tree, giving it life and human characteristics. The performer's strategy in both performances is somewhat different. In the second performance, Sophie only talks to the tree at the beginning of the scene, in contrast to the third performance, where she elicited an invitation to participate.

Her call-to-action in the third performance used physical and nonverbal cues, fun activities which seem to engage and compel the children to act compared to the second performance. Sounds like "Woohoo!", clapping, jumping, shouting, talking, listening and singing facilitated a multisensory shared group experience (see Figure 7-9). Also, Sophie informed this group about the tree effects by saying "Oh look! It goes to a lovely colour when we jump" (pointing to the tree).

Moreover, immediately PC14 points to the tree while jumping, perhaps acknowledging the tree colour change. It is difficult to tell whether all the children understood that their actions changed the colours on the tree. In Performance 2, when Sophie sang, and the tree changed colour, PC7 moved closer to his grown-up (Figure 7-8). This may indicate he noticed and was a bit surprised. Some children in Performance 3 demonstrated self-initiative, PC13 interrupted Sophie to ask her about the funnel so he could make a sound (Figure 7-9). PC 12, just 22 months old, copied the adult's actions next to him and seemed to be testing the effects of his voice on the tree as seen in the next vignette below.

PC10's mother picks up a funnel and says "da, da" into it. PC12, who has been playing with feathers moves forward next to PC10 and picks up a funnel, puts it around his mouth and says "DA DA". PC10's grown-up imitates PC12 and talks into the funnel. PC12 looks at her, then looks up

at the tree with funnel around his mouth and says “go, ga”. The coloured light appears on the tree, then he says “ga, ga” again and triggers the light. (Performance 3, Vignette 4.2.)



Figure 7-10 Performance 2, Vignette 3.2. Whatever takes your interest.... variation of simultaneous play activities within the performances.

“Oh, the butterflies!” “They love the tree, don’t they?” Sophie stands up and says “LOOK, LOOK, they are here!” and takes a butterfly down from the tree, everyone looks up at her. She animates the butterfly as if it is flying and moves it to PC11 and puts it down in front of him and says “this one wants to come to you, your one, your butterfly.” All the children are looking except PC13 who is busy playing with the feathers.

Sophie gets back up and looks for another butterfly and says “There is another one” all the children are now looking at her as she picks another butterfly from on the tree trunk, and says “another butterfly, hello butterfly” and she moves it towards PC12. PC15 has her hands outstretched, and her gaze followed the butterfly to PC12 and leaned over to get a better look. Sophie says to PC12 “There that is your butterfly, hands full so you need to...” His grown-up takes it for him. PC12 puts down the funnel, and he takes the butterfly from his grown-up and puts it up into the air. Sophie then looks at PC15 and asks her name [she arrived late, so missed the Scene 1 introduction]. Sophie stands up and says ‘...Oh, what a lovely name. I wonder if there is a butterfly that wants to float to you, I think there is one, which one, this one, this is your one.’ Sophie sings ‘butterfly, butterfly, floating gently through the sky I can see you here and there floating flutter everywhere” and gives the butterfly to PC15 who turns around to her grown-up and gives it to her with a smile and looks back at Sophie who is still singing. (Figure 7-10) (Performance 2, Vignette 3.2.)

PC10’s gaze was directed at the tree when making the sound in the funnel, and he repeated it as if to test what was happening. Three children used the funnels in this group. The smaller objects were desirable to the children. They were fun, and the children enjoyed them. When feathers or a butterfly were offered, some children stretched out their arms ready and waiting to receive the object from Sophie even if they did not come near the tree (see Figure 7-10).

Figure 7-10 also demonstrates the variety of activities that coincided. Some children followed their interest. In both performances, one child was interested in feathers, and in both cases took the feathers and butterfly to their grown-ups that were seated away from the tree (Figure 7-10, b & c). The performer's song usually refocused the group's attention for a short period, as seen in the vignette below

Most of the children took the butterfly from Sophie, except two children from Performance 2, who seemed happy to watch (Figure 7-10, c). The butterflies, like the feathers, facilitated direct contact between the performer and each child. The butterflies were a recurring object that connected the scenes, and the children were encouraged to take them on the journey. PC15 was very interested in the butterflies, and her gaze follows the butterfly that Sophie gives to PC12's mother, and she seems to be practised in turn-taking. Still, her desire for the object was demonstrated in her altering her position and gaze as she stretched out her arms to receive the butterfly from Sophie (Figure 7-10 image 1). PC15, who missed the first scene, seemed to be happy with the direct interaction and individual attention as she smiled after she received the butterfly.

The performances end with Sophie moving towards the meadows, directing the children to bring along their butterflies as in the following vignette:

Sophie asks the group, 'Shall we take our butterflies and see if we can find our hare somewhere else, maybe he has gone to the jumping fields?' Some of the grown-ups begin to stand up. 'I am going to go on this path, bring your butterflies, bring your butterflies, flutter, flutter, flutter...' Everyone is now standing, and as he or she walks to the next scene, Sophie's voice is heard 'LOOK! The jumping fields!' (Performance 3, Vignette 4.4.)

Some children are ready to move forward without their grown-ups, and others are still absorbed in playing. Sophie's question gets the parents up, and it becomes a sign for the children to move. Sophie's tone of voice contributes a sense of excitement, which could help the children to follow her when she shouts "LOOK! The jumping fields!"

7.2.3 The Musical Meadow

Overview of Scene 3



Figure 7-11 The musical meadow with the little boats, daisy chains and the rock

The children seemed more relaxed in this scene and demonstrated self-initiated activities by asking questions and moving forward without a grown-up. In many of the performances, the children followed Sophie onto the meadows (Figure 7-11). The adult audiences usually stood at the edge of the meadow and looked on, until they were invited by Sophie to join the children. The scene begins with the audience exploring the meadow, playing on the daisy mounds and Sophie talking about how her hare plays on the grass. Everyone takes a seat around the meadow after jumping or exploring it, usually initiated by the performer. Most children sat next to their grown-ups. The centre of the meadow became the main space for the children to move around. When everyone is seated Sophie brings out little boats and sings the “Hello Boats” song to the same tune as the ‘Hello tree’ song in Scene 2. The boats are very popular during the performance; most children play with them. After a few minutes, she finds a note from her hare in the rock, along with some daisy chains he made for the children. A few children wore the daisy chains, bracelets, others

examined them, and some were not interested. During the six performances of this scene, sounds continuously triggered intentionally and unintentionally. A few children actively triggering the sound during the performances, some played and jumped when they first step on the meadows, but overall, they were used more during the free play. There were eight daisy mounds (Figure 7-11) that could be activated, and some were programmed to be random, so stepping on a particular mound produced different sounds. The natural sound effects added a sense of the place – being outdoors with the crows, owls, ducks, water and wind. The sound sometimes became the catalysts for the story and children repeated them during the scene. The design affords full-body interaction; the audience could stand, jump, roll or touch the daisy mounds to activate the sounds. After about five to six minutes of playing on the meadows, Sophie leads the group to the next scene. The two performances (4 and 6) selected for further enquiry both had children of a similar age group (see Table 7-1). They differed in that Sophie spent more time exploring the sounds in one. In both performances, the children entered the musical meadow alert and spent the time looking around curiously.

7.2.3.1 Scene 3 Vignettes 5 and 6

In each of these performances, a child notices the meadows from the tree before the performer makes her move and draws the audience's attention to it. Everyone gets up and follows the path to the meadows. In the previous scene, all the children seem comfortable and played with the props.

In the fourth performance, Sophie reaches the meadow first, and in sixth performance, a child leads the way and jumps on the meadow first. The vignettes start at the beginning of Scene 3 and end just before Sophie brings out the boats.

In both performances, most of the children came to the meadow without their grown-up's help or encouragement; only three children (18- 20 months) waited for their adults (Figure 7-12, image 4, Figure 7-14, images 3 & 4). Sophie entwined the story while the children explored the meadow - we find out more about what the hare likes to do and even hear him speak (Figure 7-13, image 4).



Figure 7-12 Performance 4, vignette 5.1

1) “See if we can find my hare, Oh do you know he loves coming here to the daisy fields, it is his favourite place, the jumping field, it is where he likes to hop and skip, happy and skip, happy and skip.” Sophie jumps around the meadow and then triggers a sound and says “Oh” then, triggers a few more sounds.

2) PC17 is holding the funnel in her hand as she slowly walks onto the field and stands to look at Sophie jump. The rest of the group walks in. Sophie says “He jumps all over the daisies”. PC18 and PC17 walks onto the field next to also with a funnel in her hands.

3) PC20 walks into the middle of the field with his arms up and wide-open palm. PC20, PC18, PC19 all follow Sophie. She says to the children “you can walk on the daisies as well”.

4) “Big people, you can come to the daisies if you want”. The grown-ups move closer. PC20’s grown-up moves on to the field towards him, then holds his arm and lifts him into the air and brings him back down on the daisy mound. She moves him up and down several more times.

5) A grown-up touches the mat and says “It feels soft”. Sophie bends down and touches it and says ‘it does feel nice and soft, Oh, it is lovely’. PC20’s grown-up stops moving him up and down and touches the flower and presses her hand into the middle of the daisy mound that they were jumping on and the sound is triggered.

6) Sophie moves her hand over the soft meadow while PC20 looks down at her hands. PC18 kneels down to touch the field, so does PC17 and PC19. PC16 & 20 are both standing up. All the grown-ups are now seated. Throughout the scene, the sounds trigger. (Performance 4, Vignette 5.1)



Figure 7-13 Performance 6 Vignette 6.1

1) PC26 heads towards the grass, Sophie follows. PC28 looks at them. PC27 says "look there is more grass" Sophie says 'there is loads of grass.' PC27 runs onto the meadow. Sophie follows her and says "That is one of his favourite places to be". PC28 grown-up shows her the pathway. They follow it holding hands and carrying a butterfly, funnel and some feathers.

2) Sophie stops and says "did you hear a funny noise?" Sophie stomps on a daisy mound "Oh?" she says. PC26 stomps on the flowers and says "Oh?" and her grown-up to says to her "do it again". She stomps on it and 'quack, quack'. Sophie responds "you have found a duck" and she runs up and down squealing. PC28 helps onto the meadow. PC26 jumps on a mound, and it repeats 'Where do you think I am?' then an owl is heard.

3) PC28 moves off the meadow but looks on. "Shall we try and make the noises with different bits, shall we try our elbow". Sophie stoops and uses her elbow to trigger two sounds. PC29 grown-up brings her over to sit on the meadow and PC28, and PC29 are watching from the edge of the meadow.

4) PC26 jumps from one mound to another with her hand on her ear and says "I hear your hare." Sophie says "sometimes when my hare comes here he lies down, lies down like a sausage and he does sausage rolls". All children are on the meadow.

5) Sophie rolls on the meadow. PC26's grown-up say "do you want to do some sausage rolls?" PC26 continues to jump on the mound. PC27 sit on the grass, touching the flowers. Sophie says "That is one of his favourite games".

(Performance 6, Vignette 6.1)

Sophie demonstrates different embodied actions to trigger the sounds. She made large gestures like stamping her foot onto the mound to illustrate how they worked. She also hopped, skipped, elbowed and rolled on the grass (Figure 7-13, image 3,4, 5). She supported the children's discovery of the sounds.

In Performance 4, the children seemed confident to move around on the meadow but did not trigger the sounds at first. They seemed to avoid stepping or jumping on the flowers until Sophie said: "you can walk on the daisies as well." In both vignettes, Sophie acted surprised when the first sound was triggered, and she said: "did you hear a funny noise?" The older children seem to link with the sound faster than the younger children. In Performance 6, PC26 imitated Sophie and was engaged fully with making sound by jumping on the mounds (Figure 7-13). She was the only one in both groups to be absorbed in the triggering of sounds throughout the scene. She recognises the sounds and responds to them within a narrative context. For instance, when she says "I think, I hear him again?" referring to the sound of the hare's voice.

The adults initially stayed off the meadows, so the children had the space to explore. In Performance 4, Sophie invited them onto the meadow; this enabled the children not only to share their experience with the adults but also for adults to support them. For instance, in Figure 7-12, image 4, PC20's mother helps him to jump on the mounds and trigger sounds but only after the invitation to participate. In performance four, the soft tactile qualities of the meadow material were highlighted by a parent, and it initiated the audience to investigate touch (Figures 7-12 & 7-13). They trigger sound intentionally and unintentionally with their hands by pushing, touching, pressing and exploring the carpet pile and the daisies. The polyphonic feature allows multiple sounds to play together. In Performance 6, Sophie tried to create group interaction through sound. She asks everyone to press the mounds in the next vignette.

Shall we try and make lots of noises all at the same time and press the mounds, other grown-ups do the same. PC26 looks confused and moves her head from side to side. PC26 says "I think it is from the "putter" and

points at the speaker. Her mum says “You think that is a computer?” PC26 goes to the speaker to investigate and returns and says “I do not think so?” and PC25 goes to investigate come back and stands by her mum.

(Performance 6, Vignette 6.2)

PC26 was confused when there are many sounds and is trying to make sense of it all, and she suggests it is a computer. She was very active during this scene, but always alert and listening to Sophie. The boats were given out to children just after everyone was settled and sitting comfortably. Like the butterflies, they were given to each the child individually as seen in the next vignette from performance 4.

- 1) As Sophie brings out a boat and moves it along the path singing ‘row, row, row your boat, gently down the stream’. PC19 crawls on all fours towards it then reaches out with his right hand for it. Sophie let him help her roll the boat along the path, then she let go so PC19 can have it, and he holds it in his two hands, looking down at it, while Sophie continues to sing ‘merrily, merrily, down the stream’, you found a little boat.*
- 2) PC16 is not interested in the boat; he’s playing with the butterfly in his hands. PC17 also holds a butterfly. At the same time, she shows her grown-up it. Then PC17’s grown-up alerts her by pointing in Sophie’s direction; she then turns around to see Sophie rolling the boat near her. PC17 stops to look at Sophie as she pushes a boat, its light turns off and on as she sings “row, row, row your boat gently down the stream, merrily, merrily, life is but a dream’ and leaves the boat in front of PC17 and says “more boats” then goes back and says “too many boats, aren’t they lovely.’ PC19, who is rolling his boat, turns and sees the one in front of PC17 and reaches to take it, leaving his boat behind. He looks at it rolls it on the path, his grown-up who is opposite him says something to him (which was inaudible).*
- 3) She takes it and rolls it over to PC17 and leaves it in front of her. PC17 picks it up, looks at it, and moves in on the meadow, and it lights up.*

PC16 moves towards PC17, standing and watching, he decides to give his grown-up the butterfly in his hand and looks down at PC17 playing with the boat. Simultaneously Sophie rolls the next boat in the middle of the field for him. (Figure 7-14) (Performance 4, Vignette 5.2.)



Figure 7-14 Performance 4, vignette 5.2

Sophie brings out the boats to the children; she sings ‘Row, Row, Row, Your Boat’ to refocus the audience’s attention. However, each child in Figure 7-14, image 2 seems busy with their interest; the butterflies seem particularly attractive to children in both performances. Children readily accepted the boats and left the butterflies behind. They enjoyed playing with them. They became very desirable, and some children took more than one. PC19 in vignette 5.2 took two, his mother brokers the situation and mimicking Sophie’s action; she rolled the boat to the intended child (Figure 7-14, image 3). Some of the younger children did not move around; they watched or played with the butterflies until the boats were brought out. Others, like PC20, were very active and even went behind the curtain to look for the hidden boats (Figure 7.14, image 2). The next vignette takes place a few minutes into the scene – Sophie creates group interaction when she asks everyone to make some sounds together, and all the adults press the mounds, and sounds surround the audience at the same time. The grown-ups were not usually asked to do anything, but in the next vignette, PC26 asks her mother to read the note that Sophie has just found in the rock with all the daisy chains on it.

Sophie turns the rock over and says ‘look what’s this? It is a letter’. PC26 takes it from her. Sophie says “who is it from can you have a look? There is a drawing of a rabbit. Maybe it is from him?” Sophie says. PC26 jumps up and down. “It is clue shall we read, yes” and she turns and walks over to her mother “mummy, can you read it?” Her mum replies “give it to Sophie to read it’ and PC26 replies “I heard it again” (referring to a triggered sound of the hare speaking) as she turns around. Sophie says “Ehh,” opening it up, “is there anything inside?” PC26 says “it is writing”, Sophie asks “what does it say?” “I do not know the words, you want to read it, mummy?” and passes it to her mum. Sophie says “Yes, mummy, please, can you read it?” “Good clue did for finding that,” and she points at the letter in PC26 hands. PC26 hears a squishing sound and the duck sound. “I heard the squish sound” says PC26, “ducks”

Sophie replies. 'Maybe he has been with the ducks today...' (Performance 6, Vignette 6.4.)

PC26 is very relaxed and excited about this incident; she demonstrates her self-initiative. She is confident to talk to Sophie and gets her reluctant mum involved. As a three-year-old, she understands what a clue is and seems invested in the story. Sophie also plays along with her and tries to make sense of the sounds she hears. At the end of the scene, Sophie gets up, and points towards the path leading to the dome and says 'As much as the boats are not informative, I have a funny feeling they are telling us to follow this path, so let's look for my hare this way.' At this point, the grown-ups and children stand up. Sometimes the children leave their grown-ups and follow Sophie into the dome while others go in with their grown-ups.

7.2.4 The Shadow Dome

Overview Scene 4

The 'shadow dome' is partly covered with various white and cream materials for shadow play. On the outside and inside of the dome a few of the flat discs used in *Into the Woods* were suspended, and butterflies are around the inside of the dome (Figure 7-15).

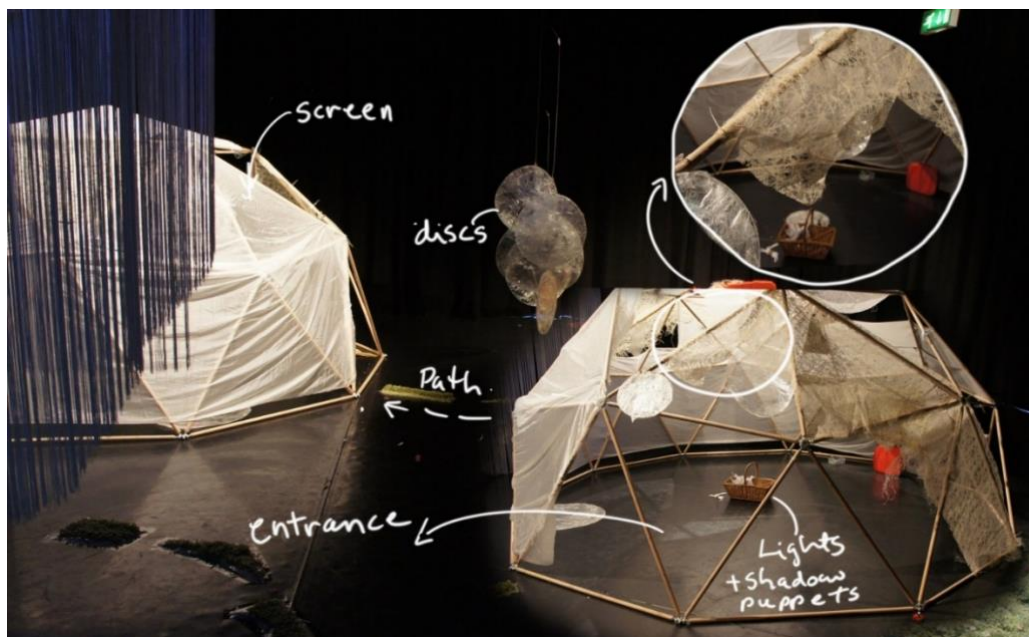


Figure 7-15 The shadow dome

When everyone is inside and seated, the lights slowly dim to a blackout, Sophie either shines a light and creates shadows of the hare around the top of the dome or gives light to each child and then a shadow puppet on a stick. After a few minutes, she animates a large paper butterfly and sings a song. After four to five minutes, a funny sound is a cue for the lights to come up and to move to the next space.

In all the performances the children enjoyed playing in this space, they all seemed relaxed in complete darkness and moved around the space quite confidently. Many parents were hesitant to come into the dome as the entrance was child sized and required them to crawl. Sophie usually reassured them by saying “big people, we can all fit in here!” Children often needed their grown-ups to help. Most of the grown-ups sat throughout the scene and did not move around, so the children had lots of space. The children were very active and used their lights not only for shadow making but also to light up the floor, themselves, the adults and the dome. In most of the performances, Sophie sang one or two songs and sometimes encouraged the adults to join in. When Sophie demonstrated the shadow puppet of the hare, children sometimes said ‘wow’. Only one performance is transcribed because there was no interactive scenography in the scene, and it was very dark and hard to see the actions. Performance 5 took place on Day 2, five children, mostly two-year-olds, and six adults attended: PC21 (2 years), PC22 (2 years), PC23 (2 years), PC24 (22 months) and PC25 (2 years), who joined the group at the beginning of Scene 3.

7.2.4.1 Scene 4 – Vignette 7

The children followed the path from the meadows and entered the dome before Sophie (Figure 7-16). Two children seem less interested and confident, one child moved towards the tree and was led back by his grown-up, and PC25 arrived late and remained close to her grown-up. The next vignette begins as the lights dim, and the interactions become more absorbed as the lights begin to dim PC25 and her grown-up are the last to enter the dome.

The dome gradually darkens, PC21 looks up and says “the light's dark”, Sophie response “Oh, maybe is getting to night time?” PC21 repeats “the light's dark” (Figure 7-17).



Figure 7-16 Entering the dome in Performance 5

Sophie gets a light and says “there is a light for you” and gives it to PC22, then to

PC23, PC21 gets up and moves to Sophie, and she says “a little light for you!” and gives him a light, he goes back to his mother, then walks around pointing the light onto the floor. PC24 goes over to Sophie, and she gives him a light which he takes to his grown-up. All the children except PC25 are standing up, walking around and sometimes looking as Sophie makes shadows of a hare moving along the top and sides of the dome.

PC24 points at it and sings “Oh little hare”, “Wow!” says someone (Figure 7-16). PC23 approaches Sophie and puts her hands out for a shadow puppet and says something to her (inaudible). Sophie says ‘yes’, then gives PC23 the puppet and she sings ‘oh little hare’ then Sophie copies her and sings:

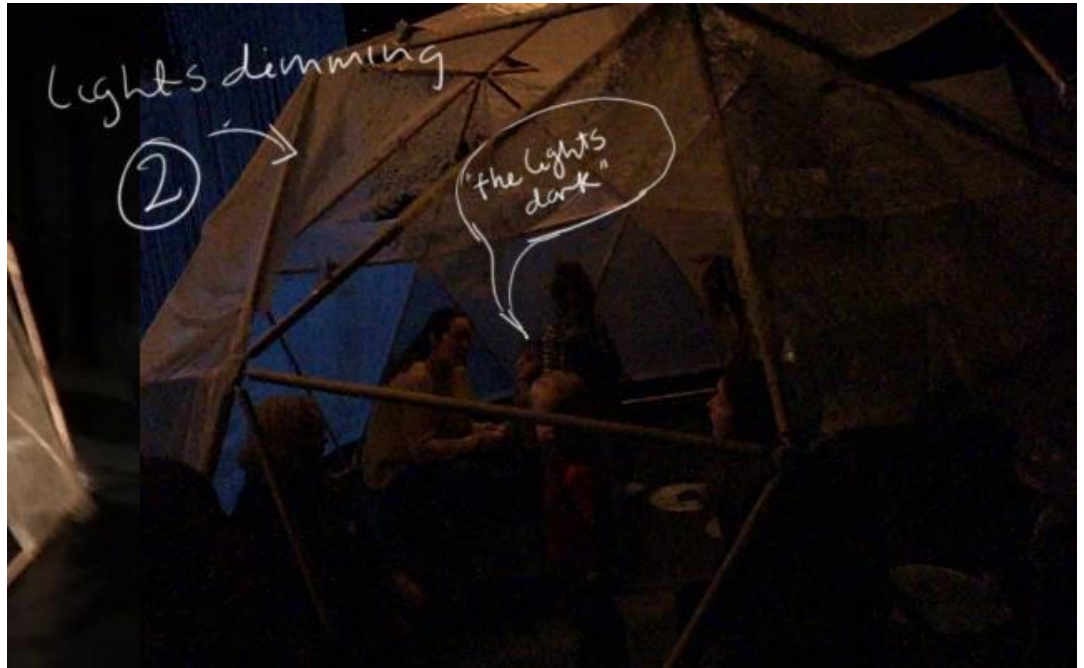


Figure 7-17 Inside the dome, Performance 5, vignette 7.1

'Oh little hare, jumping everywhere,' and make a shadow puppet of the hare that PC23 is holding. PC24 says 'anywhere' and points the hare to her grown-up it moves towards her. Then singing 'I am a little hare' Sophie gives each child a cut-out hare (it is dark and difficult to see accurately to describe the interactions.) (Figure 7-18).

PC21 tries to make a shadow with the light and hare puppet. Sophie talks to PC22 and PC23 who are standing next to her and hands them torch from the basket; she says 'Oh Yeah, Thank you, shall I shine in on the side?' PC22 or PC23 says 'Yeah!' and Sophie takes the two lights and she stands up and shines them on the top of the dome and says 'cheeky little..... Jump, jumper, jumper.'

Then, kneeling she says 'you are making a good job of making the thing jump.' (Performance 5, Vignette 7.1.)

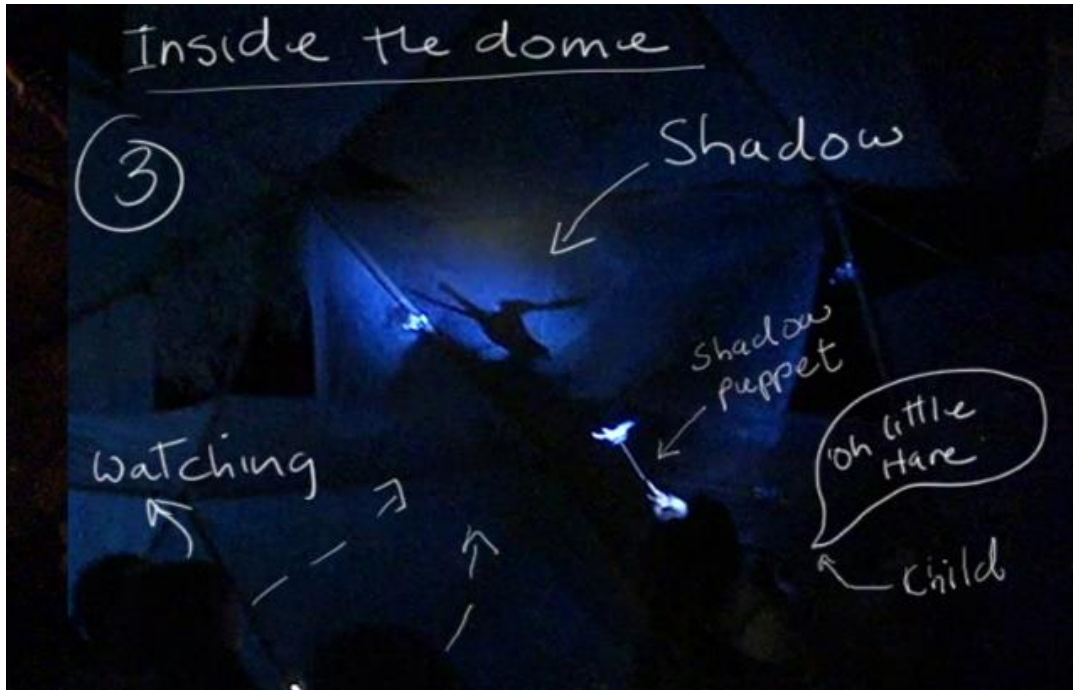


Figure 7-18 Shadow of a hare on the dome, Performance 5, vignette 7.1

None of the children expressed any fear when the lights went out; one child repeats “the light is dark” a few times, and Sophie responded to his concerns by giving him a light first. Throughout this scene, the outside of the dome is always lit up with moving lights operated by the children. When Sophie creates the shadow of the hare on the dome, PC24 responds immediately by singing her song ‘*Oh Little hare*’ to accompany the hare’s movements. Sophie repeated her song. PC23 demonstrated self-initiated action when she offered to help Sophie with the shadow play – she held the cut-out and Sophie the light resulting in a cooperative child-led interaction. This type of behaviour continued to the next scene where the children were observed to take more and more control over their experience.

7.2.5 The Giant Flower

Overview of Scene 5

The giant flower was the penultimate scene where the children discover the hare. The hare is hiding inside the flower, and the children could look into it on tiptoes. It was large enough for five children to look into the hole. The aim was to create tactile and haptic interactions with the tickle sensors, vibration sensors and the hard, fluffy and smooth material surfaces. Sophie or a child led the group out of the dome through the suspended discs and into the space of the giant flower (Figure 7-19). The grown-ups usually sat on the coloured mats surrounding the flower and the children either sat on or next to them, some approached the flower to investigate it. In a few instances, some children decided to visit another space, the dome or the tree.



Figure 7-19 The giant red flower

Grown-ups immediately brought them back. Sophie sometimes carried a large paper butterfly with her from the dome, and many children brought one or two small lights with them. They played with them during this scene, lighting up different things around them like the flower and the hare.

Sophie would usually tickle the tickle sensors at the bottom of the flower to demonstrate the interaction (Figure 7-20). Some children and grown-ups tickled the flower. She then often encouraged the children to open the flower petals; however, sometimes they initiated it without any suggestion. They would usually lean against the petals and on tiptoes look or put their arms into the hole at the centre of the flower and try and guess what is inside.



Figure 7-20 Participants settling into the final scene and observing the giant flower

7.2.5.1 Scene 5 Vignette 8 and 9

In the two selected performances, the children demonstrated different levels of involvement in finding the hare and spending more time playing with the hare (Figures 7-21, 7-22, 7-23). The third performance on Day 1 had six children and seven adults. It was the largest group of children we had, and the children ages ranged from 22 months to 3 years: PC10 – 2 years, five months, PC11 – 2 years, 6 months, PC 12 – 22 months, PC13 – 2 years and PC14 – 2 years, and PC15 – 3 years arrived at the end of Scene 1. Performance 5 took place on Day 2 and five children, mostly two-year-olds, and 6 adults attended. PC21 – 2 years, PC22 – 2 years, PC23 – 2 years, PC24 – 22 months and PC25 – 2 years who joined the group at the beginning Scene 3 in Performance 5 Day 2. In both performances, the children showed more confidence and initiative with interacting with the performer. The scenography and the grown-ups tended to stay back as in the vignette below.



Figure 7-21 Performance 3 Vignette 8.1

1) 'Say, I think the noise was coming from here, do you?' She reaches the flower with PC13 and kneels down and says 'what if we tickle these funny bits?' and leans over to touch the tickle sensor at the bottom of the giant closed flower. PC15 is close to her and has one hand on the flower, so does PC13 and PC14. A sound is heard - 'Oh!' says Sophie.

2) Sophie moves back in surprise, 'did you hear it?' she looks at PC13 with a big smile, pointing to the sensor at the bottom of the flower. 'You can give it a tickle if you want, tickle the fluffy bits'. PC15 bends down and tickles the flower; it makes a sound. Sophie "You did it!"

3) Sophie then touches the sensor again. PC12 now with her grown-up one side of the flower, points at the sensor. PC11 stands next to them, Sophie says "If you tickle these fluffy bits it will make a funny laugh".

4) PC14 is sitting down looking at the flower is encouraged by her grown-up to go up to the flower. She stands up and approaches the flower, then turns to her mother and says "funny laugh mummy."

(Performance 3, Vignette 8.1.)



Figure 7-22 Performance 3, Vignette 8.2

1) 'Oh, what's underneath, shall we?' says Sophie and puts her hand on the edge of one of the petals to open it, at the same time PC13 puts his hand under the petal and pulls another petal and opens it.

2) Sophie says 'well done what is that, what have you found?'. Simultaneously PC15, PC12 and PC14 open the other flower petals. 'Guys, really well done!' exclaims Sophie as she congratulates them. PC11 goes back to his grown-up's lap, PC15 moves forward, PC10 kneels down with his hand on the petal and takes it away. 'Oh, it is a beautiful flower!' says Sophie and PC15 leans against the flower on tiptoe trying to look into the middle. 'What's inside? What's in there?' questions Sophie. PC15 moves to her side and reaches into the flower with her right hand.

3) PC14 and PC12 are now near her looking serious. 'What can you see? What's going on in there?' 'What did you see, anything good?' Sophie asks PC15. She says 'a mouse!' Sophie replies 'A mouse, was there a little mouse in there?'. PC12 runs back to his grown-up's lap, and PC14 turns around to her mother and say 'Squeak, Squeak!'

(Performance 3, Vignette 8.2.)



1) PC22 and PC23 are now helping to open up the petals on the flower. PC21 is tickling the sensor. PC24 is pointing toward the dome.

2) PC21 joins in, and a child says 'a big one'. Sophie says 'is it like cake, scrumptious, delicious' as the three children continue to open up the petals. 'Does it smell like a nice flower?' PC23 puts her face into the hole in the middle of the flower. Sophie asks 'does it look nice?'. Sophie says 'What's in there?' trying to make her words sound like an echo.

3) 'What can you see?'. PC22 looks in and PC21 leans against the flower. PC23 moves to her grown-up and Sophie takes a look inside the flower and exclaims 'Oh my goodness!' 'You would not believe what I have seen.' PC24 looks at Sophie and moves towards her and laughs, then he continues to move over the fluffy cushion next to his growing up.

4) PC21 looks in, and Sophie says 'I have seen something cheeky in there?' PC21, Sophie and PC22 are all looking into the hole. 'A cat!' says PC21, Sophie asks 'a cat, is it?' 'Oh, shall I get that cat out?' PC21 turns to his grown-up and say 'A cat!'. PC22 walks across space and says 'mummy a cat.' Sophie says to everyone 'we think we have seen a cat!' (Performance 5, Vignette 9.1.)

Figure 7-23 Performance 5 Vignette 9.1

Sophie pretended that she did not know what made the funny noise and suggests the fluffy bits; this gives clear hints and direction to the children on what they could try and then demonstrates the interaction (Figure 7-22). In Performance 5, three of the children actively touched the tickle sensor. In Performance 3 (Figure 7-21), two children seemed interested in the flower sound; the rest of them were very close to it but were more anxious about opening the flower (Figure 7-23).

In both performances, the children worked together to open the flower petals. They were very anxious to see what was inside the flower and immediately after opening it, decide to look in the hole – one group thought they saw a mouse, the other a cat. The children did not wait; they were curious about what was in there and demonstrated self-initiative. A few of them looked into the hole at the same time and came back a few times to investigate. In Performance, 3 vignette 8.2 PC15 reaches into the flower and tries to reach down to get the object in the hole. In both performances (Figure 7-21), some children were vocal while others moved back and forth and shared their discoveries with their grown-ups. Sophie added to their excitement by asking them questions such as ‘What’s inside? What’s in there?’ or ‘What can you see?’ or saying ‘Oh my goodness!’ and ‘You would not believe what I have seen!’, their behaviour is exploratory, and they did not hesitate to go close to the flower and touch it.



Figure 7-24 Performance 3 Vignette 8.3

Sophie says, 'shall we look inside and see who is there?', 'Ooooh,' Sophie puts her hand into the flower and says 'OH! I know who is in here!' and the hare's face pops out, and Sophie animates his head to look around at everyone. 'Come on then, pop out he comes, oh what a lovely fellow!' and the hare comes out entirely and Sophie holds it in her hand. All the children are looking.

- 1) *Sophie animates the hare-like a puppet and asks, 'Have you been sleeping in there the whole time?' The hare nods yes 'Have you? Moreover, was it nice in there?' he nods, 'and did you hear us all about?'. He nods and 'you just stayed quiet?' he nods. 'You cheeky fellow, shall we give stroke?', 'tickle tickle' as she moves it to each child. 'He like tickles with his nose', she says. PC14 points her light on his nose and*
- 2) *Sophie says 'does he like your light?' Facing PC12, Sophie asks 'do you want to give him a tickle?' PC12 touches him, moves him to PC11 who put his light on the hare's nose and then to PC10 who is sitting on his grown-up's lap. He touches it. Sophie says 'Oh! Lovely he is so nice and soft, isn't he?' Then looks up and says, 'So now we have found my hare. We can do want ever we want in here!' (Figure 7-24) (Performance 3, Vignette 8.3.)*



Figure 7-25 Performance 5 Vignette 9.3

1) As Sophie says “eh” and puts her right arm into the flower all four children are looking, and Sophie says ‘Oh!, Oh! He is a funny fellow, oh, oh!’ However, as she pulls up the hare’s head out of the flower, PC21 stretches his arm out to grab the hare with the help of PC23 pulls him out of the flower.

2) Sophie says “Look! You are getting him!” and gently takes the hare from PC21 and hugs him and says “My hare, you cheeky fellow you have been hiding” and she strokes his face. PC21 has his two hands stretched out says

3) ‘I’ll have that; I will have that!’ Reaching to get the hare back. His mother touches his back to stop him. Sophie response by saying ‘Will you give him a tickle first, then everyone can and you will have him back’ He tickles his face.

4) Sophie moves it to PC23. PC21 say “I will have that!” Then she turns to his grown-up, who talks to him. Sophie passes the hare to PC22 “little tickle” and says “have a tickle, everyone can have a cuddle’, and passes the hare over to PC21 and says “you can give him a cuddle first!”, he takes the hare and hugs him and turns to his grown-up and sits on her lap and hugs it.

5) PC23 approaches him and wants the hare, his mother tries to convince him to give her a turn, he hugs it tighter, but then gets off his mum’s lap and gives it to PC23.

6) She stands opposite her grown-up and hugs it; then her adult prompts her to give PC22 a turn. (Performance 5, Vignette 9.3.)

The hare became a contentious object in Performance 5, but it took the children only a short time to understand turn-taking. The hare was very desirable, PC21 seemed to want it. It was the only performance where the children took an active part in pulling the hare out. Sophie skilfully got it back, but he was determined, and his mother mediated the situation. Sophie clearly understood his plea and clarified why she needed the hare but allowed him to tickle it first. With encouragement from his mother, he was able to practise turn-taking. Another child was also prompted by her mother to pass it on (Figure 7-25, image 6). Not wholly convinced there was nothing else in the flower, PC21 went back to look into the hole (Figure 7-23, image 6). In Performance 3, the children touched the hare rather than hugged it. Children used objects from other scenes, in particular the lights on the hare's nose. They proved to be very attractive as it brought children to the front (Figure 7-25, image 2). Sophie spent more time in Performance 5, animating the hare and asking him questions. The children were not as anxious to interact with it, so she had time. Sophie brought the hare to the children who remained near their grown-up. All the children stroked, touched or tickled the hare. Soon after Scene 5 ends and Scene 6– 'Open Play & Exploration' begins.

7.2.6 Open Play & Exploration

Scene 6

The free play and exploration session was an opportunity for the children and grown-ups to spend 15–20 minutes, exploring the four different performance spaces. This scene was included to enable the audience to revisit the spaces and follow their interests and fascinations. It encourages participation and play between parents and children. It allows everyone to try things out. Most groups chose to move into different spaces. However, one group continued to follow Sophie for the first five to ten minutes. The grown-ups tended to support the children. Some children stayed close to Sophie and wanted to play with her. The three children who remained with their grown-ups throughout the structured performance were now happy to explore and run around the performance space without parents. Some parent just stood back and let their children investigate. Parents sometimes helped to mediate the

children's disputes over desirable play objects. Many of the grown-ups took the opportunity to play and try out the different interactive objects. The small objects tended to be moved around by all the children depending on their preferences. Sometimes groups formed naturally at different spaces, and one child or a few children became the focus. At the end of the performance, objects were found all around the performance space.

The tree was a very popular area, and many children chose to go back there first. Some parents alerted the children to the hidden mirrors around the tree. The grown-ups talked to the tree and showed their children how sounds affected the actual colour. A child said hello into a funnel hanging off the tree, and their grown-up followed them. One grown-up and child stomped around the tree to light it up. The funnels and hoses are like loose parts and were used in many different ways. One parent put a feather into it and blew into the hose, and the feather flew up into the air. Children were seen walking around the performance space with a funnel around their mouth, making sounds. Children used it over their eyes like a telescope and over their ears to listen. Children talked, sang and shouted into them. With a two-sided funnel construction, children talked into one side with a grown-up listening at the other. A child was observed laughing when a grown-up said 'ooh' into the funnel. It was used to talk to the hare. A little light was used under them to light up inside the dome. The funnel afforded a variety of play and constructions. The children found them engaging and attractive, and this meant the tree was continually being activated and lit up.

The suspended objects, like the string curtain around the tree and the discs hanging in front of the dome, became a source for tactile and sensory play. Children hit, pulled and detached the discs. Some enjoyed moving or running through the string curtains and in Performance 3, one little boy squealed with laughter when running through them.

Some children created their own play spaces, especially in the dome. Children brought the fluffy cushions into the dome and made a play space with the hare and

sang their favourite songs like *Jump Little Bunnies* and *Twinkle Twinkle Little Star*. One child was seen moving in and out of the dome as if playing a game and her grown-up looked on. The parents would go into the dome with children to make shadows or light up the dome with different coloured lights. Sophie sometimes made shadows inside the dome and children followed them on the outside. Sophie also showed children who were not confident to create shadows. Parents would play with the discs, butterflies or lights with their children.

The audience revisits the musical meadow, and the sounds augmented the play space. Some children played with their grown-up, and they sometimes showed the children where to step or touch to trigger the sound. Children jumped around mounds with the performer, adults playing on it alone. Some of them were curious about how it worked. Children and Sophie brought the hare to jump on the mounds. Others just used it to rest by sitting or lying on it. One parent made shadows of the hare on the meadow. Like the small object, the boats got moved around and used in various places. A child was noticed rolling a boat on his hand to light it up.

The giant flower remained open, and the tickle sensors are infrequently used. Children, however, were seen walking around and touching the various parts and looking into the hole. Some children put the hare back into the hole and reenacted the scene with Sophie or another grown-up. One child playing hide and seek under the petals. The fluffy cushions around the flower were popular, and children would sit or lie on them, or hug them and walk around with them. Others moved them to a specific place like the meadow or dome. Some younger children were noticed collecting the small items and putting them into a basket. In Performance 6, a child carried the basket out of the dome then took all the things out, sat down and played a game – taking the little lights in and out of the basket. A grown-up interrupted her play by putting the rabbit cut-outs in the same basket. She promptly took them out and continued her play. After an allotted time, the performer gathers the group and asks for help putting the hare to sleep.

Sophie says 'it is time for us to take our bunny back, he is looking a bit tired now. I think it is time to take him back. Can we all get ready to go back to the other room now; can you take him back now?' A child responds by saying 'come on everybody'. Sophie says 'time to go, this way' looking at a child she says to her 'you bring my lovely hare.'

As they exit the room, they follow the line on the floor through the corridor and into the foyer to the meeting room. Most children, with the help of their grown-ups, leave all the playthings and follow Sophie to the meeting room. However, a few children needed more convincing, for instance in first performance one child did not want to leave, and his father successfully helped him perform a familiar departure ritual by saying 'Let's say goodbye to the tree.' (Performance 3, scene 6.)

7.2.7 Nite, Nite Little Hare

Overview of Scene 7

Nite, nite little hare, is the final scene, putting the hare to sleep becomes a device to bring the children back to the meeting room. It is a concise scene; the children are led out of the performance studio by following the line to the meeting room, with their grown-ups in hand. Sophie sits on the floor; the children usually sit around the suitcase some walk around or stand near their grown-ups. Sophie usually opens the suitcase, or a child helps her. Then she asks the children to help her put the hare to sleep.

7.2.7.1 Scene 7 Vignette 10

The vignette below had children from a mixed age group. Only one vignette is presented as the scene is concise, and all were very similar. The third performance on Day 1 had children ranging from 22 months to 3 years: PC10 – 2 years, five months, PC11 – 2 years, six months, PC12 – 22 months, PC13 – 2 years, PC14 – 2 years and PC15 – 3 years. It is an example where many of the children take the lead in the action. (Figure 7-26.)

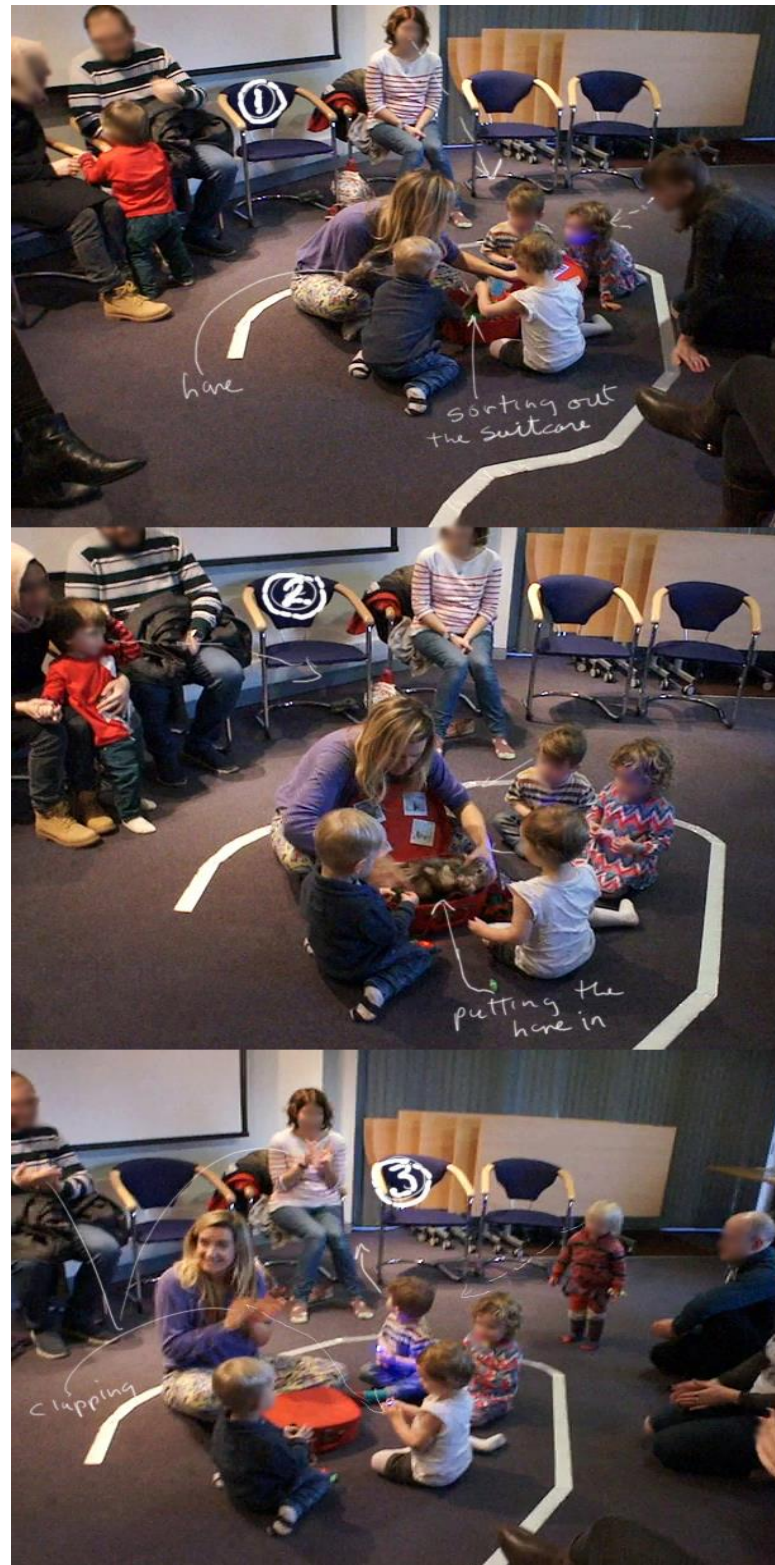


Figure 7-26 Nite, nite little hare, it's time to say saying goodbye

- 1) *Sophie has the hare in her hands, and three of the six children sit around her, and one says 'we sit down again.' Sophie says 'can I just tell you,' Sophie looks around the room and says 'my hare was pleased to meet you all, and now it is time to go to bed. So, we will open his special box, my special bag?' She turns the bag around and then says, 'let's turn it around, so you can all see' a child says 'special bag.' Two of the children reach into the bag when Sophie says 'let's take all the gubbins out; then we can fit him in.*
- 2) *'He likes to curl up into a little ball.' 'Oh nice', and Sophie puts him into the bag, then asked the children. 'Shall we put this flower in? That is nice and soft' she says, picking it up. 'Let's say night', and the children lean over to see the hare and say 'night' and Sophie says 'goodbye' and puts the small tree model into the suitcase and starts to close the lid. All the children are looking; then she says 'shall we put the butterfly in' picking up the butterfly 'and what about the snake?' A child takes it from her hand and says 'No!' 'Anything else to go in here,' A child says 'Shh!' and points to the lid and Sophie slowly closes it.*
- 3) *Then Sophie says 'can you give yourself a great big clap for being so brilliant.' Everyone claps. 'You have helped we find my hare, we did a good job,' she says as she pushes the red suitcase under the chair. 'Thank You!' The performance ends, and the children in the middle of the room move towards their grown-ups. (Figure 7-26) (Performance 3, Vignette 10.1.)*

This scene is quiet and calming; the children who participated in putting the hare in the suitcase decided on what to put into the suitcase and were fully engaged in the act. It is a familiar ritual for them, and they seem to enjoy doing it, and it was a very natural end to the performance. Many of them had invested in the story, for instance, when a child said 'shh!' and indicated it is time to close the lid.

After clapping, we asked parents about the balance of storytelling, and open play and all parents agreed that it was the right balance. Some parents mentioned that their children too young to follow the story.

7.3 Findings and Discussion

Overall, the audience seemed to enjoy the performances, and it created a space for children to explore, move, experiment and collaborate. The performer demonstrated a playful attitude and tried to respond to children's interactions. Most of the parents who returned the post-show survey felt that during the show most of the children were curious, active, joyful and fascinated, however, few felt that their children were sometimes restless and distracted and one confused. The next section, I discuss the findings and include the reflections and the voices of the parents and the performer when relevant.

7.3.1 Arrival and Departures

Beginnings and ending/hellos and goodbyes are necessary rituals. However, they can sometimes be seen as mundane and ordinary, just part of an audience process of coming to a performance. However, these transitional spaces and moments are essential instructional events that should be considered as part of the whole performance and not as separate from it. The ritual of greeting and ritual of departure helps audiences to orientate themselves to leave, especially younger audiences. They can act as 'access rituals' (Goffman, in Kendon 2009, p.206). *'Greetings mark a transition to increase access and farewells to a state of decreased access'* (Goffman, in (Knapp *et al.*, 1972, p. 5). The greeting ritual acknowledges an audience presence, helps them to construct their relationship with the performer and understand the role they may play in the performance. It allows them time to relax and get familiar with the place and the group. While the departing or leaving ritual allows the young audience time to detach from an encounter slowly. Familiar and more direct cues can help them if they find leave-taking difficulty.

Beginnings – First Impressions

In the first scene, the performer established a feedback loop with the audience through direct communication, maintaining eye contact, focusing her attention on each child and speaking to them with enthusiasm. The performer's introduction of herself is usually done with open arms when she said her name she smiled and put both arms on her chest, 'I am Sophie' then she asked each child their name looking directly at them smiling. This direct greeting acknowledges the child's presence to the group – they are now not an anonymous audience member. If they attend a nursery or an earlier group, it was a familiar ritual. This greeting was also supported by the space – a neutral/less theatrical space seems to have a positive effect. One parent that brought two children said: 'They are always a little shy in a new environment (one more than the other), so it took them a while to get comfortable.' Another parent said 'At the beginning of the show my son was quite sleepy and a bit grumpy, he didn't want to engage and was shy. It does normally take him five minutes or so to get used to the new class/group. However, he was quite active and curious for the rest of the performance.'

Like adults, children need time to settle, and beginnings provide the time and allow them to get familiar with the performer and the performance. In a post-performance interview, Sophie discusses the value of the meeting room as a transition space and the benefits it brought to herself, the audience and narrative.

I think the meeting room helped with the transition of going into the bigger space because they knew me; they knew I was part of the performance we made. I was able to explain to them ... Whereas if we did not have that meeting room and we had gone straight into the big space. My fear would have been that there's so much to take in that it would have been hard to focus attention on a narrative. I doubt they would have grasped the story at all. The teeny tiny ones, the little ones would not be able to understand the story because that would have flown over their head. I enjoyed meeting them also. And I think for the same reason you know they were able to get a sense of me as a human being. I was someone

that they could feel safe around and that their parents treated me as someone safe to be around so they could start to feel more relaxed around me and then obviously to follow me through a very unusual space in the next room with would have been less daunting. (Interview transcription.)

Sophie's account reflects points that have to do with the location, the greeting and intimacy of the first scene and the question of how it could help young children grasp narrative. One mother who missed the first scene said to us 'My child was fascinated once she had a few minutes to calm down, we were late and missed the storytelling at the beginning, which is a shame as I think she would have benefited from that.' It may be reasonable to suppose that the effect of the first impressions could be seen from the second scene as most children interacted with the objects on offer.

Endings – Last Impressions

Saying goodbye and leaving a play activity can be difficult, especially for some children, so how can a performance help the young audience to depart effectively? Goffman felt there is symmetry in the relationship between the arrival and departure rituals (Goffman, in Kendon, 1990, pp 206). They both play a role in helping the audience increase or decrease access to an event. The departure ritual in theatre is symbolised by clapping and light changes to the stage and the audience. The meeting room was used again and became the departure space. Making leaving part of the performance seemed to work and in performance three one child, even helped to call the audience. Parents/carers played a part by enacting their leaving ritual.

Overall, these findings provide support for using greetings in TEY and reveal how they can affect children's levels of interaction. Arrival and Departure rituals are not new or unique; they are part of our everyday culture. A few early years theatre companies have recognised their intrinsic value. I saw its effect in performance by Oily Cart, Magic Acorns and despite their value in engaging young children, greetings, and their role in shaping interactional events in TEY are rarely a focus of study.

7.3.2 Rules of Engagement

Creating the experience for a flexible environment that allows the audience to respond and interact, but only when they feel ready to do so, is not always straightforward. There are many factors to consider in highly interactive performance, and theatre-makers should not expect all audiences – children or grown-ups – to understand the convention of interactive theatre.

Engaging the audience means to help them to understand their role and for them to become familiar with our rules of engagement. In TEY, an adult interpretation of these rules can affect the child. We devised a physical action that could help both grown-ups and children understand the nature of the performance. Taking off shoes was a sign of freedom to play and is familiar to young children as it is usually a requirement at soft play centres. Giving access to objects by being offered them was another sign of open interaction, which some children worked out. One parent said ‘She was a bit shy at the start, but got into it after 10 minutes or so, once she worked out that she could play with things.’ Another parent wrote ‘I think my daughter felt from the beginning that this was a child-led piece and responding accordingly. The performer was warm and inviting, and our little girl was keen to play throughout’ (Appendix 4, post-show survey).

However, not leaving anything to chance, we were explicit about the rules of engagement to the adults. ‘Theatrical competence’ or understanding of theatre conventions may differ, and inevitably, it would be some children’s first experience. So at the end of Scene 1, Sophie explained our child-led philosophy. It means for the grown-up; they were not always in charge of what happens. They could participate in the awareness of the performance being a child-led experience. Every child is an individual; they bring with them their preferences and some may find the theatre experience daunting and not exciting (Wood and Grant 1997, p.21). Understanding this challenge can help the audience have a more meaningful experience (Maguire, 2012, p. 11). In some incidents, Sophie not only reassured the parent and child but helped them understand the rules of engagement. For instance, in the second

performance, a child got a bit distressed when the flower is seen in Scene 1. Sophie acknowledged this and reassured the child and her mother that it was okay not to smell the flower and shut it away in the suitcase. The young girl did not display any signs of distress during the rest of the performance. The performer demonstrated empathy and sensitivity to the child's reactions.

The grown-ups can play an essential role in supporting and encouraging a child to engage. However, it is not always that simple, as adults also come with their expectations. There were a few incidents where parents intervened by redirecting or brought back a child who strayed away from the current scene. Some children were determined and pointed to where they wanted to go, as seen in vignette 9.1. One particular child did this several times in a few scenes and was redirected, suggesting our child-led approach was not understood by some adult audiences, and their expectations of a flexible performance may be different. Children responded in the way that the performance allowed, but their actions were directly affected by the adults. In such cases, there seems to be a conflict between the value place on the performance as opposed to the child-led activity. Perhaps the cultural and pedagogical value of the performance weighs more than the child-led play activity. Alternatively, maybe our invitation to participate was too ambiguous and created an uncertainty in the adult audience as one parent commented.

I think the role of the parents could have been better defined. I was not sure if I should intervene and help my child use the various props or to keep out of the way. Some sort of briefing of that nature might help parents help their children make the most of the interactive nature of the experience.

Another parent was not sure about objects and said '*maybe it was a little unclear whether we needed to keep hold of the little things from area to area. I was worried we would leave something and then not get the most out of the next space.*' (Question 4.8. Appendix 4, Post survey shows.)

These findings raise two questions about rules of participation in TEY – how best to help audiences 'get' what we expect of them and how different adults engage with

the invitation to participate. These findings not only reveal the ambivalence faced by parents/carers about the best way to support their children's play by interacting or standing back but also reflect on the broader debates around flexibility and creativity in a child's space. Finding the right balance between a performance that has structure and allows agency and the role that the adults can play in nurturing or scaffolding children's experiences is difficult.

7.3.3 The Young Audience

The children demonstrated their engagement or interest in many different modes. As the children's confidence grew, they so did their willingness to interact with the scenography and the performer. Some children were keen to share their experiences with their grown-ups, and others looked for their parents' approval before interacting. For them, it may be how they reconnect or get reassurance from their parents. We observed this behaviour throughout the performance as well as in the previous study. It demonstrated how different groups of children interact and reveals that although they seem confident to lead their play, they still require their grown-up's feedback, attention or approval.

From the start, the audience became co-collaborators in the performance tasked with helping to find the hare—children's understanding and ability to follow the narrative varied and was age-dependent. The story and journey were fixed, and Sophie only made minor changes during the performances. Children's personality and behaviours varied. For instance, during Scene 1 PC21, a two-year-old boy was always moving from the chair to the floor, but at each stage when Sophie asked a question, he responded and seemed to have considered what she said. His restless behaviour did not seem to impede his attention. Perhaps the performer's acknowledgements also encouraged him to continue reacting. His meaning-making was evident. Probably his mother's support, the performer's responses and the relaxed nature of the performance contributed to his sense of agency and freedom of expression. However, some parents found that their children were too young to grasp the story and others with older children felt there could be more storytelling. One parent

commented: ‘During the storytelling sections my daughter was engaged... As a 2.5-year-old who goes to the nursery, I think she was expecting more storytelling, and when she realised that it was over, it was her cue to leave’ (Question 4, Appendix 4, post-survey shows). One of the predicaments theatre-makers face is the variety in audience ages. An 18-month-old child is very different from a 36-month-old child. Being aware of this issue, we hoped that the openness to play during the performances would allow each child to experience it on their terms. However, maybe there was more that can be done to find the right balance to help younger children. A parent suggested that for younger children touching and seeing the hare in Scene 1 may have helped, and another felt that giving the children pictures of the hare to hold could help them remember whom they are looking for the hare.

The connection between the performance and children sometimes went beyond the theatre walls. In the following examples, children took their temporal and spatial experience of the performance in their play. One parent describes her little girl’s reenactment:

She loved the tree the most and still talks about pulling the feathers out most days. We came home and used the puppet show theatre she got for Christmas to show her daddy what happened. She found a teddy rabbit and was re-enacting bits that she remembered: the feathers, the lights, singing row your boat, and bouncing on the grass. She has seen feathers since and without prompting, relates them to the tree. So this was inspiring for her!

Another child experience demonstrates how an object helped recall her experience.

We were making sensory bottles at a group, and she picked up the feathers, blew them and said ‘rabbit’ and ‘show.’ (Question 4.5, Appendix 4, Post-show survey.)

Nine parents wrote about incidences of their children’s play that they felt was as a result of the performance. Their comments refer to children making gestures of a

hare, playing hide and seek games like the hare, recounting the performance after they were asked about it, searching for sounds, singing a song or being more receptive to shadow puppetry. These comments reveal how the theatrical experience might manifest outside of the boundaries of the performance space and have an effect on some young children's play by encouraging, recounting and imitating.

7.3.4 The Performer

Sophie has a great deal of experience with this age group, and this was noticeable in her actions and interactions. She focused on the interrelationship of gestures and spoken words, direct eye contact, and positioning herself at the children's levels by sitting on the floor. She tried to respond to the children sensitively and was alert and sometimes paused mid-sentence in response to a child's question – one-to-one focus when necessary. She imitated them, and they imitated her. For the children who stayed close to their grown-up, she brought the objects to them. This sensitivity, respect and awareness of children's needs are not easy in a live situation. Sophie reflects below on the difficulty of communicating and how easy it is to miss children's actions.

As a performer working in this kind of method, you have to have someone who is just uber aware of what's going on, which is difficult, really difficult because I mean, yeah, I worked for so long with little ones and I still catch myself missing, missing stuff with certain children. Moreover, so in this type of theatre if you have a child who is more extrovert than another one and is more is happier to communicate with you. It is entirely possible that a more introverted child would miss out because they were slightly less demanding or content just to let the action happen around them and it might be that they miss out unless you are very aware of making sure that everyone gets what he or she needs from the performance. However, the other thing is as a performer; you have to be aware of the different needs of each child. In a way that would be enjoyable for them would heighten their experience. So, um. So that is quite a big ask of a performer.

I think it takes someone acutely aware of the little one's needs or kind of has a high level of emotional intelligence or can have much empathy.

(Interview transcript.)

Sophie's invitation to participate builds on 'empathy and emotional intelligence'. She gradually builds up children's confidence and involvement through directly talking to them and helping them interact with the object and feel safe. However, some children may be happy not interacting with the performer or the objects, and this can be difficult to work out in a live performance. Sophie extended the invitation to participate by focusing on the language of participation, discussed in the next section.

7.3.4.1 The Language of 'Us'

In the role of a storyteller, facilitator and narrator, the performer's language plays a role in engaging the audience. Sophie focused on open-ended questions and the language of participation by using words such as 'we' to create the impression of a collective group. For instance, she said 'well, if we have not got my hare here...', 'The magic tree, we should go to the magic tree together', 'We can make the tree a funny colour, should we do some jumps near the tree?' It can contribute to an audience feeling that they are a part of the performance and implicated in the actions as insiders and experience the story close up. With the opened questions such as 'Ugh, I do not know where my hare is, shall I ask the tree? Shall we have a look?' Sophie was rhetorical. She did not expect an answer, and most of the children did not give her one. The rhetorical questions were used to draw the child's attention to an object and make them think about what she was about to do. Their answerers would not have changed her actions, but they allude to a sense of participation. However, some children listened and answered, for instance, in vignette 2.3, when Sophie pointed to the pictures on the inside of the suitcase and a child answered.

Sophie's experiences and strategies demonstrate how the performer plays an important role not only as of the performer but as the facilitator and storyteller. The next section considers the relationship between the audience and the performance

and the constraints and opportunities encountered in the interactive, flexible environment.

7.3.5 Please Touch

The interactive promenade

The interactive promenade format immersed the audience in the scenography and permitted individual interactions to happen within a scene. The journey and scenes remain constant; the audience participation did not affect the outcomes of the story. The interactive nature of the performance was welcomed by the grown-ups that attended, even though some tensions existed about their role as discussed in the previous section.

The scenography surrounded an audience and helped them feel as if they were part of the story. One parent said ‘I like that the participants were “on the set” if it makes sense, we were inside of the story’ (Question 3, Appendix 4, Post survey shows). The feeling of being ‘inside the story’ is like being immersed; there was no separate stage. The action could take place anywhere. As a result, there were usually interactions happening in parallel between various groups in the audience. Parents described the performances as ‘loose structure’, ‘child-led’, ‘joining in’, ‘part of the production’ and ‘few boundaries.’ One parent commented: ‘I loved the interactive nature of the performance and that F... was able to join in and move around as he wanted. It is refreshing when we do something with few boundaries. It is lovely to see children truly able to explore their environment freely.’ Another said, ‘It was so nice that they could touch and play with everything around them’ (Question 3, Appendix 4, Post-show survey).

At the beginning of each scene, everyone’s attention was usually focused on the performer. Still, as the performance progressed, we witnessed a shift- the simultaneous play between parent and child, child and object, and performer and audience occurred. The relaxed nature of the performance and ‘few boundaries’ engender both the group and individual activities and reveal how different levels of interactions can take place within one scene. In a situation where the storytelling and

the audience interactions happen in parallel, there is a possibility that parts of the story would be lost. The story did not have a complicated plot, and we valued the diversity in play and the sense of agency that was evident in younger audiences. The balance between the structured, flexible performance and the open play scene, worked well as it suited many different personalities. For instance, PC26 is three and had been to a few theatre performances; her mother commented that she was always restless in them. So the relaxed nature of this performance suited her, and she was able to express herself and explore. Most of the adults felt that there was a good balance between storytelling and play. However, some tensions existed with this flexible structure as some children were just happy to watch.

One parent wrote when asked about her child's behaviour during the show: 'Interested in what was happening, but it took quite a lot of encouragement for her to engage without my lead. She would have been quite happy to sit with me watching the proceedings' (Question 3, Appendix 4, Post-show survey). This parent's experience demonstrates how the invitation to participate became the anxiety to participate. We aimed to provide a structure to support all children and parents. However, the performance was biased to child-led interaction, and this parent felt the need to encourage it. The challenge is how to create the right atmosphere, so the audience – children and adults, think they have the agency to interact or not interact.

Very young children usually like to move about and sitting still in a performance situation is difficult for them. So promenade format suited this age group. The limited audience numbers played a part in facilitating a higher-quality interaction between the performer and the young audience. Smaller groups can help younger children feel more comfortable to explore. Parents felt it allowed their children to have the space to move.

The group was small, so my son had space and time to explore if he wished to. The performance was interacting and free-flowing; it was engaging and fun. (Question 3, Appendix 4, Post-show survey.)

However, an audience of five children is not economical for a professional touring production. It was adequate in this research project, and an audience of eight may still retain the quality of interaction. However, the larger the group, the higher the compromise to the quality of participation and relationship between the young audience and performer. Finding the right balance between audience numbers and an economic model is problematic and a critical issue that interactive TEY faces.

The promenade format worked on many levels, but it was still a structured performance and, for a few children, it was less successful in engaging them physically than the open play. For some, the open play was the only time they freely engaged – running around, playing with the objects. They became co-players in the space with their grown-up and the performer.

The audiences experience raises questions about the boundaries between structure and agency. The examples reflect on the notions of the experience economy and discourse about the value and the presumption that the ‘active audience’ is somewhat better than the ‘passive’ audience (Reason, 2015).

7.4 Design Affordance & Recommendations

The interactive scenography consisted of a series of interactive enchanted objects that enabled the audience and performer to control embedded lights and sounds, using different multisensory and embodied interactions. The novel design and the way the performer interacted with it afforded a sense of curiosity and playfulness. The primary role of the interactive scenography was to augment the story in each scene. The digital scenography interactions are categorised as intentional acts performed with a purpose and unintentional acts performed without purpose. Much of the intentional interactions happened at the beginning of each scene led by the performer and during the open play led by the audience. However, fewer children intentionally played with the interactive scenography during the scenes. The unintentional acts were performed throughout the entire performance. They were a natural result of the design and created a sense of randomness in the performance. As the ebb and flow of the sounds generated from playful interaction close to the tree

activated its lights, it seemed to be in constant dialogue with the audience. While shifting and walking on the meadow, triggered the sounds augmented the scene. During the performances, most children played with smaller objects like the boats, feathers, funnels, butterflies and lights, which were often carried from scene to scene. Like adults, many children were seen using interactive scenography during the open play. Not everyone found the interactive scenography as intuitive and visceral as the objects like the butterfly. One parent commented, 'Tech-driven interactivity did not seem as good, reactive or self-explanatory as interacting with materials: Even as an adult, I felt the texture of the butterflies more responsive than other parts of the show' (Question 4.6, Appendix 4, Post-show survey). When designing interactive scenography, I hope that it connects with the audience of both children and adults. However, one of the most critical factors in performance is time to learn, understand, and interface-action and reaction times are short. Sometimes it is not enough to have a fully functioning prototype. They need extensive playing within the situation to work out what requires adjusting and modifying, as discussed in the next section.

7.4.1 The Tree

The lights in the tree afforded the performer and audience various multisensory playful interactions, from using their voice to full embodied action, like running or jumping to make sounds. It provided the performer with her special effects cueing system. She was able to pace each scene and control the effects of lights sounds by initiate the scenography. In an interview, she said

What was useful was feeling that I had some control over initiating cues. Because I suppose that is unusual in a performance. So during one performance, we might be in an area five minutes, and then the following time we would be in there 15 minutes before moving on. So it was nice to have you had a sense of how everyone was responding to an area and then being able to cue, the cue to get here. That was lovely.... (Interview transcript.)

The tree was very popular with both children and adult audience. Maybe the atmospheric space and unique scenography and objects contributed to their

engagement. When parents were asked to describe their children's behaviour, they mentioned the tree 'Once she got into it, she loved it, especially the feathers and the things around the tree.' Another commented that '...the tree, in particular, seemed to spark her interest!' (Appendix 4 post-show survey.) While another said, 'My three-year-old has mentioned it a couple of times in particular blowing feathers and the tree that lit up' (Appendix 4 post-show survey). Most of the children decided to go back to the tree during the open play session. However, three children could not wait and chose to go there during other scenes in the performance. Children played with feathers while some spoke and made sounds with the funnels around their mouths. Some directly looked at the tree; others did not. There were various interactions with the funnel. Making sounds in the funnel is a sensory experience – the sound distorts, as the warmth of your breath is felt, and the funnel gets misty. The physical affordance of the design allowed children to hold, connect and move it around. This meant that they were not only used to talk into but when two funnels were attached to either end of a hose, it became a listening device for communication between a child and parent, performer and child and the hare and child. Through adapting, playing and changing the objects, the connecting and transformation play patterns come into play as the loose parts join together. The intention of the funnels was as a bridge between the physical and digital. Whether each child recognised or understood the effects of sound to trigger the lights is difficult to verify. The interface seems to have afforded older children (three years) quicker recognition of the cause and effect than the younger children. During the free play session, some parents were observed explaining the effect of the sound to activate the lights. Does it matter if they interpret it correctly? Maybe it does not; it is plausible to assume that the funnel afforded the oral communication required for the tree and whether the lights were activated intentionally or unintentionally, the audience benefited from the atmosphere and the effects it created.

Nevertheless, even though the children found it an entertaining space, the results demonstrate that the interaction design could be improved. For instance, some children found it was difficult to access some of the funnels on the tree trunk as it

was too high. They were not easy to reach without adult help, so greater access could be made by adding interactive lights and funnels on the rock at the bottom of the tree. Also, a higher contrast of coloured lights will make the effects more obvious.

7.4.2 The Musical Meadow

The musical meadow was a reactive environment for multiple participants; it involved physical engagement and embodied play and sought input from the audience through touching, pressing, jumping, rolling to create the polyphonic soundscape.

Like the tree, the performer gave the context for the interaction and the children performed within that context. The children and the performer were the first on the musical meadow the performer usually made the first sound and children imitated her. Before activating a sound, she left some time for the child to find the sound first, and on a few occasions, they did but often did not realise what they did. We found that children initially did not want to step on the daisy mounds, which identified where the sensors were located to activate the sounds. Sophie realised this and reassured them. Once they understood they could step on the daisies, then they were able to trigger the sounds, and it was easier to confirm that children understood their actions were causing a more direct effect compared with the tree.

The mounds and the flowers were too subtle and did not seem to draw the audience's attention or invite them to interact like the tree; more apparent clues were required for natural interactions. One solution is to go back to the separate sound pads used in *Into the Woods*. Stepping stones or an archipelago like the design could identify the different areas and afford the action of jumping. However, this could have the danger of becoming like a large button and not intuitively afford embodied actions like rolling or unintentional interaction. Thus, they become more interface-driven than performative and body driven (Salter, 2010). With more time to explore the meadows, the children may have found the interactive mounds. However, the findings suggest that in a performance setting where discovery time is limited, the scenography required more visual affordances.

The sound created an intermittent soundscape of animals and environmental sounds. These sometimes are repeated by children and used by the performer. Some children recognised the male voice as the hare's voice that said various statements like 'Hello! Can you find me?' The performer sometimes tried to orchestrate sound through group interaction by asking everyone to activate/press a mound at the same time. In the final performance (6) PC25 (three years old) used the embedded sounds to amplify her experience throughout the scene and during the open play. Some of the sensors were programmed to activate the randomised sound, and this added to PC25's play as she did not know what sound to expect. In retrospect, during the open play, the sounds should have changed to funny, celebratory or more instrumental sounds when the children found the hare, the sound of the hare's questions becomes redundant.

The 3D printed boats were small interactive objects which worked well and were liked by both the adults and the children. All children understood the simple interface of rolling the boat to light it up, they would usually scrutinise them, and one child rolled one on his hand. They were moved from scene to scene with the children. However, these could be further developed in the future with different sizes and interactions to create a different way to play.

7.4.3 The Shadow Dome

The shadow dome was the only fully enclosed space in the design and provided a contrast to the other spaces. The darkness and the size of the dome created a more intimate space. The children enjoyed going into it and playing with the shadows, using the cardboard cut-out on a stick worked well, but could be improved by attaching the lights to the same stick (a parent suggestion) which would allow the children to use them more independently of the adults. During the open-ended play, many children and their grown-ups played in the space, making shadows or playing with the object they brought from other scenes. The dome's structure is easy to install and will suit a touring performance, and there is potential to develop interactive experiences further using light sensors.

7.4.4 The Giant Flower

The giant flower was the third digitally enhanced scenography piece. It was a short scene, and most of the interaction happened around the flower. The scale of the flower added to the aesthetics of the overall performance. It is a curious object, and the various textures attracted the children. It allowed for group participation as the children often helped open it. It was the perfect size for the children; most of them could tiptoe and see inside. By this stage, the children had some small objects from the previous scenes, and some of them used the little lights from the dome to light up the flower and the hare. The hare was the highlight of this scene, and the children enjoyed playing with it. They took it to all the scenes during the open-ended play scene and interacting with it; every child touched or cuddled it, confirming children's affiliation with animals.

Like the other interactive scenography, Sophie demonstrated the interactive elements. Many children tried out the tickle sensor at the bottom of the flower and laughed at the funny sound. The small vibrators on the inside of the flower did not seem to have any effect on the children; they were too subtle to be noticed even when pointed out. The petals were large, and when open, they covered up the interactive tickle sensor and unfortunately this meant that they were not visible to the children all the time. In the open-ended play scene, the flower remained open, and the children hid the hare in it and re-enacted Scene 5. However, the tickle sensors remained hidden and as a result, were not often used. The interactive digital element served its purpose within the performance and afforded different haptic interaction, but for more interactive play, the sensors would have been better placed in the middle of the open flower

One of the main limitations of *The Runaway Hare* was its relatively short trial period, for testing of the interactive scenography and technologies used. More evidence of long-term stability and reliability of the hardware and software used was required for any uptake by theatre professionals. Fortunately, several opportunities arose

after my presentation of *The Runaway Hare* performance to a TEY network gathering organised by Polka Theatre, London (March 2017) as discussed in the next section.

7.5 Technology Transfer

Opportunities to design and test the stability of some of the technologies used in *The Runaway Hare* transpired between 2017 and 2019. Firstly, the sensor floor designed for the musical meadow mat was used in several projects. Secondly an opportunity to design *The Enchanted Forest* installation (Figure 8-1), for the opening of Theatre Hullabaloo's new children's theatre venue.

7.5.1 The Sensor Floor

The sensor floor used in *The Runaway Hare* proved exceptionally robust and flexible. It was used several times in 2018 and 2019 for installations at an early years mother and babies group at Quad, Derby, and a Sense charity Family Day at Newstead Abbey. As part of a Magic Acorn East Commission, it was installed at three early years nurseries in Yarmouth, Norwich and Somerset and two early years installations at the Time and Tide Museum (Great Yarmouth) and Norwich Castle (see Figures 7-27 and 7-28). The force sensors are stitched onto the surface of the hessian fabric, which makes it easy to transport and install.

Designing for reuse means the possibilities of a more sustainable and affordable system. However, there are two current limitations in the design. The first is the fixed position of the sensors that restricts the design of mat or fabric covering sensors because it needs to be aligned to the sensor positions. This proved difficult in some the small spaces, for instance, at the Time and Tide Museum (Figure 7-27).



Figure 7-27 Sensor floor, Time and Tide Museum, Great Yarmouth, 2018 (Acorn East Network)

A modular system with individual sensors would be more flexible. It would facilitate more choices in the position and number of sensors. The second limitation was the small surface area of the sensor when hidden; it was a challenge to identify the 5 cm square space for activating the sound.



Figure 7-28 Sensor floor, Norwich Castle Keep, Norwich, 2018 (Acorn East Network)

Nevertheless, this was a fun game for some children. How would an entire interactive space work for a more extended period with more audience over a long period? This will be discussed next.

7.5.2 The Enchanted Forest

The Enchanted Forest installation was a chance not only to extend some of the concepts and learning from the previous two performances but to test the technologies for a more extended period. The installation was made in collaboration with the Mixed Reality Lab (MRL) and was designed and built in the Lab between 1st August and 11th December 2017. A small team including a creative technologist, a composer and prop makers, helped to facilitate and extend some of the initial ideas and ambitions for the installation. The practical aspects, such as safe housing the microprocessor boards, were part of the overall design strategy. Eight lily pads were designed, drawing from the stepping stones ideas from *Into the Woods*, and the sensor floor mat was made the same way as in *The Runaway Hare* and proved to be quite a stable platform.

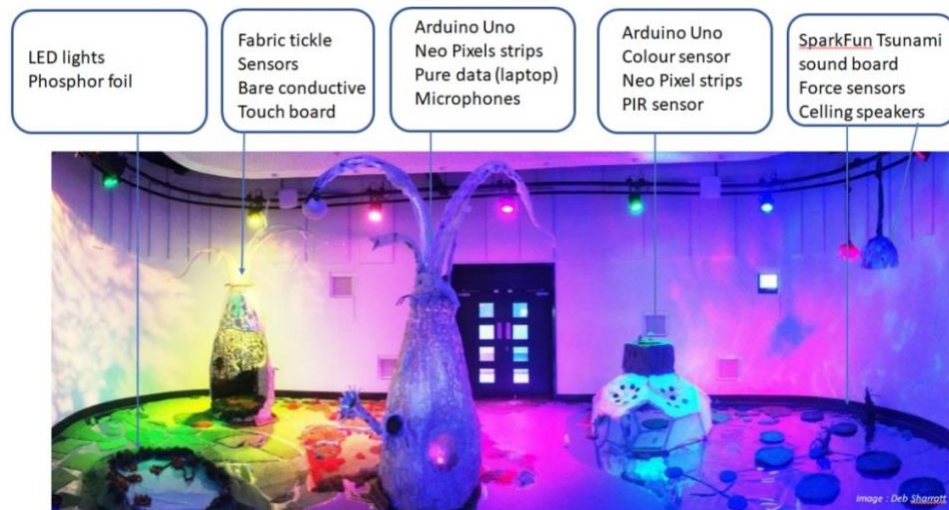


Figure 7-29 *The Enchanted Forest* in the Creative play space at Theatre Hullaballoo

The small force sensors were placed under the centre of the lily pads, and this worked well for *The Enchanted Forest* because most of the time, visitors jumped in the middle. However, when no sounds were heard, some of the visitors explored by jumping around lily pad to find the right position. Ceiling speakers were embedded in large

hanging felt flowers to locate the sound in the vicinity of the lily pads. The tickle sensors idea from the giant flower was used in the conductive felted flowers that activated stories of fairies in story tree. As with the magic tree, sound was used to activate the lights in the large tree at the centre of the installation. This experience was further developed so that the audience voices echoed around the room through the surround sound speakers. New design features included a small size dome where lights changed colours when coloured leaves were fed to a frog and a fairy lagoon using a smart material that reacts to light.

The installation had over 6,000 visitors and ran for five months, six days a week and then toured to the Polka Theatre, London for the *Technotopia* Festival, May 2018. It reopened at Theatre Hullabaloo for five months on March 2019 and on its closure in November 2019 a total of 17,747 visitors had attended.

In the first month of the installation (2017), a few small technical issues were experienced and were rectified within a day. However, it proved to be a stable system that consisted of a variety of affordable, digital DIY technologies. One parent blog review stated:

'It is an amazing feast for your senses. As an adult, I loved it, so relaxing in it... It is like stepping into the pages of a children's book. You can create a tune on lily pads, hear your words echoed out after being funnelled through a tree, feed a frog to change colours, draw with light, relax in a story tree and listen to stories literally at the touch of a material button...' (Sharratt, 2017.)

The Enchanted Forest is included at end of this chapter because it was a natural progression from *The Runaway Hare* and *Into the Woods* research and provides a good use case and evidence for a functioning interactive system for scenography over a longer period in a professional theatre setting with a large number of visitors.

7.6 Conclusion

This chapter has highlighted that the current interactive system has a high potential to make scenography more interactive, and the early indications point to an interest by the early year's theatre community and audiences. *The Runaway Hare* and *The Enchanted Forest* data demonstrate that the interaction and tangible scenography was robust and reliable over an extended period.

The Runaway Hare study presented in this chapter enabled me to evaluate and test interactive scenography with children in a live performance. The performance illustrates how to incorporate children multisensory play into an interactive promenade performance. The audience behaviour revealed different needs. For some children, it was their first experience of theatre. There is a need to pay attention to the fact that not all children are interested in interacting. Provisions must be made to allow them and their adults to feel comfortable and not pressured to interact. Clear rules of engagement can go some way in helping the audience to understand the provisions of the performance. The adults are crucial players when parents or carers know these rules, they can help scaffold their children's experiences. Providing small objects for handling increase interactivity and engagement. The objects linked the scenes as they were taken from one scene to the next by the audience and helped to focus the attention of some of the youngest children. The integration of open-ended play scene within the promenade-led performance increased the audience sense of control and agency. In the end, control is shared between the audience and the performer.

The interactive scenography directly enhances the audience experience and affords various sensory interactions only possible through interactive scenography. Audiences were able to control in real-time, lights with their voices and sound through touch and whole-body interactions. For the audiences to have a more spontaneous experience, the scenography interface has to be intuitive, bright and bold. There is little time to learn during the performance, so the audience engagement relied partially on the performer facilitating the initial interactions in

each scene. However, with more time to freely explore the audience required less facilitation and stimulated opportunities for play during the open-ended play scene.

Interactive scenography comes with many possibilities that can impact on the audience experience and behaviour. Most scenography is usually static; the work undertaken demonstrates how affordable DIY technologies can enhance and make scenography more interactive. In the end, the technologies used have proven to be stable and reliable with constant use over one year with a broad audience. It is only by understanding why and how TEY audience behaves can the scenographer best integrate interaction into a performance or installation. While there is still much to learn, the research findings outline thus far points to future possibilities and approaches to interactive scenography are discussed in the next chapter.

Chapter 8 INTERACTIVE TEY

The work presented is concerned with making interactive scenography for theatre for the early years (TEY). It explores the affordances of digital technologies to create interactivity and participative performance. The performances represent how children can play an active role in interactive scenographic spaces that are less rigid, more open and responsive. It also explores the role adults can play in scaffolding children's theatre experiences. Furthermore, it examines how interactive and multisensory scenography accommodates a child-centred (open) approach to play and how early years research and practices are resources for design. The findings demonstrated the design process and approach to making performance installations and how technology can be considered as a material for making scenography more dynamic. In this chapter, I will first discuss and outline the elements of an interactive TEY model for designing interactive scenography and performance and then discuss the findings in relation to the scenography and performance including the performer and audience role in participation and interaction.

8.1 Interactive TEY model

The interactive TEY model focuses on the affordances of scenography. The model is split into four activities that can work in parallel, Scenographic Paradigm, Technologies for Participation, Spatial Configuration and Transitional Spaces as illustrated in Figure 8-1. It differs from other models as it makes a more explicit connection with early childhood research and theories and draws on the findings of the two performance and installation models outlined in the previous chapters. The previous TEY models by Nagel and Hovik 'Interactive Dramaturgies' and Fletcher - Watson 'SceSam working Model' discussed in chapter two, emphasised audience participation and respect for children's rights which overlap with the TEY model.

The interactive TEY model consists of four areas of activity. Each activity has multiple tasks, and there may be several iterations of each task. Each of the four areas in Figure 8-1 below can work in parallel. The model supports a scenographer's practices and is used in addition to it.

The model covers three main areas: the design and creation of the interactive scenography, the configuration of the performance space, and engagement with the audience. The model aims to explore the challenges and opportunities to make the performance interactive and audience centred. It focuses on the activities within the usual process of making a performance or installation, such as the design, build, rehearsal/testing and installation phases.

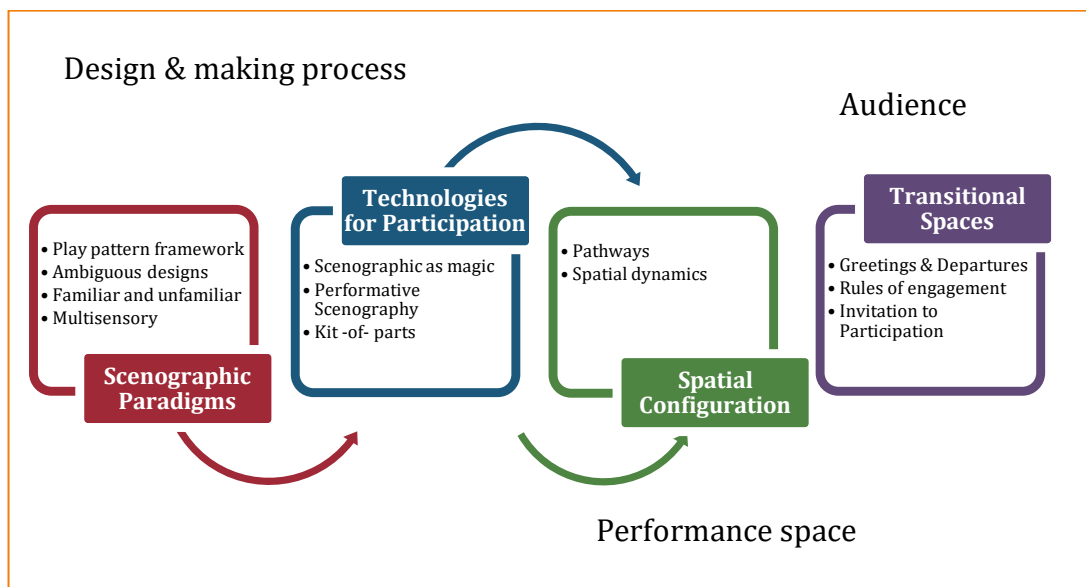


Figure 8-1 Summary of the interactive TEY Model, with four elements – Scenographic Paradigm, Technologies for Participation, Scenographic Configuration, Transitional Spaces. The elements inform each other and should happen in parallel. The first three activities affect the creation of scenography, and the final one connects to the performance elements.

The general guidelines for using the TEY model are to start with **Scenographic Paradigms**; then once there are one or a few scenographic ideas consider the **Technologies for Participation** and analyse how they can work with the narrative/theme and spatial configuration. The process is fluid, so the scenographic objects/ideas may change due to the technologies, interactions or narrative. The time

spent on exploration is dependent on individual project constraints such as deadlines and budgets. Once the designs and narrative are confirmed, then the process of building and developing the final scenography and technology system follows alongside the rehearsals. The spatial configuration and the transitional spaces are developed and confirmed during rehearsals or alongside the build and user testing phases in case of designing an installation only.

8.1.1 Scenographic Paradigm

The scenographic paradigm is part of the studio design process and consists of incorporating one or more of these four areas:

Play pattern framework

Ambiguous designs

Familiar & unfamiliar

Multisensory

The purpose of this activity is to develop the design through repeated prototype iteration and sketches to deliver a scenographic solution based on the purpose, theme or narrative of the project. At the beginning of any design process, the scenographer responds to the performance space, text/theme and audience. However, when adding audience interactivity and participation in the performance or installation, these relationships can be challenging, and the fundamental distinctions no longer hold: ‘everything depends upon how the material is used when it operates as a medium’ (Dewey, 1980, p. 66). All four areas in this phase overlap and involve the artist/scenographer 1) actively analysing how the design/ideas can be incorporated from one or more of the four areas, 2) exploring how the design promotes audience interactions, 3) delivering a design rationale which includes sketches, models and prototypes, 4) building the scenography.

8.1.1.1 Play Patterns

Through the play pattern framework, the scenography is extended and reconfigured to generate more complex object designs and interactions that are used for

interaction and play (Figure 8-2). The play pattern design framework can offer children new experiences that they can explore and that suit their underpinning instinctual interest. Parents attending both performances reported that they observed these patterns regularly in their children's play. Each play pattern represents a naturally occurring behaviour in children that can afford the designer/theatre-maker a specific way of thinking about and extending ideas for design in theatre/design or HCI. The results presented in the two performances are encouraging. As a creative tool, the play patterns gave structure. They shaped both the generative (create ideas starting with a play pattern) and interpretive (consider the play pattern after initial design ideas) design process.

TRAJECTORY up and down and along and back, drawing vertical lines, throwing, jumping up & down	ROTATION things that rotate, turning round and round, rotating objects, spinning	CONNECTING linking things together in various ways and forms, 'cutting', 'sticking', 'joining'	TRANSFORMING explore and see change, explore malleable materials
ENCLOSURE boundaries, space, shape, size, measure and capacity and possibly, imaginative play.	CONTAINING covering , putting objects in containers, 'disappeared', peek-a-boo, hide seek,, burying or digging objects	TRANSPORTING moving things about in different ways, from place to place, 'forwards', 'backwards', 'under', 'near' and 'far'.	POSTIONING positioning items in lines, rows or by size, different types of lines, size, grouping, pattern, sequencing and counting

Figure 8-2 Eight Play Patterns/Schemas.

Thinking with children's natural behaviours at the forefront helped to explore, reflect, and acknowledge shifts in the design strategies and solution. Moreover, the play patterns relate to core design principles regarding form, function and the behaviour of an object. The patterns applied to the scenography were apparent in the children's interactions, and additional patterns not considered in the original designs were observed (Chapter 5, Table 5). There are opportunities offered by multiple,

overlapping play patterns (designed and experienced), and that was one of the reasons for the suspended discs being the most popular item. The results demonstrated how a combination of patterns that support a logical sequence of actions work well together. For example, creating variation in the suspended discs helped the child participants re-appropriate, reinvent and construct them to suit their ideas and stories (Chapter 5, vignettes 1 & 2). However, the discs are an ambiguous design, and that may also have affected their popularity. However, the magic tree in *The Runaway Hare* was a recognisable object, and it was the most popular space, incorporating several patterns in the design, such as transformation, connection and enclosure. The various scenographic objects that incorporated play patterns do not just invite interaction; they can also shape how the audience make meaning and construct their experiences.

The play pattern framework presents a new approach to design for TEY beyond its original purpose to analyse (rather than design for) the children's play. However, some limitations exist firstly as a design tool, and it does not directly address multisensory interactions. Secondly, as an analytical tool, it was much easier to observe patterns in children during the open-ended play than during the more structured scenes in *The Runaway Hare*. However, as a creative tool, it was successful and resulted in inspiring different perceptions and ways of thinking through to develop interactive scenography.

8.1.1.2 Ambiguous Forms

The ambiguous form of the suspended discs in *Into the Woods* led to a more open design; they varied in size and had different textures. The young audiences used them to perform, to wear, and in various imaginative ways – play cannot relate with correct use. For example, in vignette 1 and 2 (Chapter 5), we did not conceive of the object being worn, but when the child put her head into the hole in the disc, became part of her, like a collar. On another occasion, she wore the disc and became a passenger on an imaginary train. She demonstrated her ability to be a divergent thinker (White, 2012) when she came up with new ideas and novel ways of using the disc. Ambiguity in the design freed the object from a fixed-function from the start and opened it up

to the audience imagination, permitting a wider variety of interpretation and interaction (Gaver, Beaver and Benford, 2003). This feature is found in popular children's toys such as blocks and Lego. Children make meaning through thinking and speech and the dynamic relationship with the object, people and the world around them (Vygotsky, 2004).

8.1.1.3 The Familiar and Unfamiliar

The familiar seems to allow children to enter into an experience with some knowledge, so when the unfamiliar is experienced, it can help facilitate imagination, curiosity and play. This occurred through the familiar narrative, for example, hide and seek or everyday situations and through objects, for instance, the fruits that made sounds. However, when the familiar object becomes defamiliarised, it makes the object evocative (Turkle, 2007), the familiar object becomes curious as it performs differently or the materials used look unusual. For instance, the tree was the most popular area in *The Runaway Hare*, – it is recognisable as a tree, but made from Sellotape and plastic wrap drawing attention to its textures and material. It behaves familiarly through the kinetic light; sounds are interactional. It creates a communication flow between the audience and the tree. Using a bricolage way of working, by pairing objects in an unusual way, such as the funnel and the hose – kitchen and industrial objects – the 'unexpected' with the familiar encourages 'richer' experiences, sustained interest and more reflection from children (Rogers *et al.*, 2002). Novelty facilitates curiosity, the unexpected and can create acts that surprise. Research in museums has shown that children will explore and manipulate novel objects to find out how they work (White, 2012). Using different size objects can create novelty. For instance, the giant flower was the height of an average two-year-old. Children were inquisitive about opening the petals and looking inside in both vignette 8.2 and 9.2 (Chapter 7). In *Into the Woods* children were also drawn to the small puppets with LED eyes. However, the way the performer's behaviour can affect children's levels of exploration cannot be underestimated. Sophie (performer) always acted surprised and curious when she found an object. In both performances when an object was shown incidentally or demonstrated playfully, this led to more

exploration by young children (aged two to three years) than when the functions were demonstrated pedagogically (Shneidman *et al.*, 2016). Incongruence in design can create a sense of surprise and amusement (Ludden, Schifferstein and Hekkert, 2012). It occurs when an object's properties are not what is expected, for instance, a fake rock that looks heavy but is light and made from paper, the fruit in *Into the Woods* demonstrated sensory incongruence (visual-auditory) mismatch between objects for instance fruits trigger sounds. The children were not scared by it, and adults found it highly amusing. However, specific conditions are required for humour; if the fruit were plastic, not real, then it is not as amusing because the material is artificial and perceived as easily changeable (Ludden, Schifferstein and Hekkert, 2012). Also, the musical meadow in *The Runaway Hare* is made from a carpet which is artificial and the hidden property – sound – was engaging and surprising but not funny as it may have been if it was real grass. The material features of an object that is familiar or unfamiliar and novelty and incongruence can all extend interactive play, engagement, surprise and humour.

8.1.1.4 Multisensory

When designing for the senses, considering the performance design as a multimodal experience is beneficial. Multiple senses can be designed to interact; for instance, sounds triggered lights (visual) on the tree. In contrast, touch (tactual) and movement (kinaesthetic) triggered sounds (auditory) on the meadow and flowers and stepping stones through what Salter (2015) refers to as the 'technologies of the senses' ordinary objects with behaviours that make them extraordinary (Salter, 2010a, p. 193).

Touch

The sense of touch played a significant role in the interactive design, both practically through the choice of child-friendly materials and aesthetically. The design was not just a matter of touching an object but about providing different haptic experiences through materials that were soft, hard, cold, warm, rough and smooth. Touch is not a lesser sense; the haptic sense often acts as the standard by which the perceptual

system learns how to combine different senses (Helbig and Ernst, 2008, p. 244). Visual information can be affected by touching an object with different surface qualities, for instance, smooth or rough. Touch can bring things alive ‘making them speak’ – a living system (Katz, 1989). For instance, the flower in *The Runaway Hare* used the tickle sensors to activate the funny sounds. The touch with movement, the use of short strokes and the tips of the fingers – it is furry so can relate to familiar soft toys – and the sound of laughter also contributed to making it seem alive.

In contrast, the musical fruits in *Into the Woods* were hard, and the audience static touch-tapped and grasped them. There is a difference in the tactual perception (softness, shape and texture) between touching, tapping hard fruits and stroking a soft fabric; they both triggered sounds. However, haptic interaction was dependent on tactile material properties. Undoubtedly providing a range of textures and material can help stimulate different aesthetic experiences.

Sound

Interactive sound can play a role in introducing the narrative, and vocal repetition of digital sounds resulted in children having a deeper relationship and connection with particular sounds. Vygotsky found that using a physical object helps very young children to pretend play (Vygotsky, 2004). However, what the object represents, in reality, does not seem to matter for symbolic play to occur. In *Into the Woods* in vignette 1 (Chapter 5), demonstrates how the transformation schema with sound can play a role in the imaginative and symbolic play. The sound transforms the avocado into a door knocker (performer) and the melon into a baby (child, aged 18 months). In this call and response game, the child’s encounter with the performer further enriched his experience by connecting the sound to an original narrative as the sound took precedence over the material object. It also occurred in *The Runaway Hare* in Vignette 6.1 with a girl (aged 36 months) who connected the sound to the narrative, the sound of the hare’s voice or duck in vignettes, however overall the older children seem to make the narrative link with the sound faster than the younger children. The position of the speakers made a difference; children seemed to be aware of the

direction of the sound. The closer the sound is to the scenography, the higher the sense of authenticity and illusion that it is coming from that object. If not close, some children will look for the source of the sound, even when it was out of sight. Materials such as the cellophane butterflies made a crackling sound when squeezed and were very popular with the children in *The Runaway Hare*.

Smell

The sense of smell posed particular issues. Scents can remain within an enclosed space for a long time, and there was no time in between performances to neutralise the scent in the theatre space. The solution was to include it in small self-contained areas, for instance, on material inside the giant red flower or in small boxes that had daisy flower scent (olfactory). Hence it did not play a significant role. Therefore, more research is required to develop ways for the scenography to include scent in a more imaginative and novel way while at the same time, keeping it contained.

The interactive scenography functions like an instrument, waiting to be played by the audience and the performer. Their act of interplay becomes the means for improvisation, and a means to enter into dialogue with the scenography. The meaning of the open object is in flux but is dependent on the flexibility of physical and interactional properties set by the author. Scenography that is ambiguous, familiar, novel, tactile, multisensory and incongruent can go some way in facilitating further exploration, and playful interactions form audiences.

While the design paradigms investigated the physical scenography, working in parallel is the technologies for participation which is explored next.

8.1.2 Technologies for Participation

This section explores creative approaches to embedding technology that augments performance and facilitates alternative ways to interact with digital content and its effects. An interactive performance or installation needs to have a reliable and stable technology system and an interaction rationale that considers the narrative/theme and audience behaviour. In order to fulfil, these three areas are identified as:

Scenographic as magic

Performative Scenography

Kit-of-Parts (Technology System)

As in the previous section iteration and prototyping is part of the process of testing and developing the audience interaction: 1) exploring the various technology options available (Kit-of-Parts) within the constraints of the project, 2) actively analysing how the technological element (i.e. sensors) can create a sense of magic and be performative, 3) investigate the potential audience interaction, 4) deliver an interaction rationale including how the technology system will be installed and run during the live performance/installation, 5) build the system.

8.1.2.1 Scenography as Magic

Theatre is magic from the dance of the shaman to the spectacle on the West End stage. It creates illusions and stage magic that fuel an audience's emotions and imagination. Mechanical technologies have been utilised since the Renaissance, and contemporary theatres have the full digital infrastructure and stage controls for the sound, special effects, video projections and lighting (Baugh, 2013). Magic is rife in children's literature and film; it creates a sense of wonder, pleasure, mystery, secret and fuels the imagination. Like the magic lanterns on the Victorian stage and in the drawing-room (Hunt, 2008) open-source hardware and sensor technologies can continue this tradition by transforming scenography into new objects of wonder; albeit on a smaller scale. Magical thinking is about impossible objects; it can enhance creative and divergent thinking in children. Four- to six-year-old British children's creative thinking was enhanced after looking at film clips with magical characters and events (Subbotsky, 2014). However, this research was carried out with older children and results may differ from children under four, but it points to the effect of magical thinking that goes beyond stories and fantasies. Nevertheless, enchanting scenography with interactive technologies means, unlike books or films, theatre is live. Children can become the conjurers, exercising their agency, controlling the magical effects live and up close.

8.1.2.2 Scenography as Performative

The interactive scenography can be orchestrated live by the performers and audiences rather than on cue by a stage manager. Drawing on musical improvisation as a metaphor, I argue that the performative aspects of the embedded technologies in scenography can help audience improvise. Interactive scenography blurred the material and digital boundaries; the object seems ordinary on the surface but is like an instrument waiting to perform. Its coded behaviours are programmed onto microcontrollers to create real-time/live levels of interactivity and degrees of intensity. In this sense, it is not a free improvisation; there are some set criteria or structures. For instance, the magic tree in *The Runaway Hare* housed two microphones inside the trunk which were programmed to pick up a full range of sound. Any loud sounds near the tree triggered a spontaneous generation of lights that moved vertically up the trunk, following the dynamic rhythm of the sounds. The improvisation was in the level of the sound made by the audience. The lights moved up and down, and colours changed, creating a sense of spontaneity added to the live aesthetics. In essence, it was performing like an instrument. However, due to this nuance, some younger children did not seem to recognise what caused the effects, as the light changes were moving too fast. However, once understood, they could intentionally improvise by jumping or making sounds with live responses. Blowing and making vocal utterances into the novel objects like the funnels facilitated distortion sound making.

Similarly, the meadows accommodated improvisation by the combined sound effects with an embodied performance that had direct force and energy: jumping, rolling, stamping, stepping, pressing and hitting the mound. On being activated, the unfolding sounds of animals and natural elements produced a storified soundscape rather than a musical one. The sounds were programmed to play randomly; there was no fixed order. In these respects, the behaviour of the scenographic objects is performative, like an instrument waiting for acts of participation. The audience (as the performers) actions become a meaningful part of the performance.

8.1.2.3 Technical System – Kit-of-parts

There was no one best technology solution, determining how and what technologies are transferable and adaptable for scenography in a TEY situation that is both physically and economically challenging, is one of the aims of this research. Using an iterative process, audience responses and live testing have led to the development of an interactive system, a kit-of-parts (see Table 8-1). It consists of small microcontrollers and sensors that allow for interventions and manipulations of the senses in several distinctive ways to activate lights and sounds, and soft circuits that use conductive theatre and wearable microcontrollers. From the evidence of *The Enchanted Forest* installation, the technologies used are flexible, affordable, and reliable and can work within a professional TEY environment. However, they do require open engagement, collaboration and experimentation by theatre artists and makers with the technologies.

Into the Woods was an experimental stage of testing the technological integration in scenography. It was elementary, and some elements were unstable; for instance, the sound mats and fruits did not always work and needed resetting a few times in the short performance. The scenography was experimental, not fixed, and the older children's (three- to four-year-olds) curiosity led them to explore how it worked, they looked under the stepping stones and unplugged and re-plugged the cables into the fruits (vignette 6, Chapter 5).

Their experience moved from one of magic to exploration that resulted in the form of deconstruction, learning through a kind of reverse engineering. However, it was not what I set out to do. Making space for direct creative learning is worth exploring, but it was not within the scope of this research project. If a system lags, then the user loses the direct real-time experience, no delays in the feedback allow for a free flow of actions and reactions (Krueger, 2002). The second performance *The Runaway Hare* produced a more reliable system than *Into the Woods*. It extended some of the core interaction design ideas from the first performance, discussed in Chapters 6 and 7. The six performances proved to be a good indication of the potential of utilising affordable open-source hardware and software in a performance setting for children.

The interactive sounds and lights transformed the traditional scenographic space and objects into a magical, performative and aesthetic space for both the children and adults.

The findings revealed that temporal aspects of performance could affect children's responses. The promenade performance had limitations of interaction time. The youngest children encountered issues with immediate recognition of cause and effect with some of the scenographic objects and required more instructions. The scenography needed more direct and bolder affordances for faster recognition. For instance, if the tree in *The Runaway Hare* had a higher contrast, moving from dimly lit to colourful and bright, this may have afforded quicker recognition. They were possibly adjusting the sensitivity of the microphone to allow only loud sounds. However, this meant that the natural improvisation of light with sounds was lost in the scene. Perhaps a louder sound could be programmed to a particular colour. These possible solutions evidence the openness of an interactive system to allow adjusting parameters to suit an audience.

Scenography	IW	RH	EN	Hardware	Software	Features	Functionality
Meadow		X		Wav Trigger	Free cross-platform GUI application to specify different playback functions.	●Polyphonic audio player ●Play Simultaneously stereo tracks ●tracks upload onto a MicroSD card ●16 programmable sensors inputs	Robust and reliable
Lilly Pads			X	Spark Fun & Robertsonic			Scalable props or scenography
Fruits	X			Touch Board	None required	●Monophonic audio single track ●Capacitive sense anything conductive- metal thread, fruit and vegetables ●Upload mp3 tracks to a micro SD card	Robust and reliable
Giant Flower		X		Bare conductive soundboard	Arduino IDE for more complex feature, i.e. proximity sensing		Scalable props or scenography
Story Tree			X				
Tree -heart of the forest			X	Arduino Uno (AU)	Free cross-platform Arduino IDE software	●Microcontroller board ●The physical programmable circuit board ●Control products and devices ●Attached LEDs and sensors etc	Robust and reliable
Frog			X				
Meadow		X	X	Force sensors	Microcontroller compatible	●Measure force between surfaces	Robust and reliable
Lilly Pads							Thin
Frog Lair			X	Colour sensor	Microcontroller compatible	●Detects the colour of an object	Robust and reliable
Puppets	X			Conductive	Microcontroller compatible	●Cotton or polyester thread with meta incorporated. For sewing circuit boards LEDs or sensors	Robust and reliable
Giant Flower		X	X	thread & fabric			Scalable props, costume scenography
Story Tree							
Tree -heart of the forest			X	Microphones	Microcontroller compatible	●Capture voice and sounds for activating LEDs etc	Robust and reliable Costume, props
Magic Tree		X		FLORA Adafruit	Arduino-compatible microcontroller	●Wearable electronics ●Sewable	Robust and reliable Costume, scenography
Puppets	X			Sewable LEDs	With or without Microcontroller	●Hand washable ●Sewable	Robust and reliable Costume, props.

Table 8-1 TEY Kit -of -Parts used in *Into the Woods* (IW). *The Runaway Hare* (RH) and *The Enchanted Forest* (EN)

8.1.3 Spatial Configuration

In the design of an interactive installation, more so for a promenade performance, how the scenographic objects are configured in the space can help the narrative flow and how the audience engages with space. It is essential to focus on the movement and journey of the audience. The role of an interactive performance/installation space is to evoke a sense of a place (forest, underwater, etc.), curiosity, surprise, immersive atmosphere and support the audience and the performer's activities. The physical configuration of the space is a critical aspect to consider when creating an interactive space. These two features can aid in this area:

Dynamic spaces

Pathways

These can be applied during the design process at each stage when some of the objects have been designed, and the scenographer needs to 1) explore the relationship of the physical space to scenography, 2) consider the audience journey at each stage, 3) consider how it fits in with the theme and narrative, 4) what environmental stimuli can attract audiences.

8.1.3.1 Dynamic Spaces

Dynamic spaces are the relationship between the scenographic space and the audience. In all the performances and installations designed for this research, the space is open plan. The audience can see the entire space.

Within the open-plan space, there were four to six different distinct areas with interactive experiences. The areas were partitioned using light, hanging objects like string curtains and the suspended discs, creating soft boundaries. The suspended scenography were kinetic objects that moved and attracted an audience's attention; they were not static and created a playing space for the imagination.

In *The Runaway Hare*, some of the spaces were designed for different spatial dynamics and embodied experiences. The play pattern is linked with children's behaviour and how they play with objects and can be useful to consider in the

relationship with the spatial design. For instance, the magic tree represents the verticality – looking up at the magic tree, the feathers and butterflies in the air and the light moving up and down. In contrast, the meadow focuses on the horizontal – looking down, touching the textures of the carpet and flowers and moving boats along a line. Additionally, the dome is connected with roundness, enclosed space, surrounding dark entity, like the night sky – the audience lights up space with circles of light. Equally important was the giant flower, which was about looking, revealing a hidden space that created a sense of surprise and curiosity deep inside the flower.

In addition to light creating a boundary space, coloured lights can create an atmosphere that can help define an area and have the power to make the experience of a space more immersive. However, younger children can potentially be scared.

8.1.3.2 Pathways

The scenography of the in-between space is central to promenade performances. In *The Runaway Hare*, narrow pathways snaked through the spaces, inside and outside of the performance space. The scenography pathways are like a network linking audience between scenes, and the inside and outside of spaces to create a continuous scenographic space. It created a perceptual relationship to the spaces, so the entire experience was a journey. Space is perceived as a whole, even when it was partitioned. The audience is not just walking through the foyer; they are following a line, playing a game. Their movements and jumps embodied the curves, dashes and straight line on the floor, with a skip and a hop. Architects sometimes design pathways using the same material on the thresholds between inside and outside; this visually links the spaces (Berleant, 1991). Pathways create a perceptual engagement that encourages connection between the spaces and our ‘sensory imagination’ links to ‘sensory awareness’ (Berleant, 1991). The performer used the pathways to move the narrative on and to indicate the next mysterious space. Some children noticed them, and at other times, parents indicated them (vignette 6.1). These are fun features in a design that allowed various kinesthesia and visual experiences; the children and adults seem to enjoy following them by moving up, down and around them.

8.1.4 Transitional Spaces

Transitional spaces are in-between spaces that are used to help the audience perception and experience of an interactive performance. They play a significant role in TEY because they can facilitate the performer/audience introduction, create a sense of audience trust, link in between scenes and provide an understanding of the interaction between the audience, performer and space i.e.:

Greetings

Rules of engagement

Invitation to participation

These three activities occur during the installation or performance. They are essential to help empower the audience to engage. These three areas can be integrated creatively in any performance and should make sense to the audience: 1) how is each area situated in the narrative? 2) has enough time been given at each transition point? 3) does each area acknowledge the differences and respect the audience?

8.1.4.1 Greetings & Departures

The greeting ritual acknowledges the presence of the audience and helps them to construct their relationship with the performer and understand the role they could play in the performance. Welcoming audiences in a neutral space such as the meeting room or a theatre foyer allows them time to relax and become familiar with the environment and the other audience members (strangers) in a typical lit environment. Props also play an integral role in this process as they offer an opportunity to interact as discussed and evidence in both performances some children required more time to settle in before interacting.

Departure rituals are not new or unique; they are part of our everyday culture, and many children's activities and nurseries frequently use them. A few early years theatre companies have recognised their intrinsic value for young audiences (Brown, 2012). Equally important is that the departing or leaving ritual allows the young audience time to detach from an encounter slowly. Familiar and more direct

cues help them if they find leaving difficult. Moving out of the main performance area for the final scene in performance two was successful. Making the leaving ritual part of the overall narrative added a new dimension to the performance; for instance, the children helped to put Hare to sleep, symbolising the play had ended. Sensitivity and empathy for a child in a new environment can go a long way in helping them relax (Fawcett, 2009). These transitional spaces and moments are essential instructional events that should be carefully considered and developed as part of the whole performance and not as separate from it.

8.1.4.2 Rules of Engagement

Rules of engagement allow an adult audience to understand the boundaries set by the performance and in so doing gives them more agency to act. Creating an experience of a flexible environment that allows the audience to respond and interact, but only when they feel ready to do so is not always straightforward. In *The Runaway Hare* performances, more parents required a clearer understanding of the rules of engagement. Parents' confusion about the rules correlates with observations in other interactive TEY performances (Young, 2012). The theatre is a social institution with its own rules or 'structure' where different types of theatre will have different levels of audience agency/interaction. For instance, in pantomime, it is commonly understood that the audience is free to exert their agency by directly communicating with the actors on stage, as opposed to a traditional play or opera. There are many factors to consider in a highly interactive performance, and theatre-makers should not expect all audiences – children or grown-ups – to understand the convention of interactive theatre. In Giddens' concept of the 'duality of structure,' structure and agency are dependent. In this relationship, knowledge becomes the foundation of which the agents (audience) understand and modify the rules (Giddens, 1979). Therefore, in a TEY performance, 'structure' or the rules of engagement need to be explicit (White, 2011) and clearly explained to the adults/parents. Hence, they become 'knowledgeable' agents with the capability to act. However, each adult/parent will have their own guiding rules about how their children should change behaviour, and this may be contrary to some of the rules set

out in the performance. As a result, theatre-makers will need to be empathetic and open to different parenting styles.

8.1.4.3 Invitation to Participation

TEY practitioners are influenced by children's abilities, rights to participate, and participatory practices in post-dramatic theatre, live and performance art (Pinkert, 2009; Fletcher-Watson, 2016; Hovik, 2018). Many performances are participatory, and practitioners adopt an experimental approach. The primary objective is to understand that the value of interactive and participatory performance is found in paying attention to how audiences play, and interactions are negotiated, established, and maintained in the performance by and amongst all the players; the children, adults (carers/parents), performers and the scenography. For instance, the question of whether all children should interact is put aside in favour of how children act and what can we learn when we invite them to participate. An interactive performance does not mean that the audience will naturally participate or enjoy the activities. It is vital to recognise that some children will not be interested in interacting, while others require more time to relax and that parents have different predispositions to play.

The next section discusses the finding and implication of scenography and performance.

8.2 Scenography and Performance

The sensors and technologies in scenography extend its expressive form and dramaturgical potential to create a sense of liveness in the object. The scenographic object gains a sense of agency in being interactive. The scenography moves from privileging the visual to displacing it, through haptic and multisensory interactivities. The traditional relationship between the audience and scenography is displaced as they both gain agency. In this sense, it is still theatre, not installation art as the performative actions create a dynamic relationship with the scenography. The traditional theatre space is now deconstructed. The findings (Chapters 5 and 7)

demonstrate that this relationship can move the audience to become active players and, in some cases, lead the play while the scenography becomes performative. For instance, in vignette 2 (Chapter 5) one child sees a scenographic object then chooses to play with it and a second child sees the first child's actions, is compelled to play and can imitate, re-iterate or alter the original object (vignette 2). The children's active engagement with the scenography and space is the ultimate stage in the creative process. The audience and the performer can be seen to collaborate with the scenographer in doing the work. How this concept works differently depending on the level of openness and interactivity in a performance is discussed next.

Into the Woods was an open-ended, experimental improvised performance that allowed audiences the freedom to engage and to interact and play on their own terms. There was no text or directions for interacting with the audience, 'no centre'. The performers became more like playmates, encouraging play, following the children's play and being part of an emerging play space, which allowed for many unexpected encounters and simultaneous play occurrences. In an educational context, Resnick (2017) refers to this as 'playground-style play', because it allows children the opportunity to decide what to play with, within a structure (Resnick, 2017, p. 132). The audiences chose to experience interaction in a group. They gathered together like an impromptu happening around an area during the sessions. For instance, most groups gathered around the musical fruit and vegetable tray after they first entered the space. The format engendered situations that followed the rhythm and movement of the children and the performers. It created a space where different experiences could be integrated and explored without settling for one outcome. *The Runaway Hare*, on the other hand, was a promenade performance with seven scenes; it facilitated interaction in groups, storytelling, improvisation, and incorporated an open-ended play scene. The audiences had roles as collaborators and helpers, and they experienced more of a traditional relationship with the scenographic space than in *Into the Woods*. They were on a quest guided by the performer; it was goal-orientated, but they did not just witness the action, their experiences were active. The work can still be considered as open because the audience can interact with the scenography and all the objects in each scene, even

though they cannot change the outcome of the performance. The performer's level of improvisation in each scene was audience dependant; some children were more open and led their play (vignette 4.1, Chapter 7).

In contrast, others were happy to be directed (vignette 3.1, Chapter 7). The audience had the choice to move around to the other spaces at any time, although this did not often happen, as adults preferred to keep the children with them. Another practical reason may be that each space was dimly lit until the performer moved towards it.

One of the significant design approaches to increase engagement was to include open-ended play sessions. When the audience was given an open invitation to play, they could decide what objects they wanted to play with. Different types of interactions and play co-occurred within each scene (vignette 5.1 and 7.2). They could re-compose the scenography not only to engage the audience, but they could also contribute to the scenographic experience. The design is not only in the hands of the scenographer but also the audience as active players. This was evident during the open-play sessions in both studies and less so during the promenade performance, where the audience movements were controlled. The role of the scenographer as auteur changes to incorporate and facilitate objects and materials for the audience to co-create. The performance can affect how some children engage in the open-ended play scene. A combination of different types of play was observed, some children re-enacted parts of the story and played with the performer. In contrast, others created their own make-believe story, and some of the youngest children preferred to wander around, moving scenographic objects, collecting and carrying things from one space to another.

Each performance format has its constraints and limitations. The promenade performance did not suit all the children. Three children demonstrated very little inhibition (running around freely and interacting) during the open-ended scene, compared to the promenade performance. Equally, there were a few children who only stayed with their grown-up throughout *Into the Woods*, perhaps a more structured performance may have suited these children better. However, there is a similarity between the two examples discussed above, which if put together could

potentially present an approach to making scenography and performance and help theatre practitioners think about how the performance can be developed. Every TEY practitioner draws on their tacit knowledge and theatre-making experience. However, models of how performances are developed may help to make the process more transparent, visible and of benefit to the community. The next section discusses the role of the performer and participants/ audience.

8.2.1 Performer

The interrelationship between the performer and the audience in interactive theatre is essential. Therefore, it is necessary to consider the performer's approach. One of the significant challenges in TEY is for the performer to connect and be aware of the audience's needs. They usually have a performative strategy that supports and helps them to have meaningful experiences and communication with the audience. One of the issues is the children's age range as some children are communicating with their newfound language of words, and others are non-verbal. A performer needs to connect to both, in small groups, this is possible with one performer. However, in larger groups, the intimacy is lost, and the temporal nature of theatre means the performer has to be observant. The experiences of the performers in this research demonstrated how difficult this is to do. For instance, in the first study (vignette 3) the young child and the performer communicated through gestures, but the performer missed some of the child's reactions; devising in a live situation is very challenging for actors, especially with such an unpredictable audience. Giving space to play and moments of silence can give the child time to think and to take the initiative, make choices and lead the 'play' while remaining engaged in storytelling. By being alert and following a child's lead, the performer is valuing what they had to say.

The children in both performances responded to the devised and impromptu invitations from the performer to play. In turn, the performer was sensitive to the children, supported their interests by imitating their actions, following their stories, and being part of their imaginative play, gaining their trust as a result.

8.2.2 Children

Thinking of culture as both within and without (Egan, 1999) can help us understand the relationship of theatre with and for children. Egan argues that the middle ground is one of a ‘conversation’ where there is respect and value on both sides. Theatre without presumes authority and theatre within values only the experience and not the object. If we think of theatre as both within and without, then we can consider its value for both children and artists. Looking from without led to thinking from within and thinking from within led to interaction from without, they work simultaneously.

Like a voice, silence is not neutral but communicates meaning (Bucknall, 2014, pp. 1659–1666). It is especially relevant when working with very young children. This approach then does not consider children as passive or active audiences, but as experts in their own life (Bucknall, 2014). This implies that even in an ‘interactive’ performance, available space must be given to the minority of children who may hesitate or decline to play with a performer, so they feel confident to interact. For instance, in both performances, we observed some very young children (under two years) who stood or sat and looked on at the performer and other children for a few scenes (Chapter 7, vignette 3.1, 4.1). This same behaviour was observed in the longitudinal study of open-ended play sessions at a nursery – very young children chose, on several occasions, to look at what older children were doing; they even pulled up chairs to sit and watch. The researchers observed they were interested in watching things that were unfamiliar or beyond their capacity, compared to watching things that were within their capacity (Broadhead and Burt, 2012, p. 144). This behaviour trait seems to be more common in some younger audiences than older ones. Young children are acutely sensitive to their surroundings and very rapidly acquire an understanding of the people, places and routines in their lives, along with awareness of their own unique identity (Broadhead and Burt, 2012). However, silence does not mean that children do not want to interact; there are many reasons for their disposition. The presupposition that ‘children are naturally drawn to play’ can make us complacent, thinking children will interact in all playful space. Indeed, this is not always the case, and theatre practitioners can go some way in creating a conducive atmosphere for children. For instance, allowing children time

to relax, providing desirable objects that can be touched, free play within and without the performance. The performer asking open-ended questions, many of the traits in objects discussed earlier such as, familiarity and incongruence, humour in play and objects and songs. The findings from the two performances demonstrated using these methods revealed the capacity of a very young child to communicate through turn taking, waiting for a response and imitating gestures and sounds, all these are behaviours required for active participation in a performance. The sensitive theatre-maker will realise that not all of these would suit every child but including them within a performance may go some way in helping make the experience a valuable one that may go beyond the theatre walls.

Parents' feedback revealed that some children remembered the performance, and it had some effect on their play. For instance; associating objects – a child doing an activity with a feather referred to the hare, recounting – by telling or acting out the story for a parent who did not see the performance, imitating – playing hide and seek associated with objects (hare/rabbit), talking about the experience with a parent and being receptive – to play with shadow puppetry.

8.2.3 Parents/carers

Interactive performances can make some adults feel uncomfortable, even though there was no obligation to play; the situation naturally creates it. Playing with children is not easy, some adults find it challenging to play, primarily as in public they may feel embarrassed, like an outsider, exposed or uncomfortable in a group, and afraid of doing something wrong (Cohen, 2001; Goldstein, 2012). Some parents believe that children should play without adult interference while others were confused about how to support them. One parent felt they needed to encourage their child to interact during the scenes, even though she was happily looking. A study by Shine and Acosta (2000) on parent and child interactions at a children's museum found parents avoided playing because they felt uncomfortable and suggests that parents may need some guidance to facilitate play (White, 2012) successfully.

It is pertinent to note that having a free play session within a performance may help parents play with their children. Some parents did not interact/stood back during

The Runaway Hare, perhaps to let the children interact with the performers, but seemed to be happy to play with children during the free play scene. Parents also played with the technology elements without their children and were curious about them; this also happened at some of the playgroups – perhaps adults are drawn to interact with the unique scenography. It is a possibility that playful technology is not about teaching or learning but may potentially provide opportunities to help parents and children to play together. It is evident that research is required to explore creative approaches to help parents and adults play more. Parents play a central role in scaffolding. An adult's reaction to a child's behaviour is significant because, from a very young age, children are responsive to the values and judgement of adults, especially those familiar to them (Fawcett, 2009). Connecting to a parent or carer by touching base and sharing an experience, as found in vignette 1 in the first study and throughout the two performances was essential to many of the participating children. In study one vignette 2, for example, it was only after the child was introduced to the female performer while sitting on his mother's lap that he played with her.

8.3 Conclusion

The Interactive TEY model presented and discussed in this chapter is developed from an interdisciplinary position. It was derived progressively through a series of practical scenographic performance/ installations. It consists of four elements: Scenographic Paradigm, Technologies for Participation, Scenographic Configuration, Transitional Spaces. Each element contains several interrelated sub-elements that support the development of TEY scenography and performance (Table 8-1).

The interrelationship of the elements and the technological possibilities can pose a challenge to the scenographer and theatre makers. But fundamental to adopting the interactive TEY model is the acceptance of working within an interdisciplinary field. The model must be introduced early in the designing process to maintain a degree of flexibility, that will allow the scenography and interactions to be reinvented or fashioned into something new. Central to the approach is using the play pattern

framework to help explore and design for young audiences. An important benefit of using the interactive TEY model will possibly be to improve interactions and expand the scenography. If scenographers and designers use this model, they will need to carefully consider the role of the young audience and how the work benefits them.

The principles of the Interactive TEY model are applicable beyond theatre. If this work develops further then more HCI researchers, theatre artists and makers can engage with the technologies and the audiences in order to find out what best can suit them.

Chapter 9 CONCLUSION

This thesis set out to address the issues of making interactive TEY performances by focusing on interdisciplinary practice. It explored the creative affordances of digital DIY technologies for the design of interactive scenography. It sought to address the challenges faced by practitioners in making performances interactive and more ‘appropriate to the age of the child’ from a child’s right perspective.

The previous chapters have tried to make more explicit and achievable some of the complexities of creating interactive, participatory TEY by providing approaches for creating interactive scenography and guiding strategies for helping audiences to participate. Throughout this research, I have sought to discover what we can learn about the audience’s experiences, play and behaviours by observing them in interactive performance. Chapters 4, 6 and 8 have gone some way towards enhancing our understanding of applying technologies in TEY. I have provided evidence through my studio practice of how applying open-source hardware and software technologies in scenography have progressed from simple, sometimes unstable solutions to a more complex, robust, stable and affordable system that can be used in TEY. I have also made a case for the positive impact of interactive technologies in participatory performances in enabling audiences and performers to play and interact by reconceptualising the role that scenography can play in shaping the performative experience. TEY is shaped by a social discourse on childhood and contemporary performance, but I believe it has the potential to shape the discourse through the combination of research and practice.

This final chapter draws together, in three sections, what I have learned in undertaking this research. The first section focuses on the three research questions and outline in the introduction and how they have been achieved. The second section considers the contributions and implications of this research in the fields of theatre

and HCI. The third section considers the future possibilities, what research can to be done still and the implications for my artistic and research practice.

9.1 Research Questions

Returning to the first question in the introduction: *how can scenography be made interactive using digital and tangible technologies in theatre for early years?* To answer this, I conducted practice-based research and observations to develop a set of design paradigms for making interactive scenography and practical solutions for a technology system for interactive TEY performances.

The findings highlighted the potential usefulness and versatility of the design paradigms for developing interactive scenography. They are abstract concepts that can work for both digital and nondigital objects. For instance two of the most popular objects, the magic tree (digital) had several play patterns in particular – vertical – up and down and incongruency (Chapters 6 and 7) and the suspended discs (analogue) – several play patterns and an ambiguous design (Chapters 4 and 5). They were used at the beginning of a design process or to interrogate existing design ideas. The results of *Into the Woods* illustrates how the play patterns adapted form early years can work in design and were validated in children’s play (Chapter 5) during the performance. These findings evidence its usefulness as a design tool and go some way in supporting the idea of being a child-friendly method based on reliable research of children’s behaviour. They suggest a propensity for lateral thinking – creative combinations of design paradigms can lead potentially to several design solutions and alternatives. For instance, the suspended discs used the same framework for all discs but changed their added and subtracted elements in response to design paradigms by making holes and adding magnets (connection) and covering them with real material (sense of touch). They address the gestalt (whole) from spatial design, behaviour to the multisensory. Taken together, these findings suggest there is a role for these design paradigms in prompting the design of interactive scenography.

The findings enhanced knowledge of technologies that can be used for scenography and proved to be reliable and affordable for TEY. An open prototype-based design

approach was applied. The equipment used for crafting the interactive system consisted of open-source hardware and physical computing. They were designed as several standalone units, using wearable technologies, a soundboard and other microprocessors as well as soft handmade fabric and commercial sensors that enabled the experience of different non-visual sensory modalities. The system uses affordable technologies compatible with the Arduino platform from established companies in digital DIY maker communities. Therefore there is a host of online support and examples that can be used and customised, which is essential when trying to build a community of theatremakers. One of the shortcomings of using this type of system is that the technology market can be volatile.

Nevertheless, the benefits of the engaging interaction outweigh the limitations, and digital technologies have become more reliable, so by using established products, one could help to negate any issues. The system is developed as a 'Kit-of-Parts' to allow for flexibility and reuse of parts, making it more sustainable and affordable. For instance, *The Runaway Hare* fabric sensory mat which was installed at several non-theatre venues and was not reliant on whole theatrical stage systems. Particularly noteworthy is the use of sensor floors by other artists/companies such as Compagnia TPO, Cirque du Soleil and Krueger, one of the first artists to develop a sensing floor for responsive spaces in the 1960s.

The final system employed in *The Enchanted Forest* was dependable and sustainable, with over 17,000 visitors and running six days a week for one year. One of the strengths of this thesis is that it presents a comprehensive investigation of the whole system of taking TEY from 'page to stage', including studying the audience reactions, which is the focus of the next question

The second question was, *what role do the scenography and performer have in helping support and encourage audience participation, in theatre for early years?* The performances and installations presented in this thesis demonstrated how merging scenography and digital technologies could make an interactive environment. Resulting in the blurring of boundaries between audience and performer and audience and scenography. These findings suggest that unlike traditional

performances, the physical perception of the interactive scenographic space is relational and has a direct impression on an audience. Breaking down these distances encourages participation and interaction. For instance, a parent felt more immersed as if they were inside the story, and another parent felt that their children worked out the rules in *The Runaway Hare* and acted accordingly. The findings suggest the young audience reception of performances varied according to their age. Some children, especially the youngest, were interested in looking before physically participating, which correlates with the findings from Broadhead and Burt early years studies of free play in a nursery (Broadhead and Burt, 2012). Therefore, audiences would benefit from the inclusion of an open-ended play session as part of every performance. Some children found participating difficult from the outset and building familiarity with space, and the performer is essential. These findings imply that children who participate and those that choose not to should be taken into account when developing interactive TEY.

The performer played the role of a storyteller, facilitator, narrator and playmate. Her relationship with the children is pivotal in making the performance interactive. Most of the children seemed comfortable interacting directly with the performer. Her language was welcoming, and the inclusion songs were effective in engaging the young audience. She focused on open-ended questions and used words like “we” to create an impression of being part of a group. She also used gestures, which were often imitated by the children. Her direct eye contact with the children and positioning herself at their height made her part of their group. In the open-end play sessions, children sought her out to play with. Her flexibility and sensitivity to children made her ideal for interactive performances. Also, the performer used the interactive scenography to pace each scene and appreciated that she could control the lights and sounds herself.

The findings provide significant insights into the role of the performer and parents/carers in supporting and encouraging children’s participation and helping them to understand the interactive effects. Parents played with interactive technologies without children in both performances. Providing a space for the

exchange of greetings highlighted the potential usefulness of creating a space for relaxing at the start. The data from both performances demonstrated that children were happier to participate after the first ten minutes. The findings suggested providing parents with explicit rules of engagement may help to improve participation and avoid confusion about what the audience can or cannot do. Finally, the performances illustrated how interactive scenography provided distinct types of experiences for young audiences that would otherwise not be possible. For instance, the interaction occurred at the moment (real-time) as the audience can control lights and sound live in a playful interactive environment. Here the participation is with the technological object.

This research provided me with a better understanding of audience participation, the role of the performer and scenography to help improve my knowledge of how children respond to interactive technologies and different participatory modes.

In respect to the final question of this thesis, *how can interactive and multisensory scenography enhance the narrative experience for the audiences?* I conducted two qualitative studies that observed the audience and performers. The second study of *The Runaway Hare* (Chapter 7) was the more narrative focus. The findings provide additional evidence of the performer's interchanging role as the narrator/facilitator/playmate. The open-ended play scenes allowed for more interaction as the playmate; children's narratives reflected their interest more. In a promenade performance, the role of the facilitator and the narrator were interchangeable, and most of the children's interest was focused on the interaction with the scenography. The way a child perceived the experience and made sense of it affected the narratives and what role the performer played. These findings highlight and provide evidence of the flexibility that is required to be a performer in TEY. The studies enhanced our understanding of how interactive scenography can afford the performer some control. The performer could improvise the narrative more freely and pace the performance according to the audience reactions. For instance, in vignette 6.1 compared to vignette 5.1 in *The Runaway Hare*, some children were more interested in interacting. As the performer was in control, she continued to explore

different modes of interacting with the tree. This approach provided a space that asserts the unique and invaluable contribution that children can make to the atmosphere and aesthetic of the live theatre.

The multisensory and interactive scenography that focus on the senses and makes scenography more dynamic, magical and performative. I suggest this approach will prove useful in expanding our understanding of what narrative and communication can mean in performance — a simple example of how sound can play a role in an imaginative and symbolic play is in *Into the Woods*, vignette 8. The child's encounter with the performer further enriched their experience by connecting the sound to an original narrative as the sound took precedence over the material object. It demonstrated how sound could play a role in imaginative and symbolic play. The child's encounter with the performer further enriched his experience by making connections with the sound and an original narrative. It demonstrated how sound took precedence over the material object. This thesis has been one of the first attempts to thoroughly examine and demonstrate how interactive scenography and open-source technologies are applicable in the TEY.

9.2 Contributions and Implications

The research brings together early years practices, theatre concepts of designing scenography, and Human-Computer Interactions concepts of tangible and interactive technologies in order to shed new light on theatre for early years. The approach shows that there is value in thinking about how interdisciplinary practices and theories can shape the way we engage with a young audience in TEY.

This research contributes to the growing body of research into mixed reality strategies to support practitioners in the creative economy. Independent TEY companies prefer to disassociate themselves from the educational agenda (Koch, 2017; van de Water, 2012). This results from a long history of children's theatre having been tied to the school curriculum, which some artists perceive as limiting. However, this research found that the implementation of the play patterns

framework as a design method contributed to both practice and research. The play patterns/schemas are currently used for observing children's actions in nurseries and other early years play settings. This is the first study that used and tested it as a design methodology and within a performance context. The findings demonstrated how play patterns can still be observed in children's actions in a relatively short timeframe in a performance environment. Integrating play patterns in a design context can help extend the design concept and increase an object's playability for young audiences.

McCarthy and Wright found HCI and interaction design communities have not paid enough attention to citizen-led participatory culture (maker spaces, crowdfunding and hacking) (McCarthy and Wright, 2016). My research adds to what is known about the practical implication of digital DIY in theatre and specifically how it can be applied in a professional theatrical context and its relationship to interaction design for children (IDC). It suggests that using DIY technologies can help increase audience engagement. *The Enchanted Forest* demonstrated how technologies often used by IDC and Tangible, Embedded, and Embodied Interaction (TEI) communities for prototyping can be extended in novel installations for children and help to learn more about tangible interfaces and how children interact over a long period.

This research also brings the play pattern framework to the HCI communities, in particular IDC and TEI. There is very little research on how very young children used digital technologies and how to design for them. The increase affordance of touch screens, applications and digital toys for children under four have exposed a gap in HCI. The play patterns framework and my studies of very young children's use of a tangible interface can contribute to the newly emerging research area in HCI. My paper and demonstration at TEI. 2018 discussing the framework was received well by the communities of researchers

The interactive TEY model discussed in the previous chapter presents a comprehensive methodological approach to apply in the design and production of interactive TEY performances. It uses an interdisciplinary approach which supports the creative design methods that can increase audience participation. This

demonstrates the application of an affordable interactive system in *The Enchanted Forest* installation can realise its specific potential in engaging children and families. DIY technologies are reliable and affordable and can create novel interactive scenography that engages young audiences.

The findings of this research have implications for TEY practice. Legitimising and valuing children's theatre as an 'art form' has been an uphill struggle for companies throughout Europe and the UK (Koch, 2017, 2009). This research contributes to the growing body of research into strategies to support practitioners in TEY. It offers a practical, interactive TEY model for scenography.

As a direct result of this research, the following activities occurred:

The Enchanted Forest ran for four months in 2018 and then toured to Polka Theatre, London for three days at the Technotopia Children's Festival, May 2018. It was installed by public demand at Theatre Hullabaloo in April 2019 for six months. A total of 17,147 children and adults visited over the entire period.

The interactive sound meadow mat has toured nationally to various venues. Over 700 audience members used the interactive sound mat made for *The Runaway Hare* during 2018 and 2019 including at an early years mother and babies group at Quad, Derby and a Sense charity national family day. I was an artist/researcher in residence on the *Near and Far* project, a Magic Acorn East Commission. As part of this project, the sound mat was installed at three nurseries in Great Yarmouth, Norwich and Somerset and there were two TEY installations at Time and Tide museum (Great Yarmouth) and Norwich Castle. The installation was at Baron's Library, Newstead Abbey, Nottingham for *A Storybook Christmas* in 2019. The nursery, theatre and museum practitioners found it a useful asset in engaging children and families.

Academic papers were presented at TaPRA Scenography Working Group, Trinity Long Room Hub, Ireland, and the 7th International Research College of Theatre Arts for Children and Young People Symposium, Subotica, Serbia. Also, papers were presented at the ON THE EDGE symposium, ASSITEJ Artistic Gathering and World Festival of Theatre for Young Audiences, Birmingham, at the 12th ACM International

Conference on Tangible, Embedded and Embodied Interaction (TEI), Stockholm, Sweden and PQ. Talks were given at the Prague Quadrennial of Performance Design and Space 2019 and Staging Mixed Reality, National Theatre, London in March 2020.

I was invited to facilitate twelve practical workshops for over 600 attendees - arts practitioners, theatre and HCI researchers, nursery practitioners, children and families, care workers, and care home residents. These included Durham County Council in 2019, Frequency Festival 2019, Acorn East Network - Kettle Yard House, Cambridge in 2018, Sainsbury Centre for Visual Arts, Norwich in 2018, four different groups at Quad, Derby in 2018, Festival of Science and Curiosity, 2018, Polka Theatre in 2017, Lakeside Art Centre in 2016 and 2018, Imagine Digital, City Arts in 2017, and CDT Summer School 2017, Newcastle.

I suggest that there is more to gain than to lose if we shift to making arts experiences more interactive for very young children. This is by no means a easy move. Among the main barriers are economic pressures and the conditions that arts and theatre practitioners face. This research addresses these by demonstrating real practical cases for the use of affordable technologies and the interest and support it has had within the theatre community, early years education, visual arts, museums and festivals.

9.2.1 My Research Practice

Contemporary scenography is changing, and the field is rapidly expanding (McKinney and Palmer, 2017) as are TEY and our relationship with digital technologies. When a field (art) expands, Krauss argues that it is characterised by the individual artist and the medium experiencing ‘a logically determined rupture’ (Krauss, 1979, p. 6). Rupture is when ‘art breaches the known and contemplate alternatives’ (Eckersall and Grehan, 2014, p. 2). I situate my practice in the in-between place where rupture and continuity coexist in tension. For me ‘rupture’ points to divergence and response of ‘TEY acts’ and experience that allows us to consider and reconsider the role of children in society and at the same time giving their voice a place. For me, children’s theatre is inspirational and gives me the freedom to create an imaginative design.

When the tools evolve within a design practice, the discoveries and learning are facilitated by the tools, not limited by their parameters. It is only when artists use these technologies can we have a dialogue about how they can be embedded and developed for our needs. This research has facilitated this, and I will pursue the development of the sensor floor to one that better suits performance and installations.

I have come to think differently about the binary notion of what counts as ‘pedagogy’ and ‘culture’ and by whom. They do not have to be mutually exclusive, very young children do not make the distinction, they learn from their play and the experiences of everyday life, theatre included. I find it difficult to draw a clear line between pedagogy and theatre. My encounters engaging openly with early childhood pedagogies has helped me see differently. There is more to gain from a real partnership with early childhood research.

9.3 The Future

Reflecting on what I would do differently, there are three main areas, firstly I would include the TEY community much earlier on in my research process. After presenting my research to the community in mid-2016, several opportunities arose that supported my research and led to widening participation and interdisciplinary collaborations. This direct connection helped me to assess the value of the research to the TEY community. Secondly, I would allocate more time to experiment with technologies and create more prototypes early on and to find collaborators. Designing, building, and evaluating the entire interactive performance was a difficult task on my own, and the quality of the scenography suffered especially in the first study. The example of *The Runaway Hare* was critical to my future success. It demonstrated the technologies in performance and increased community support and trust in my research and work. They could visualise the potential of the technologies. Thirdly, I would talk to parents more and bring them into the research process earlier. Researchers could learn a lot from the parents attending and how

they view their children's actions. *The Runaway Hare* post-performance survey to parents demonstrated the effects of the experiences on some children after they leave a performance. More evidence of this will help to make a case for the importance of TEY and arts in general to very young children's experiences.

Moving forward in the future, I would like to do more research to understand parent's motivations in bringing children to the theatre. To understand how they value play and playfulness and to understand better how parents play with their children. *The Enchanted Forest* was popular with all children, including children with various disabilities. Therefore another research project would be to investigate how to design better interactive scenography and installations for children with complex disabilities and on the autistic spectrum.

I would like to start a company to develop interactive performances and installations. The work would experiment with different current technologies that are not often experienced by children such as AI, haptic and sensing technologies. *The Enchanted Forest* demonstrated the value of these experiences in a small community. There were many repeat visits, and parents appreciated the quality of the work.

The work would tour around to various arts and cultural venues. This would require more research to create an adaptable interactive system that will benefit my company and the wider TEY community. Overall the experience of using interactive technologies at several venues in 2018 and 2019 has raised some issues concerning how to make these technologies even more accessible and robust for theatremakers. For instance, all the microprocessors used for *The Enchanted Forest* were circuit boards and needed a lot of preparation to make them practically ready. This may have an effect on its uptake by the theatre community. A plug-in and play system is required and maybe one that could potentially collect anonymous data on how visitors use the interactive scenography. There is potential benefit in designing a central monitoring unit where all the components such as the sensors and microcontrollers can be viewed and monitored. It could help in maintenance and troubleshooting for TEY installations remotely.

Overall the research has expanded my practice as a scenographer and researcher. It exposed me to a wide range of methodological tools. I encountered the ‘anxiety’ of interdisciplinary practice that created tensions and challenges between the scenographic and HCI methods, physical and technological materials, artist and audience centred needs and the value systems attached to these by the different disciplines.

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APPENDIX 1 *INTO THE WOODS* PARTICIPANT INFORMATION

Participant Information Sheet – Into the Woods Research Project

You and your child are invited to participate in a research study conducted by Roma Patel, a PhD student from the University of Nottingham, Horizon Digital Economy Research, and Computer Science Department. The aim of the study is to learn more about designing and making sensory, interactive, theatre for young audiences using various digital technologies.

If you and your child decide to participate, it will involve joining in the activities planned with the organisers at the Lakeside Arts Centre. The activities are child-led and involve you and your child interacting with a performer, various types of craft and smart materials and if possible, conversing or showing the researcher things that you and he/she is interested in or things done in the study. The study will be recorded using video, audio, photographs and field notes of the things that you and the child make or how he/she interacts with materials. All this material will be available for you to view as well.

You and your child could benefit from interacting with new material and tactile objects and help us understand how to make theatre for very young audiences better. However, I cannot guarantee that you or your child personally will receive any benefits from this research.

The findings of the research will be written up in a Thesis, and the written work may include quotations from our conversations, but individuals will never be named. Any information that is obtained in connection with this study that can identify you or your child will remain confidential and will not be disclosed without your permission. Subject identities will be kept confidential, and all transcriptions of conversations will be anonymised. All photographs and audio-visual materials will be stored electronically on a password-protected computer system under the control of the University of Nottingham for at least seven years from the date of any publication. Yours and the child's contributions are immensely valuable to us. However, if you decide at any stage to discontinue your and the child's participation, you are free to do so, and it will not in any way affect your or your child's relationship with Lakeside Arts Centre or the University of Nottingham.

If you or your child have any questions about the study, please feel free to contact by emailing myself Roma Patel – roma.patel@nottingham.ac.uk, or my Principal Supervisor Dr Boriana Koleva- B.Koleva@nottingham.ac.uk, or by writing to us at School of Computer Science, University of Nottingham, Jubilee Campus, Wollaton Road, Nottingham, NG8 1BB.

Thank you for participating

Roma Patel

YOUNG PARTICIPANT CONSENT FORM

Project titleInto the Woods –Research Project

Researcher's nameRoma Patel.....

Supervisor's name ...Dr Boriana Koleva

YES ☐ I confirm I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree for my child to take part in the activity at the Lakeside Arts Centre.

YES ☐ I understand that my child may withdraw from the research project at any stage and that this will not affect my status now or in the future and all previous materials related to my involvement with the research project will also be securely erased (when possible) - unless

YES ☐ I understand that while information gained during the study may be published, and my child will not be identified, and my personal results will remain confidential. The transcriptions (excluding names and other identifying details) will be retained by the researcher and analysed as part of the study. The researcher, her supervisors and researchers directly involved in the analysis will view any of the original materials

YES ☐ I understand that my child will be recorded using video and audio during the activity, conversations and interviews.

YES ☐ I understand that anonymised personal quotes may be used in the researcher's thesis and publicly available academic publications.

YES ☐ I understand that the data will be stored electronically, all photographs and audio-visual data from the workshops will be stored on a password-protected computer system under the control of the University of Nottingham

YES ☐ I consent to audio/video/photographs (delete according to preference) of my child's participation being used in research dissemination after they have been anonymised (e.g. academic publications and broadcast).

In all cases, I consent for my identity to be revealed through, audio ☐, video ☐, photographs ☐ (**please initial each box if you consent**)

TO BE COMPLETED BY THE PARENT/GUARDIAN

I confirm that I have freely agreed to give permission for the child (named below) to participate in the Runaway Hare Performance study part of Crafting Touch research project. I have been briefed on what this involves, and I agree to the use of the findings as described above.

Name of child _____

Relationship to child _____

Age of the child _____

Signature _____ Date _____

ADULT PARTICIPANT CONSENT FORM

Project title Into the Woods –Research Project

Researcher's nameRoma Patel.....

Supervisor's name Dr Boriana Koleva

The University of Nottingham attaches high priority to the ethical conduct of research. We, therefore, ask you to consider the following points before signing this form. Your signature confirms that you are happy to participate in the study. **Please initial in the box as applicable:**

- YES ☐ I confirm I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part in the activity at the Lakeside Arts Centre.
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(please initial each box if you consent)

Participant Name.....

Participant Signature.....

Researcher's Signature.....

Date.....

APPENDIX 2 *INTO THE WOODS* PRESHOW QUESTIONNAIRE

Pre- show short Questionnaire

We appreciate your help in our research-all responses are anonymous

Background details

1. How old is your child _____ years _____ months

2. What Gender? ☐ Boy ☐ Girl

Questions regarding play

3. Does your child play pretend games or make-believe? ☐ Yes ☐ No

4. What kind of games or activities does your child currently like playing?

Please list in the box below:

Thank you for your help.

APPENDIX 3 *THE RUNAWAY HARE* PARTICIPANT INFORMATION

Invitation used to recruit audience members.



The Runaway Hare Research Project Information

The Runaway Hare is a Hide and Seek adventure for Toddlers (18months to 3 years) and their Grown-ups. The performance is developed and designed by the Theatre Designer Roma Patel, as part of her PhD research at the University of Nottingham, Horizon Digital Economy Research and Mixed Reality Lab. The research is focused on designing visual, sensory and interactive digital enhanced performance spaces to harnesses young audiences innate playful nature. The performances will take place on 9th and 10th January 2017, at the Lakeside Arts Centre, Performance Arts Studio in Nottingham.

The performances will involve audiences as co-creators; some of the activities are child-led and involves them directly influence the action, choosing where to play and collaborating with the performer. The performance will be recorded using video, audio, photographs and field notes. You and your child could benefit from interacting with new materials and tactile objects and help us gathering inspiration for our future work. However, I cannot guarantee that you or your child personally will receive any benefits from this research.

The findings of the research will be written up in a Thesis, and the written work may include quotations from our conversations, but individuals will never be named. Any information that is obtained in connection with this study that can identify you or your child will remain confidential and will not be disclosed without your permission. Subject identities will be kept confidential, and all transcriptions of conversations will be anonymised. All photographs and audio-visual materials will be stored electronically on a password-protected computer system under the control of the University of Nottingham for at least seven years from the date of any publication. Yours and the child's contributions are immensely valuable to us. However, if you decide at any stage to discontinue your and the child's participation, you are free to do so, and it will not in any way affect your or your child's relationship with Lakeside Arts Centre or the University of Nottingham.

If you or the child have any questions about the study, please feel free to contact by emailing myself Roma Patel – roma.patel@nottingham.ac.uk, or my Principal Supervisor Dr Boriana Koleva B.Koleva@nottingham.ac.uk, or by writing to us at School of Computer Science, University of Nottingham, Jubilee Campus, Wollaton Road, Nottingham, NG8 1BB.

YOUNG PARTICIPANT CONSENT FORM

Project titleThe Runaway Hare –Research Project

Researcher's nameRoma Patel.....

Supervisor's name Dr Boriana Koleva

YES ☐ I confirm I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree for my child to take part in the activity at the Lakeside Arts Centre.

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YES ☐ I understand that anonymised personal quotes may be used in the researcher's thesis and publicly available academic publications.

YES ☐ I understand that the data will be stored electronically, all photographs and audio-visual data from the workshops will be stored on a password-protected computer system under the control of the University of Nottingham

YES ☐ I consent to audio/video/photographs (delete according to preference) of my child's participation being used in research dissemination after they have been anonymised (e.g. academic publications and broadcast).

In all cases, I consent for my identity to be revealed through, audio ☐, video ☐, photographs ☐ (**please initial each box if you consent**)

TO BE COMPLETED BY THE PARENT/GUARDIAN

I confirm that I have freely agreed to give permission for the child (named below) to participate in the Runaway Hare Performance study part of Crafting Touch research project. I have been briefed on what this involves, and I agree to the use of the findings as described above.

Name of child _____

Relationship to child _____

Age of the child _____

Signature _____ Date _____

ADULT PARTICIPANT CONSENT FORM

Project title The Runaway Hare –Research Project

Researcher's nameRoma Patel.....

Supervisor's name Dr Boriana Koleva

The University of Nottingham attaches high priority to the ethical conduct of research. We, therefore, ask you to consider the following points before signing this form. Your signature confirms that you are happy to participate in the study. **Please initial in the box as applicable:**

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- YES ☐ I understand that the data will be stored electronically, all photographs and audio-visual data from the workshops will be stored on a password-protected computer system under the control of the University of Nottingham
- YES ☐ I consent to audio/video/photographs (delete according to preference) of my participation being used in research dissemination after they have been anonymised (e.g. academic publications and broadcast).

In all cases, I consent for my identity to be revealed through, audio ☐, video ☐, photographs ☐
(please initial each box if you consent)

Participant Name.....

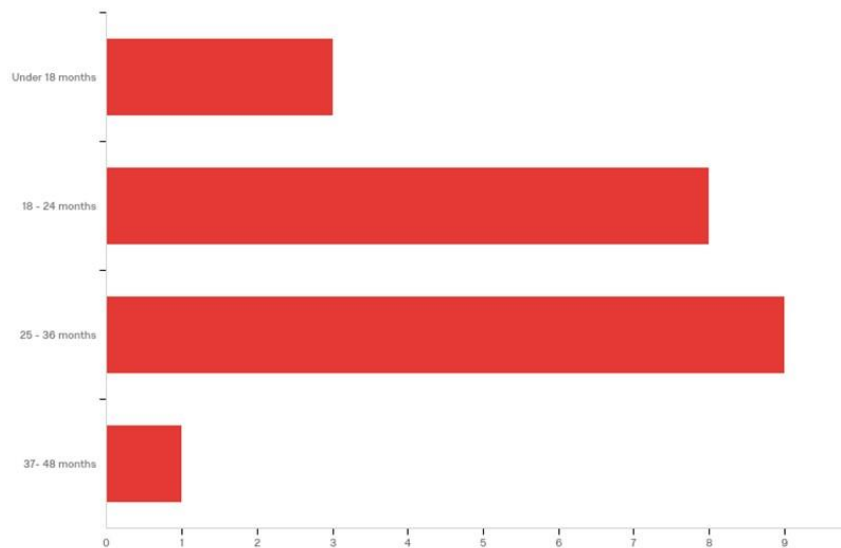
Participant Signature.....

Researcher's Signature.....

Date.....

APPENDIX 4 *THE RUNAWAY HARE* POST SHOW PARENT/ CARER SURVEY

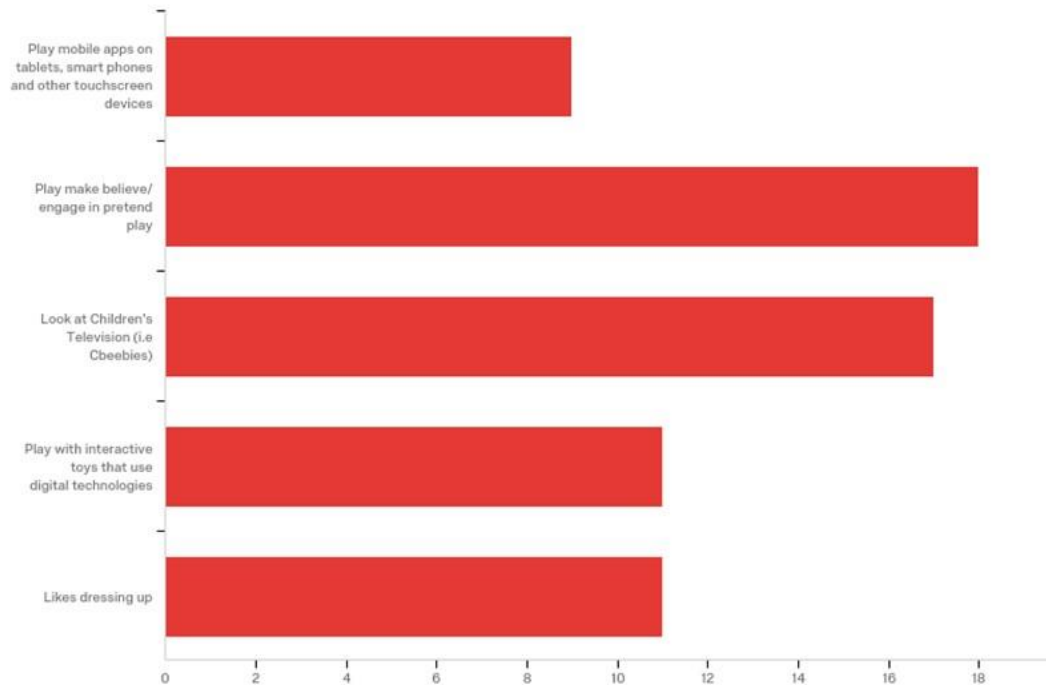
Q2.1 – Which of the following age groups do the child (ren) you brought belong to? (select all that apply)



Q2.1 – Which of the following age groups do the child (ren) you brought belong to? (select all that apply)

#	Answer	%	Count
1	Under 18 months	15.00%	3
2	18 - 24 months	40.00%	8
3	25 - 36 months	45.00%	9
4	37 - 48 months	5.00%	1
	Total	100%	20

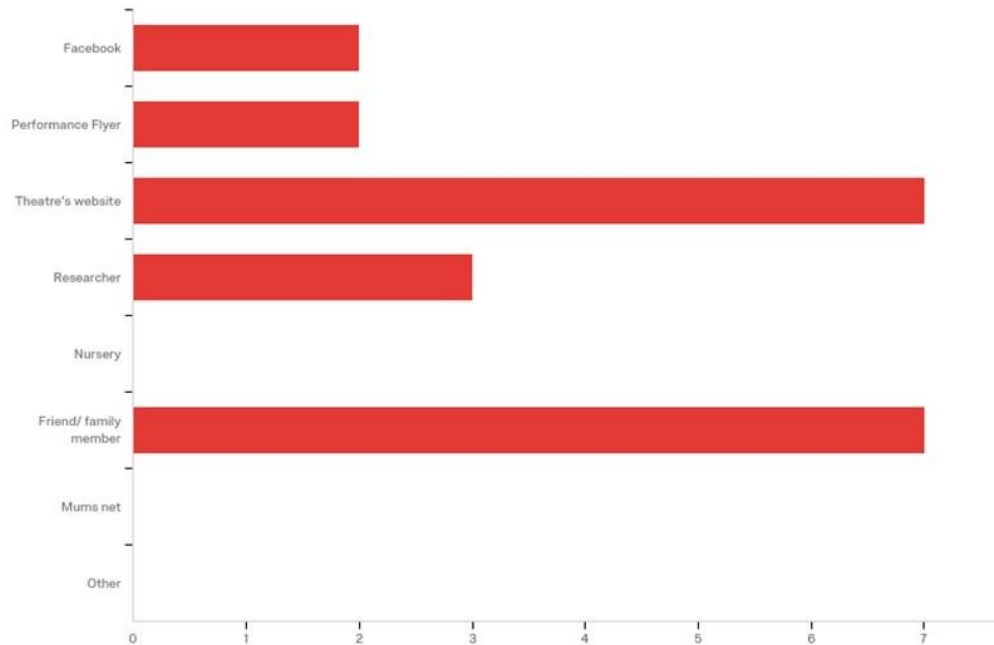
Q2.2 - Do the child (ren) you brought to see The Runaway Hare:
(select all that apply)



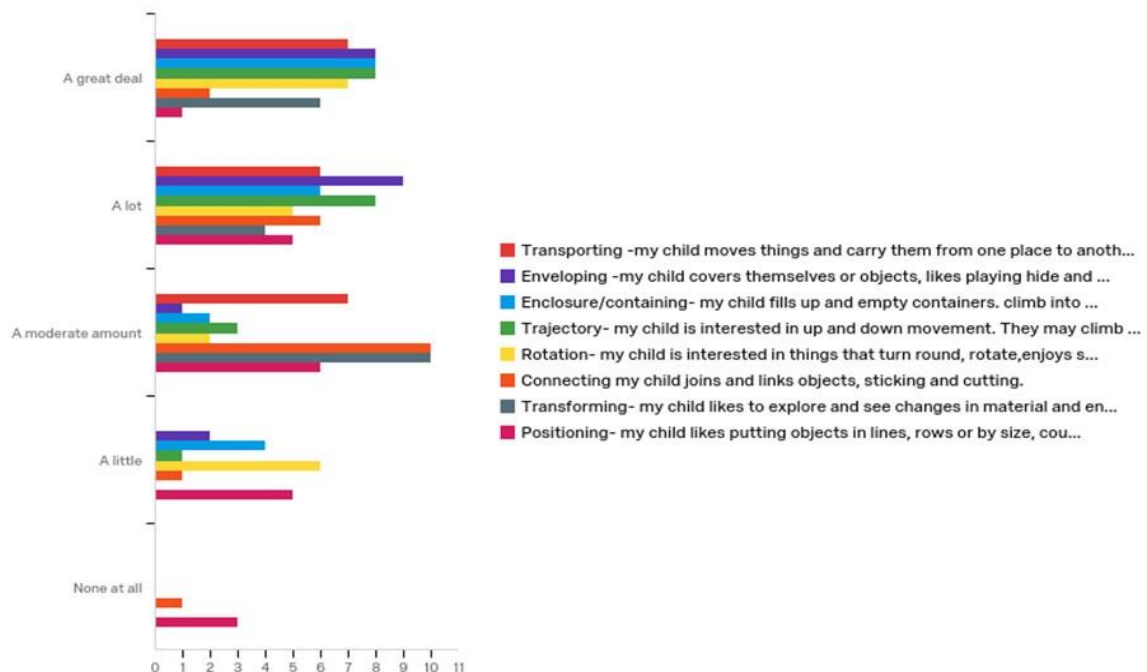
Q2.2 - Do the child (ren) you brought to see The Runaway Hare: (select all that apply)

#	Answer	%	Count
1	Play mobile apps on tablets, smart phones and other touchscreen devices	47.37%	9
2	Play make believe/engage in pretend play	94.74%	18
3	Look at Children's Television (i.e Cbeebies)	89.47%	17
4	Play with interactive toys that use digital technologies	57.89%	11
5	Likes dressing up	57.89%	11
	Total	100%	19

Q2.4 - How did you hear about The Runaway Hare performance?



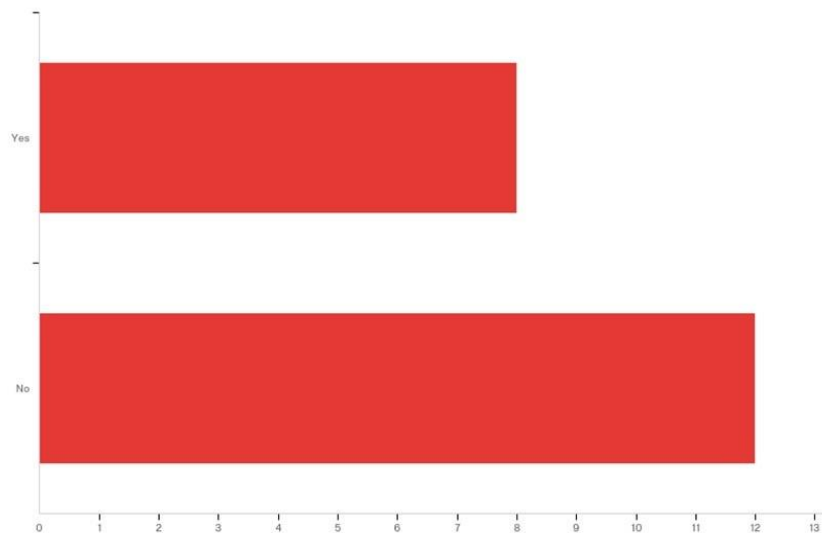
Q2.3 - The design of The Runaway Hare was influenced by schemas - repeatable play patterns observed in children. These play patterns help forge to connections in the brain and are things that children naturally do, but can be enhanced and supported by activities. They may occur one at a time or several, the length of engagement in a particular schema/s varies and is different for each child. To what extent have you noticed any of the following behaviours in your child(ren) everyday play



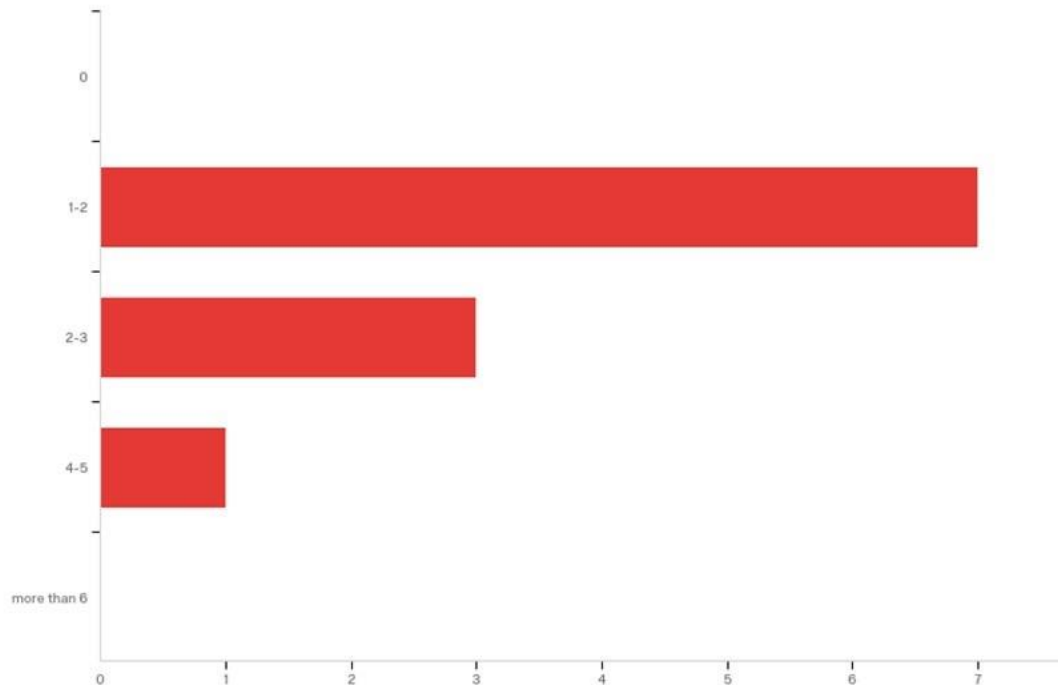
Q2.4 - How did you hear about The Runaway Hare performance?

#	Answer	%	Count
1	Facebook	10.00%	2
2	Performance Flyer	10.00%	2
3	Theatre's website	35.00%	7
4	Researcher	15.00%	3
5	Nursery	0.00%	0
6	Friend/ family member	35.00%	7
7	Mums net	0.00%	0
8	Other	0.00%	0
	Total	100%	20

Q3.1 - Is The Runaway Hare the first children's theatre performance that your child(ren) has experienced.



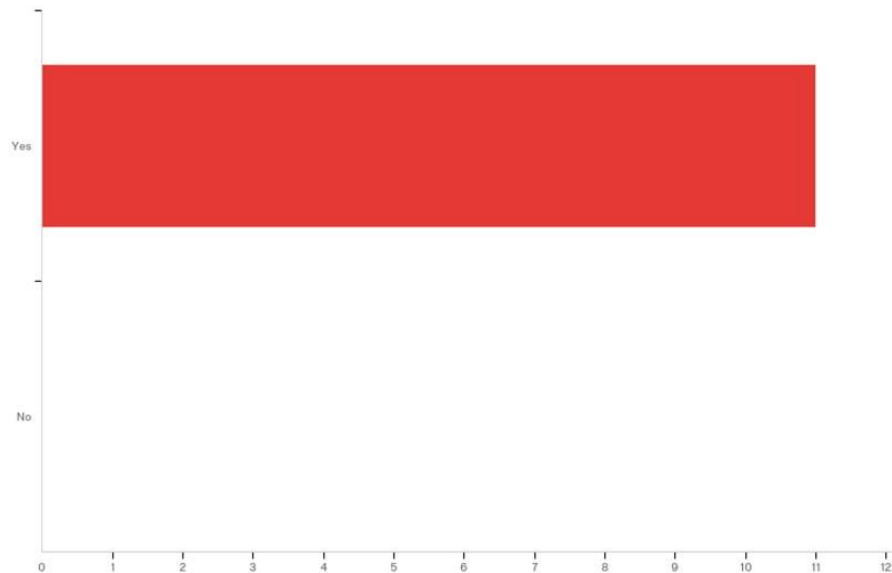
Q3.2 - Approximately how many Theatre performances have your child seen in the last 12 months?



Q3.2 - Approximately how many Theatre performances have your child seen in the last 12 months?

#	Answer	%	Count
1	0	0.00%	0
2	1-2	63.64%	7
3	2-3	27.27%	3
4	4-5	9.09%	1
5	more than 6	0.00%	0
Total		100%	11

Q3.3 - Would you say The Runaway Hare was different from other children performances your experience?



Q3.4 - Please explain HOW is it different?

You can write as much or as little as you want, or choose to skip this question.

Please explain HOW is it different? You can write as much or as little as...
I loved the interactive nature of the performance and that Felix was able to join in and move around as he wanted. I always find it refreshing when we do something with few boundaries . It's lovely to see children truly able to explore their environment freely.
Interactive not just a show to watch
More interactive and story telling style.
This one my children were part of it and involved. Other performances we were sat in an audience
The Runaway Hare was interactive with the children feeling part of the story. It was so nice that they could touch and play with everything around them
It was interactive and enable the children to join in and become a part of the production rather than just watching it.
The other two were sit and watch type performances, the runaway hare was interactive. The group was much smaller and my daughter could move about as she pleased (within reason!)
The other performance they saw involved a much broader audience and staying at a single location for most of the play.

Q3.4 - Please explain HOW is it different?

You can write as much or as little as you want, or choose to skip this question.

Please explain HOW is it different?

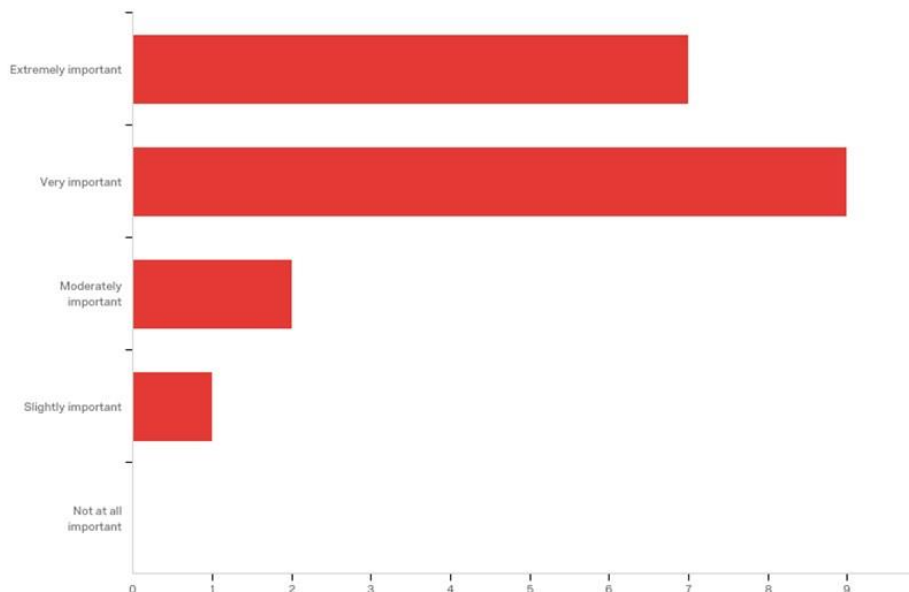
You can write as much or as little as...

She has seen one piece of outdoor theatre which popped up in the round but had no participation. It used hydraulics, music and movement to convey a story. She sat still and was captivated by this and still talks about it to this day. She has also seen 'Shiny' at Deda by Turned on its Head about a year ago, which was thrust style all on floor level so the children could watch at times and join in at others. This was not baby led but was engaging and visually stimulating. She would be too young to remember it but she loved that too. **I think my daughter felt from the beginning that this was a child led piece and responding accordingly. The performer was warm and inviting and our little girl was keen to play throughout.**

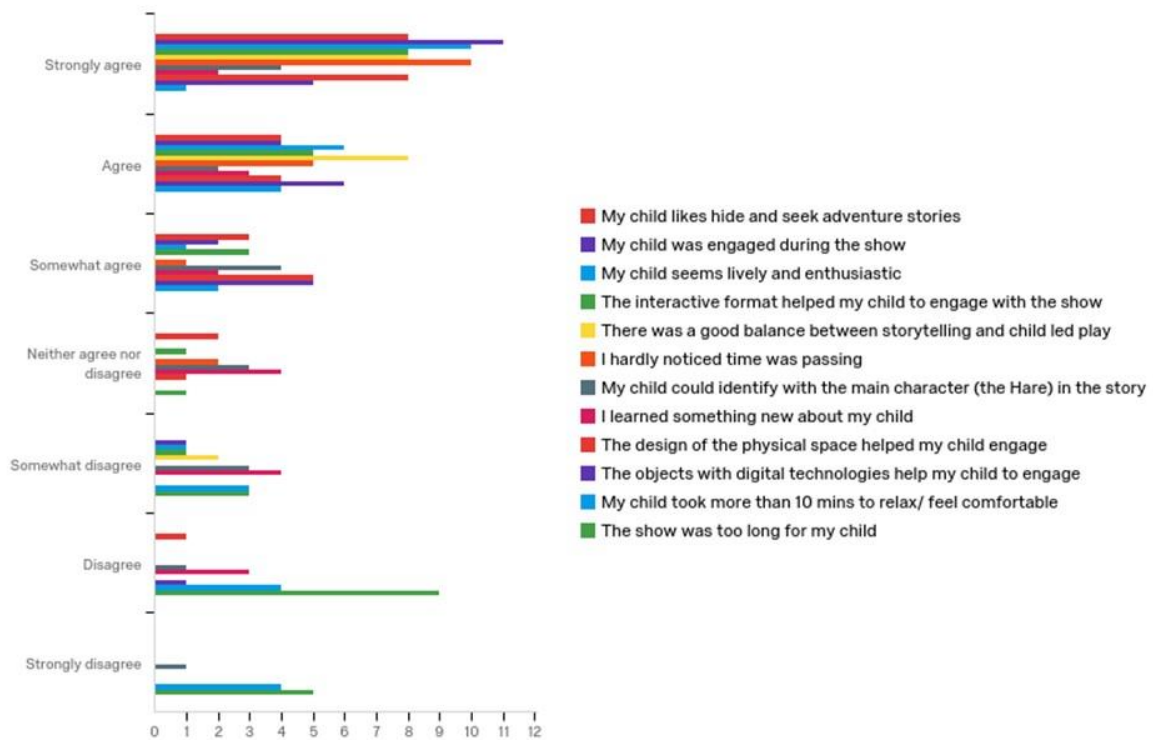
The group was small so my son had space and time to explore if he wished to. The performance was interacting and free flowing, it was engaging and fun. **I personally like that the participants were "on the set" if it makes sense, we were inside of the story.**

The interactive nature was the key difference - **they loved this and also that the structure was loose i.e., they could go back to things they enjoyed and explore some more.**

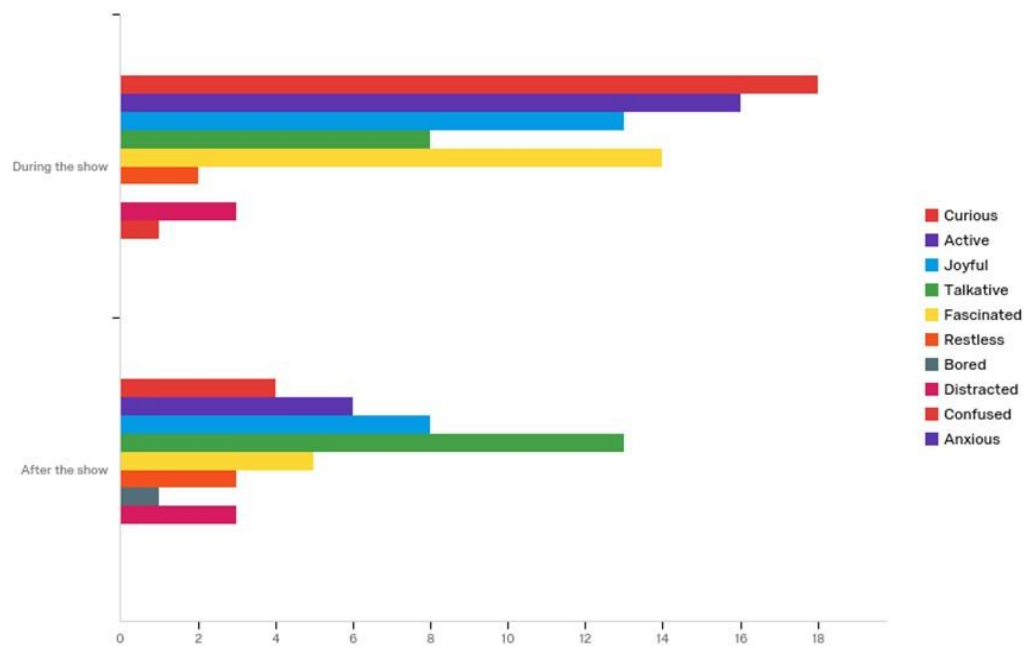
Q3.5 - How important is it that more children's Theatre performances are interactive and available to you in the future?



Q4.1 - When thinking about The Runaway Hare, please rate the following statements



Q4.2 — Thinking about the reactions of the child (ren) you brought to The Runaway Hare, please select any words which reflect their behavior during and after the show



Q4.2 – Thinking about the reactions of the child(ren) you brought to The Runaway Hare, please select any words which reflect their behavior during and after the show.

#	Question	During the show		After the show		Total
1	Curious	81.82%	18	18.18%	4	18
2	Active	72.73%	16	27.27%	6	16
3	Joyful	61.90%	13	38.10%	8	13
4	Talkative	38.10%	8	61.90%	13	15
5	Fascinated	73.68%	14	26.32%	5	14
6	Restless	40.00%	2	60.00%	3	4
7	Bored	0.00%	0	100.00%	1	1
8	Distracted	50.00%	3	50.00%	3	5
9	Confused	100.00%	1	0.00%	0	1
10	Anxious	0.00%	0	0.00%	0	0

Q4.3 - How would you describe your child(ren) behaviour DURING and AFTER the show?
You can write as much or as little as you want, or choose to skip this question.

How would you describe your child(ren) behaviour DURING and AFTER the show?...
Martha was really engaged during the show and was active afterwards . She always enjoys pretending we are acting out books when we are out and about.
They are always a little shy in new environments (one more than the other), so it took them a while to get comfortable. They were curious about the different elements of the performance space , but I'm not sure how much they appreciated the narrative that tied everything together. I suspect they thought of it as a number of interesting, but not necessarily sequential or related, areas.
Interested in what was happening but it took quite a lot of encouragement for her to engage without my lead . she would have been quite happy to sit with me watching the proceedings.
Ellis was engaged and enjoying the show. He was curious partically with the sounds he could initiate . He was very talkative afterwards discribing what he had being doing.
She was fully engaged, curious, excited and enthusiastic both during and after the show.
She was a bit shy at the start, but got really into it after 10 minutes or so, once she worked out that she could play with things .
She seemed at ease with the format (perhaps similar to how they play at nursery) and got involved fairly quickly. Afterwards she was tired.

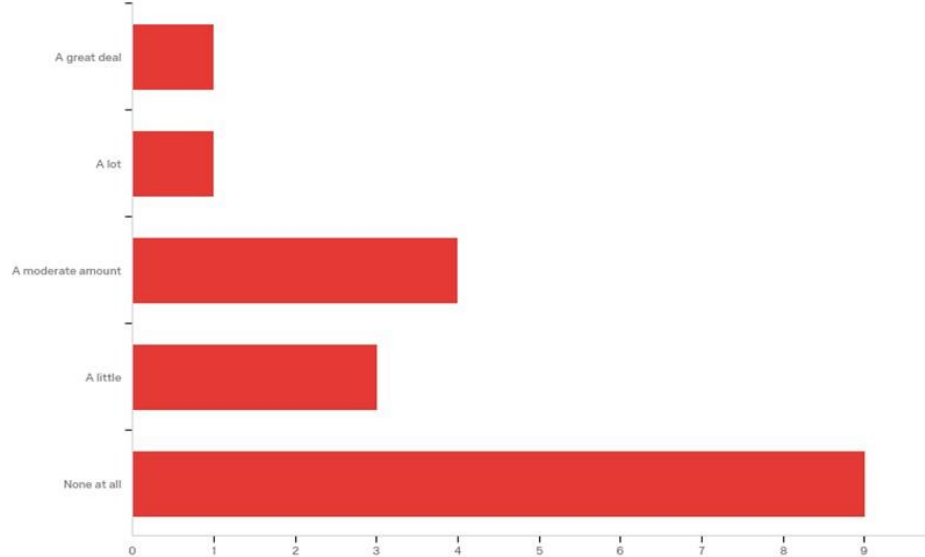
Q4.3 - How would you describe your child(ren) behaviour DURING and AFTER the show?
You can write as much or as little as you want, or choose to skip this question.

How would you describe your child(ren) behaviour DURING and AFTER the show?...
During the storytelling sections my daughter was really engaged, she behaved really well throughout but did want to take the little lights home! After a little bit of the free play at the end she was bored though and announced "I want to go home". As a 2.5 year old who goes to nursery I think she was expecting more storytelling and when she realised that was over, it was her cue to leave and move on to another activity (a glass of milk in the cafe!)
I can't remember, it's been 10 days now, and a few bad nights in between.
He absolutely loved it and was so engaged and switched on. Since the show he says harr and makes ears with his hands. He also try's to hop as well.
It surprised me how quickly our little girl warmed up to the situation. We had been talking about seeing a 'show' all day and she had been relating this to the last show (The Urban Astronaut) in September using her words and sign language. She was the most involved at the start but by the end, when all the other children had warmed up, it was easy to see that everyone was engaged. She hadn't napped yet so was a bit restless by the free play at the end and keen to go home. Had she had a nap, it might have been different though which is why I didn't find it worth mentioning above - as it wasn't due to the performance. She loved the tree the most and still talks about pulling the feathers out most days. We came home and used the puppet show theatre she got for Christmas to show her daddy what happened. She found a teddy rabbit and was reenacting bits that she remembered: the feathers, the lights, singing row your boat, and bouncing on the grass. She has seen feathers since and without prompting, relates them to the tree. So this clearly was inspiring for her!

Q4.3 - How would you describe your child(ren) behaviour DURING and AFTER the show?
You can write as much or as little as you want, or choose to skip this question.

How would you describe your child(ren) behaviour DURING and AFTER the show?...
At the beginning of the show my son was quite sleepy and a bit grumpy, he didn't really want to engage and was shy. It doesn't normally take him 5 min or so to get used to the new class / group. However, he was quite active and curious for the rest of the performance. He loved exploring various digital / electric pieces, he is very attracted to anything with switches so he liked the little torches - I felt that he got distracted by them (I haven't noticed other kids plying with them that much) so I felt that I should try to take it off him so he could continue to explore. After the performance we discussed and re-lived the story in the car and over dinner table.
He was very interested in the show and very happy, contented and sociable afterwards
They were extremely happy and energised by the performance
My child was fascinated once she had a few minutes to calm down, we were late and missed the story telling at the beginning which is a shame as I think she would have benefited from that. The show was really engaging and we loved playing around in the set afterwards almost as much as the show itself, having the freedom to explore the area was very exciting for my little girl. Afterwards Alice was happy as she had such a wonderful time and tired from all the stimulation, she was asleep in the car very soon after we left.
Very engaged and inquisitive during. Inpatient afterwards.

Q4.4 - How much has the child(ren) who came to The Runaway Hare referred to it or brought it into their play since the show?



Q4.4 - How much has the child(ren) who came to The Runaway Hare referred to it or brought it into their play since the show?

#	Answer	%	Count
1	A great deal	5.56%	1
2	A lot	5.56%	1
3	A moderate amount	22.22%	4
4	A little	16.67%	3
5	None at all	50.00%	9
	Total	100%	18

Q4.5 - If the child(ren) have referred to it or brought it into their play, please describe one incident you noticed. You can write as much or as little as you want, or choose to skip this question.

If the child(ren) have referred to it or brought it into their play, please...
He hasn't but I think he's too young to do this
My 3 year old has mentioned it a couple of times in particular blowing feathers and the tree that lit up
Khyro is my granddaughter therefore she may have mentioned The Runaway Hare without my knowledge.
Ellis has been using the phrase "whats that sound?" Then searching for the source of the sound
She hid her toy rabbit and asked her big brother to find it then they continued to play this game taking it in turns for 20 minutes,
Later that afternoon I found her rocking and trying to sing 'row row your boat' - this is something they do at nursery too but I hadn't seen her do it at home until after the show where this was a theme.
We are playing "hide and seek like the hare". "I love the boats" (when talking about what she enjoyed)
They can't talk yet

Q4.5 - If the child(ren) have referred to it or brought it into their play, please describe one incident you noticed. You can write as much or as little as you want, or choose to skip this question.

If the child(ren) have referred to it or brought it into their play, please...
He hops around like a rabbit
We were making sensory bottles at a group and she picked up the feathers, blew them and said 'rabbit' and 'show'. She has also taken to playing with the rabbit teddy we used for the puppet show in her play - when she hadn't bothered with it before.
I can't remember for sure now, but I think I tried to remind and encourage chats about the preformance afterwards, so not sure if my son had an opportunity to mentio it first!:) this says something about me! When I was skating him questions, he was able to remember what happened and what we did.
I have done shadow play with him since and i think he was more receptive to this because of the show
My little girl is a bit young to be able to do this

Q4.6 - How could you or the child (ren) you brought to the show interactive experience have been improved?

You can write as much or as little as you want, or choose to skip this question.

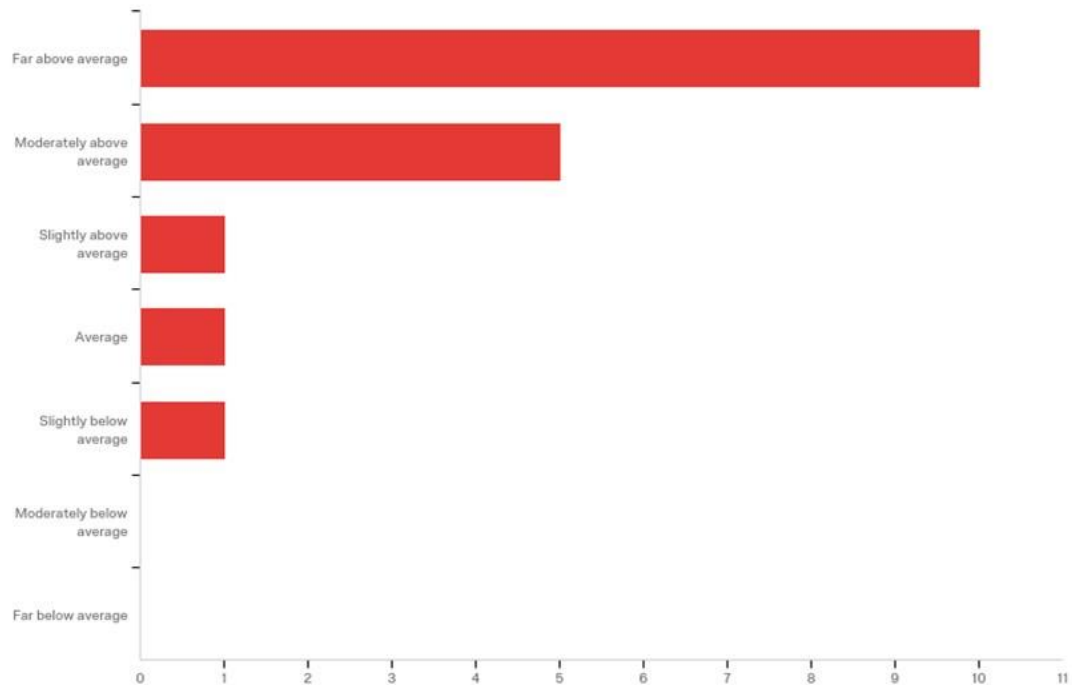
How could you or the child (ren) you brought to the show interactive experi...
I think it was excellent and didn't really need improving
I think the role of the parents could have been better defined. I wasn't sure if I should intervene and help my child use the various props or to keep out of the way. Some sort of briefing of that nature might help parents help their children make the most of the interactive nature of the experience.
I felt the interactive elements of the show were great. The only improvements I can think of would be the introduction a reminder of who they were looking for, something like a photo of the hare that they could carry with them.
It couldn't have been improved - it was fantastic!
I thought it was a bit dark at times.
Knowing my daughter, she would just like to have the chance to answer questions or do more in relation to the story/ main characters e.g. Where was the hare? What was he doing. But that is my daughters preference when it comes to stories, likes to get involved it telling/ retelling aspects of the story in her own words.
Getting to see and touch the hare for real beforehand may have helped them to connect with the character. Our child is very young and can't talk yet. They didn't have any interest in photos of the hare or hearing about it. Possibly also making the traces of the hare more relatable to the hare... It's hard to associate the voice that says "do you know where I am?" with that of a hare. Tech-driven interactivity didn't seem as good, reactive or self-explanatory as interacting with materials: Even as an adult, I felt the texture of the butterflies more responsive than other parts of the show. Also, despite the moments of "free play" being framed as such, I think there was an expectation, at least on my side, that this free play should be oriented towards using the technology in the way it was designed. In the end, my child just wanted to run around with funnels. I think the "free play" part would have worked better if there hadn't been that many options at that stage, because the time left was enough to explore just one thing, e.g. butterflies or funnels. The "Sponge" show worked better for such a young child because it was purely visual, and attention was managed by the dancer's choreography. The free play at the end of Sponge also worked better because it was simple, didn't bring expectations of playing in a certain way, and yet offered countless possibilities.

Q4.6 - How could you or the child (ren) you brought to the show interactive experience have been improved?

You can write as much or as little as you want, or choose to skip this question.

How could you or the child (ren) you brought to the show interactive experi...
The only thing I thought afterwards was a song to sing as we moved from area to area. Like a refrain... To signal moving and to create a auditory memory?
As I mentioned earlier, the only think I could think of is letting them play with the torch, this maybe just my son but I felt he got distracted from the story a little. I'd say that the performance could have been a bit longer, but there was an opportunity to stay after the show to explore further.
maybe it was a little unclear whether we needed to keep hold of the little thing from area to area. I was worried we would leave something and then not get the most out of the next space.
Aoife really enjoyed unpacking the basket and the other little girl who was younger did also, baskets to carry items are always popular but there was so much to do it wasn't a problem that there was less of this, maybe a step for the little ones to see into the flower? I am not sure she really followed this as so short!
I thought it was just the right balance

Q4.7 - Overall, at what level were your expectations fulfilled for this performance?



Q4.7 - Overall, at what level were your expectations fulfilled for this performance?

#	Answer	%	Count
1	Far above average	55.56%	10
2	Moderately above average	27.78%	5
3	Slightly above average	5.56%	1
4	Average	5.56%	1
5	Slightly below average	5.56%	1
6	Moderately below average	0.00%	0
7	Far below average	0.00%	0
	Total	100%	18

Q4.8 - If there's anything else you'd like to tell us about your and the child(ren) you brought experiences of The Runaway Hare, please let us know below.

If there's anything else you'd like to tell us about your and the child(ren)...
Felix really enjoyed the experience and I would love the poor to take him to more things like this
I'm not sure how much they understood they were looking for a hare! Their grasp of narrative structure is pretty minimal at the moment, and I don't think they felt that they were 'getting closer' to the goal of finding the hare as the experience progressed.
It was very good, I was surprised by how good it was. My child loved it and it was perfect for her age!
She had a really lovely time - I don't have much to write above because she's a bit young to really remember and refer back to things, but once she got into it, she loved it, especially the feathers and the things around the tree. She took a bit of time to see what was going on, I think tickling the big flower was the first time she really worked out that things were responding to her..
We both enjoyed it - thank you! The performer was lovely and engaging and great with the kids. The 'trail' to follow from the initial room to the performance area was confusing for my 21mth old but everything else was great and the tree in particular seemed to really spark her interest! The hare, when we found him, was beautifully made and I wished she was a little older to appreciate him a bit more :)

Q4.8 - If there's anything else you'd like to tell us about your and the child(ren) you brought experiences of The Runaway Hare, please let us know below.

If there's anything else you'd like to tell us about your and the child(ren)...
I thought the actor was great. She understood children. The lay out of the stage was impressive. People have been impressed when I've shown them pictures of the performance and how good it was for his age group.
We enjoyed the performance and participation in the research! Thank you!:)
I was surprised by how captivated he was by it. I thought the performer was really good and spoke to the children brilliantly
We had a wonderful time thank you very much
It was a delight to watch him enjoy the show