

The Development of Textile Props for the Multi-Sensory Environment to Encourage Touch, Movement and Play

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Abstract

The Snoezelen or Multi-Sensory Environment (MSE) is a unique concept that was developed in response to the limited range of relaxation and leisure activities available for children and adults with sensory processing difficulties, such as autism spectrum disorders and Alzheimer's disease. The environment is furnished with the sensory props, designed to stimulate the primary senses, which are fundamental to the Snoezelen® experience.

Between 2006 and 2008 I facilitated sensory sessions in an MSE and observed the interaction between the individual, the environment and sensory props. As a textile designer I was naturally interested in the design and material qualities of the sensory props and felt bemused that textiles were rarely featured, considering their innate multi-sensory qualities of touch, smell, sight and sound.

Traditionally the MSE often featured textiles and was furnished with sensory props rich in materials chosen for their tactile qualities and sensorial feedback. Today there are a handful of companies who have taken advantage of this niche market and provide the sensory products and the installation of an MSE. With the evolution of new materials the MSE market is immersed in plastic, switch and sensor-activated equipment, which is growing in importance and prioritise the sense of sight where touch is limited to the flick of a switch or push of a plastic button.

With the sense of touch limited to the texture of plastic, the switch-operated equipment promotes passive observation rather than an active participation. This transition raises concerns as to whether the original concept of the MSE is being transformed into a single-sensory rather than a multi-sensory experience. As the design of the MSE evolves, it is important to decipher whether the aesthetics of plastic and switch-activated equipment meet the sensorial needs of the individual.

This research will investigate both low-tech props and the role of textiles in designing for the MSE, seeking to assess whether these are as valid as the current technological prop. I suggest that the textile designer can offer

effective new sensory experiences that are interactive without the added complications of power supply, expense, space availability, or the need for expertise for setting up, maintenance and repair.

Based on my own subjective experience of working in a multi-sensory environment, this MPhil by practice combines historical research into the evolution of the design of the MSE with an experiential account of current practice. My research suggests that the future of the MSE needs to include textile designers if it is to be fully multi-sensory. The research is interdisciplinary, integrating ideas from occupational therapists, educationalists, designers, architects and new media artists, who have explored the areas of sensory stimulation, environmental wellbeing, leisure and play. This interdisciplinary approach is used to generate the knowledge which informs and guides my textile practice, and I bring my experience of work to inform my approach to the theory and philosophy of multi-sensory play environments.

Through experiential accounts of working with service users and with materials, and through an encounter with theories of play, learning, occupational therapy and design, I compare the relative value of the scientific method of data collection and my detailed, personal response to specific individuals and their material environments. I conclude that both methods have equal, and different, value for the designer-maker.

The research aims to inform health care practitioners of the important role that sensory design plays in the education of people with sensory processing difficulties, positively maximizing an individual's experience. I offer a series of design outcomes developed through my practice, and ask whether the design of the MSE can benefit a wider user group, and expand into the design concepts for work, play and domestic environments for those both with and without special needs.

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Author's Declaration

1. During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification.
2. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

A handwritten signature in black ink, appearing to be 'K. Gaudion', written on a light gray background.

K.Gaudion
May 2010

Introduction

One of my earliest memories is of Rondel House, a school in Guernsey for children with special needs where my mother worked. It was the only school of that kind on the island. The facilities were limited so my mother would always be in pursuit of fun and interesting leisure activities for the children, which she admits, was challenging on an Island particularly when the weather was bad.

I was 5 years old at the time and would visit Rondel House after school waiting for mum to finish work. It was great fun. I remember playing with Hannah, she always stuck her tongue out and wanted to hold my hand, but sometimes squeeze it so hard that my mum would have to gently prise her fingers open. I loved to jump in the ball pool where I would find Jack and wondered why he could not walk and was so much smaller yet older than me. Then there was Daniel who scared me a little as he wore a funny hat and would scream and bang his head on things. Tim would laugh and flap his hands as we pushed his wheelchair fast around the room. Most of the children could not speak but that was OK as we communicated through the actions of our bodies and facial expressions, when interacting with the toys and equipment.

These early memories are important for me as they first invited me to wonder what it is like to have limited sight, speech or movement. Even though I may never truly know the answer to this question, this thought has always stayed with me and fuelled much of my work where I have made small attempts to gain and share a little in sight from both science and personal experience.

Similar to, yet not quite as immersive as Patricia Moore's (1979-1982) user research into the world of the elderly¹. My investigation began as far back as A' Level geography for which I hired a wheel chair to experience at first hand the difficulties that arise for wheelchair users whilst shopping in the city of Bath. Following on from this, during my BA Hon's in textiles design I got

¹ Moore, P., Conn, C.P, *Disguised: A True Story* W Pub Group, USA, 1985

involved with a company called Tactile Colour, a print studio which make signs and posters for blind or partially sighted people. This was my first introduction into inclusive design, thinking through the perspective of people with limited sight. Hence, throughout my degree I became more concerned with and interested in the tactile rather than the visual aesthetic quality of my work. I began interviewing people who were blind or partially sighted on the subject to understand how they might decide what to wear considering clothes have such a visual aesthetic. I created textile pieces for a large institution using vibrant colours and textures with the hope of livening up the sterile atmosphere. This raised my awareness of the importance of environmental wellbeing, which is discussed in Appendix one. My final degree work was a collection of ultraviolet reactive sculptures, designed to encourage people to respond in the form of touch, movement and a smile. Which are now being used as tactile pops for the dark room in the Golden Horn, Denmark. (Figs.1-3)

After my degree I continued my textile practice at the Jim Hensons Creature Shop™ within the multi-disciplinary animatronics studio, working in fabrication I collaborated with animatronics engineers to create soft skins for the hard animatronics machinery. I then worked for the charity Kids Active, as a play worker for children with intellectual disabilities (See Appendix 3B-Ben) and continued with my textile practice, always in search of how to create textiles that could be of benefit to people and enrich their lives. Eventually my question was answered when I came across the Snoezelen® or the multi-sensory environment (MSE) through a charity called FACT (Federation for Artistic and Creative Therapy), where I facilitated sensory sessions (2006-2008) for both children and adults and attended two NHS courses to further my understanding of their special conditions (See Appendix 9).

As the MSE culture is growing on an international level the main body of research is found with in the field of occupational therapy and focused on the pressure to provide valid, controlled, empirical data and case studies to prove its therapeutic and medical benefits. Though these case studies on MSEs have been an important resource for this research, the design of the MSE is rarely mentioned. Yet, design is imperative considering it is a combination of

the facilitator and sensory props that shapes the sensory session and the individual's experience.

This practice-led project sets out to identify the gaps between the working methods and concepts of designers and occupational therapists in order to bring the characteristics of the design process, to inform the materials and artefacts available for interactive ambient environments for people with sensory processing impairments, and, particularly, to investigate the role of the designer within the MSE field which is evaluated in chapter seven.

A subsidiary aim of this research is to inform design practitioners of the role that sensorial design holds in the future of both the MSE and environmental/interior design more widely. This aim includes the idea that the 'able bodied' have much to learn from the 'disabled', and thereby challenges the value system which responds to disability with rear and denigration. Chapters eight and nine look beyond the MSE and explore this subsidiary aim of identifying the importance of play, sensory experience and tactility in art and design more widely.

This research is built on experience, interaction and play. It begins with my participation, as a child playing with children at a special educational needs (SEN) school, continues through my experience as a volunteer worker in a MSE with the charity FACT, and results in the two years in which I explore the theory of sensorimotor processing and interactive environments, whilst responding, as a designer, to the needs of the people I worked with. Visiting a number of MSEs across the UK, Holland and Denmark helped me to observe, interpret and document how each MSE may differentiate in terms of design and the user's experience.

In 2008 I collaborated with the interactive design studio, Studio Roosegaarde in Rotterdam in order to gain more experience of electronic, sensor controlled interactive environments. That year I also attended the 2008 International Snoezelen® Symposium in Germany. As a result of this I was asked to participate and develop textiles for the 2009 Snoezelen® Symposium which was held at the most recent MSE development, the Golden Horn in Denmark. This 'commission' to design and construct an interactive interior for people

with sensory processing impairments is the work that I present for examination in this practice-led research. Together with a collection of occupational textile props developed through observation and research during years of experience, documented in chapter ten. The occupational props are to be used with in an MSE to encourage touch, play, movement and the development of an individual's stereognostic sense ². The conclusion of this practice-led research raises several important questions for future research and development, which will create a framework of discussion for my workshop at the 2010 International Snoezelen ® Symposium in Alabama, USA.

In 2005 the first MSE installed in Guernsey at Le Rondin School & Centre, for approximately 150 children with learning difficulties and more profound and multiple disabilities. I showed my mum who had only wished that there had been one in Rondel House all those years ago.

² When we touch something as we move, two sensations are mixed up together – tactile and muscular, giving rise to that sense which the psychologists call the “Sterognostic sense”. Montessori. (1958) Maria Montessori (2nd ed), Madras, India: Kalakshetra Publications, translated by Mary A Johnstone. 163

The Snoezelen® or Multisensory Environment (MSE)

Cleland and Clark first developed the concept of the MSE in 1966 with a collection of sensory rooms described as a 'sensory cafeteria' (see Appendix 1A). From this early approach the Snoezelen® concept was being developed across Holland in a number of institutions, firstly 'Haarendael' in 1974 to promote relaxation, later in 1978 'Piussord' introduced the concept at a 'Play' themed conference and simultaneously De Hartenburg Institute was experimenting the concept in their summer fetes with activities tents (Figs. 4-5) which later developed into the first permanent Snoezelen® in 1983.

Two Dutch therapists, Ad Verheul and Jan Hulsegge from De Hartenburg coined the term 'Snoezelen'® derived from two Dutch words, the verb 'snuffelen' - to seek out and explore - and 'soezelen' - to relax. They are responsible for its on going success. The Snoezelen® trademark is now owned by the company ROMPA who is one of the leading Snoezelen® manufacturers, so today it is often referred to as the multi-sensory environment (MSE).

"In principle Snoezelen stimulates the five senses and aims at finding new ways of approaching people who due to their severe mental impairment are generally not capable of articulating independently. With our help Snoezelen wants to give these people the opportunity to choose activities for themselves. That is where Snoezelen originated from: How can a person with multiple disabilities 'communicate' with his environment?" ¹. Ad Verheul (2007)

The emphasis placed on 'leisure' was a major breakthrough, as traditionally leisurely pursuits were limited to television and art and crafts, which were quite often beyond the individual's capabilities and comprehension.

There is no 'hard and fast' definition of the MSE. This quite possibly demonstrates the 'organic' nature of the environment, which is responsive and unique to each individual, and its development, which has evolved through individual intuitions and experiments as much as through scientific protocols.

¹ Verhuel, Ad, (2007) Snoezelen Materials Homemade: Holland, Ad Verheul. 6

Cavet, J, who is a Senior lecturer in the department of social sciences at the University of Staffordshire. Dundee, described the MSE as 'a collection of devices that offer sensory stimulation, some of which have been specifically designed for people with severe or profound and multiple disabilities'².

One of the major objectives of the MSE is to elicit non-verbal interaction by using various sensory stimuli through such designs as bubble tubes, projectors and fibre optics to encourage multi-sensory stimulation and cross-modality sensory stimulation.

The purpose of multi-sensory stimulation was defined by Caldwell (1991) as, a way of finding a particular stimulus which will increase the individual's interest to a level where the desire to respond is more powerful than the barrier of his or her handicap. When this is achieved, the individual will begin to explore things outside of his/her own world, and interact more with the environment³.

From my observational research, (see Appendix 3B & 4,) I can confirm Caldwell's hypothesis. In the MSE individuals often gravitated towards the sensory props that were reactive and which displayed a variety of sounds and movements in response to their actions. These reactive props often activated the individual, prevented them from falling asleep and reduced stereotypic self-stimulatory behaviours (SSB), such as hand flapping, rocking and spinning. In support of this Shapiro et als (1997) study compared the short-term efficacy between the 'Snoezelen®' and a 'playroom' for children who exhibit maladaptive behaviours. The differences they noted between both environments was that, 'in the Snoezelen the stimuli are constant, predictable and long lasting. This seems to give the child the necessary time to absorb the surroundings. In the playroom the stimuli change without prediction⁴.' Their study concluded that, 'the Snoezelen is an effective therapeutic setting for short-term

² Cavet, J. (1994) 'Multisensory environments Snoezelen- your questions answered', *Community Living*, 7 (3), 26

³ Caldwell P.A. (1991) 'Stimulating people with profound handicap. How can we work together?' *The British Journal of Mental subnormality*, 37 (3), 92-100.

⁴ Shapiro, M, Parush, S, Green, M. et al (1997) 'The efficiency of the 'snoezelen' in the management of children with mental retardation who exhibit maladaptive behaviours'. *The British Journal of Developmental Disabilities*, 43, 140-155. (150)

reduction of SSB and facilitation of adaptive behaviours in children with moderate to severe mental retardation' ⁵.

From my research experience I have observed that the MSE offers individuals choice, control and sensory stimulation that they otherwise may only receive during basic care such as washing and eating. It also can provide an interactive experience for the less mobile, who spend long periods facing the same spot in a room or looking at the ceiling because they are unable to move themselves to change position. Sarah Bailon et al's (2005) study on 'Variability in response of older people with Dementia to both snoezelen and reminiscence', illustrates several key studies indicating further potential benefits of the MSE. These include a decrease in sadness, fear and boredom (for example, Moffat et al 1993, Pinkney 1997, Johnstone and Finnegan 2000, Baker et al 2001), an increase in the patients' attentiveness to their environment (Moffat et al 1993, Spaul et al 1998, Baker et al 2001), increased appropriate communication (Baker et al 2001), improved wellbeing (Sansom et al 2002) and reduced socially disturbed challenging behaviour (Kragt et al 1997, Spaul et al 1998, Johnstone and Finnegan 2000, MacDonald 2002)⁶.

The development of the MSE

Since the late 1970s, the MSE has expanded into an international phenomenon, and gained a presence in hospitals, care homes, day centres, mainstream schools and prisons. In 2005 an accident and emergency department of a New York hospital installed a MSE to relax the staff and health insurance companies in Holland finance the construction of MSEs in peoples domestic environments.

With more knowledge and research surrounding the senses, leisure, play and wellbeing in the field of occupational therapy, its user-base continues to

⁵ Shapiro, M, Parush, S, Green, M. et al (1997) 'The efficacy of the 'snoezelen' in the management of children with mental retardation who exhibit maladaptive behaviours'. *The British Journal of Developmental Disabilities*, 43, 140–155 (154)

⁶ Baillon, S. Diepen, E. Prettyman, R. Rooke, N. Redman, J. Campbell, R. (2005) 'Variability in Response of Older People with Dementia to Both Snoezelen and Reminiscence', *British Journal of Occupational Therapy*, August, 68(8), 367-372 (367)

expand and diversify. The MSE is widely used within dementia care, maternity, management of chronic pain, adult psychiatry, stroke and traumatic brain injury, paediatrics, children with special needs and adult learning disabilities.

Measurement

Professor Krista Mertens runs the Institute for Rehabilitation Sciences at Humboldt-University, Berlin, which is the only academic institution to have installed a MSE for research purposes. Prof Mertens is a leading figure within the MSE field and in 2008 published her book '*Snoezelen –in action*' which focuses on practical training tips and explains that, 'the Snoezelen generates a sense of well-being and has relaxing effects; it instils peace in a person; but it also activates; it kindles interest; it directs and organizes the stimuli; it brings back memories; it organizes a person, it helps to overcome fear and anxiety and offers security; it can guide a person; it fosters and promotes relationships; and is simply enjoyable' ⁷.

In 2002 both Ad Verheul and Prof Krista Mertens founded ISNA (the International Snoezelen Association), that coordinates research, practitioners, experts and current thinking surrounding the MSE, with an annual International Snoezelen symposium that attracts 24 nations and grows in significance every year.

The MSE originally regarded as a leisure environment has now expanded into the realm of education and therapy. This is accompanied by continuing pressure to provide valid empirical research data to prove its benefits. Yet, leisure activity is important and quite often the primary occupation for people with severe disabilities as expressed by Hogg and Cavet (1995).

'People with profound intellectual disability and multiple physical and /or sensory impairments have, until the past decade, been particularly disadvantaged in their access to leisure. This situation reflects not only the complexity of their needs and out failure to appreciate what they require to enhance the quality of their lives, but

⁷ Mertens, K. (2008) *Snoezelen-in Action*, Germany: Shaker Verlag Aachen, 27

perhaps a too exclusive concern with their therapeutic, medical and education needs, initially justifiable after decades of neglect' ⁸.

To understand the MSE as a form of leisure and relaxation as legitimate ends in itself you simply have to imagine life removed from all leisure pursuits to realize the importance it has on our wellbeing and quality of life. Though able-bodied people are easily able to go to the cinema, shopping, read a book or visit a friend, this is not always available for those with disabilities, who are quite often dependent on others.

Helen Mounts head of language and communication at Mont Varouf school in Guernsey and Judith Cavet senior lecturer in social work at Staffordshire University, both express that 'the popularity of multisensory environments has highlighted the need for leisure provision for people with profound and multiple disabilities that incorporates well resourced environments, sensory stimuli and a recognition of the value of pleasure for its own sake' ⁹.

The definition of 'proof', as evidenced through quantifiable data acquired through empirical tests using scientific methods, continues to inform much scholarly research on MSEs as providers of pleasure, recreation, leisure and wellbeing. However, this MPhil research by practice is concerned with design for the MSE and its findings based on my personal account and experience of the multisensory environment. That pleasure is a quality whilst science concerns itself with quantifiable data is a paradox that has informed, but not inhibited, my practice as a designer.

I propose that my subjective understanding of an individual's unique mode of non-verbal communication, such as blinking, slight sound, movement of the head, and witnessing their smiles, joyous sounds and excitable movements with in the MSE, is enough 'data' for me to confidently continue my research by design practice. This is on the basis that the MSE does improve an

⁸ Hogg, H, Cavet, J. (eds) (1995) *Making Leisure Provision for People with Profound Learning and Multiple Disabilities*, London: Chapman & Hall, IX

⁹ Mounts, H, Cavet, J. (1995) 'Multisensory environments', in: Hogg, J, Cavet, J. (eds), *Making Leisure Provision for People with Profound and Multiple Learning Disabilities*, London: Chapman & Hall, 67-85 (82)

individual's quality of life and wellbeing through the enigmatic relation between sensory experience, relationship and play.

It is the designer's skill of being willing to sense an individual's sensory response, partly through identification, empathy and experience as well as through professional training and research, which enables the designer to make use of this qualitative knowledge through design practice. This complex contradiction, between the scientific value of empirical data, which permits quantifiable knowledge in order to make claims for generalized facts, and the designer's experience of working with individual's responses, raises fundamental questions about the value of qualitative rather than quantitative research.

Though the function of the MSE has expanded into the realm of education and therapy this research will focus on its original concept; the provision of leisure. To understand the significance of leisure, sensory stimulation and environmental wellbeing appendix 1A draws on studies of institutionalised care in the 1950s and 60s, which reveals the effect a sensory deprived environment and a life devoid of leisure activity can have on a person's mental and physical wellbeing.

Leisure and Play = Wellbeing

Leisure, play and wellbeing are three inter-connected components of the MSE; a form of *leisure* activity that encourages *play*, which promotes *wellbeing*. “*Snoezelen* does generate well-being and has a relaxing effect. It calms people down, but also activates. It awakens interest, it guides and puts stimuli into order it awakens memories, organises a person, takes fear away and creates safety. It can guide a person, it binds and supports relationships, it is simply fun”. (Roger Hutchinson (2004)¹

There is much research into leisure, play and wellbeing, although there seems no universal consensus for the meaning of each. The theories range across medical, social, historical and aesthetic disciplines. This chapter briefly addresses each component in the context of the MSE.

PLAY

With one word denoting, simultaneously, the process of playing musical instruments, the process of dramatic performance, sporting activities, rituals, children’s spontaneous process of learning, and adult ludic activity. The concept of play is complex and multi faceted. The fact that one word is still used, colloquially, to encompass all these processes indicates the extent to which our culture has neglected to pay serious attention to the phenomenon of play. Easily, and wrongly, dismissed as the antithesis of ‘work’ it is especially troubling for the Protestant ‘work ethic’, but play has, in the twentieth century begun to be understood as a profoundly symbolic and cultural process, with central importance for the evolution of the human brain.

The 20th century social theorist Johan Huizinga, in *Homo Ludens* (1938) defined species as playing animals and suggests that play is the foundation of culture. Similarly, twentieth century anthropologist Gregory Bateson in *Steps to an Ecology of Mind* (1972) suggest that play is universal to all ‘feedback loop’ mechanisms such as the human mind, and therefore to the capacity for relationship.

¹ Hulsegge, J, Verheul, A. (2005) *Snoezelen Another World*, Derbyshire: ROMPA® Ltd, 8

The MSE is an environment furnished with multi-sensory props and equipment that initiates play activity for both adults and children, with unusual sensory processing patterns. The sensorial qualities of the play materials trigger curiosity and activate the mind and body. Play motivates activity, as individuals independently explore and navigate their immediate world through movement, and their primary senses.

Amongst occupational therapists, play has been described as 'exploratory in nature, and consisting of a variety of activities that involve movement and manipulation in relation to the environment' (Robinson, 1977; Sutton-Smith, 1967)². Bundy, A.J (2005) Professor of occupational therapy at Colorado state University, expressed that playmates, objects, space, and qualities of the sensory environment are critical aspects for inclusion in an of environmental supportiveness for play.³

As illustrated in chapter four 19th century educational developments such as Maria Montessori and the Kindergarten movement placed much importance on play for a child's development. Play was also central to the research conducted by the child psychologists Melanie Klein (1882-1960) and Donald Winnicott (1896-1971). Klein's development of 'the psycho-analytic play technique' in which she expressed, Play for the child is not "just play' It is also work⁴ and Winnicott's research surrounding the 'transitional object' together support the important role of play and toys. For psychoanalysts since Freud play is understood as the opposite of reality, as the childhood equivalent of work, and as the basis for all forms of symbolic exchange where an equivalence between different sensory experiences, imaginative ideas and symbols paves the way for language use, inter subjectivity, and full social agency and responsibility.

² Stagnitti, K. (2004) 'Understanding play: The implications for play assessment', *Australian Occupational Therapy Journal*, 51 (1) March 3- 12 (3)

³ Bundy, A.C. (2005) 'Measuring play performance', In: Law, M, Baum, D, Dunn, W (Eds), *Measuring occupational performance supporting best practice in occupational therapy* (2nd ed) US: Thorofare, NJ: Slack Inc, US 129-149 (139)

⁴ Segal, H (1979) Klein, London: Fontana Modern Masters, 36

In their writing on *play materials*, Carol Onvry and Suzie Mitchell express that 'for people with profound and multiple disabilities suitable resources and conditions for play may have to be provided before the latent need, desire, interests and sheer effort required for play can be activated. The more complex a person's disability, the more individually designed their playthings may need to be, and the greater the attention that must be given to the context in which is to happen in order to cater for their play needs' ⁵. Onvry and Mitchells response reconfirms my thoughts and observations that unlike able-bodied people, individuals with disabilities may find it difficult to independently initiate imaginative, transformative, narrative, imaginative, spontaneous, and social or object play activity. Consequently the type of play activity they experience is dependent on their interaction with the play worker together with the play worker's choice of toy and the design and sensory feedback of that toy.

Maria Montessori's experience of teaching children with disabilities enabled her to learn and make comparisons between their educational needs and play abilities to that of able-bodied children. In which she expresses that:

"The basic difference between a normal child and one who is mentally inferior is that when they are placed in front of the same objects the deficient child will not show a spontaneous interest in them. His attention must be continuously aroused: he must be invited to observe and encouraged to act". ⁶

Similarly In the book *Toys and Playthings* (1979) Newson, J and Newson, E, describe their observation between a blind and sighted child and their interaction with a toy ball ⁷. The description reveals that the sighted child

⁵ Ouvry, C, Mitchell, S. (2006) 'Play Materials', in: Hogg, J, Cavett, J. (Eds), *Profound and Multiple Impairment: Making Leisure Provision*, London: Chapman and Hall 176-196 (181)

⁶ Montessori , M. (1973) *The discovery of the child* (2nd Ed) translated by M.Joeseph Costelloe, US: Fides Publishers, Inc, 178

⁷ A sighted baby with a ball will swipe and follow it, throw it and clamour for its return (making herself understood by 'eye-pointing'), and drop it into a box or basket. The blind child dares not let the ball roll away from her lest she lose it completely, or will she drop it into a box, for she cannot see containers and therefore cannot 'see' their possible uses. Even if she is prepared to let go of the ball; while the sighted will gain this stimulus by alternatively exploring visually and bringing the toy into contact with the environment (throwing, scraping, banging and so on), the blind child turns inward towards herself for this second stimulus, and bites or licks the ball, or rubs it against her face or eyes. Newson, E, Newson, J, Allen, G (1979) *Toys and Playthings: in development and remediation*, London: Unwin ltd, 146

immediately utilises its physical properties and actively bounces, rolls and throws it. But the blind child does not let go and explores the sensory qualities of the ball and engages with the haptic experience of licking and rubbing it against his/her skin.

Toy Design

New materials, new technologies and the changing demands and needs of children have influenced the evolution of toy design. Starting from the handmade and mechanical using natural materials such as wood and textiles, to the mass-manufactured synthetic toys made of plastic (Figs.6-8) and the toys of today powered by mains power, batteries, electronics and computers. (Figs.9-15)

As discussed in chapter six the evolution in materials and new technologies is evident in the MSE where the simple low-tech props of the past are being undervalued and where the complicated remote control, switch operated and single sensory screen based activities are taking the lead. Though they both hold advantages and disadvantages it is important to consider whether the simplistic low-tech playthings will offer similar and better play experiences to the high-tech play equipment, which can be expensive and high-maintenance.

From my observations the low-tech playthings often hold multi-sensory properties, for example a sheepskin rug holds the properties of warmth, touch, weight, sight and smell. In contrast to this the switch-activated props, for example the infinity tunnel light panel, offers single sensory stimulation with emphasis on sight where the individual becomes a passive observer rather than an active participant. As Winnicott stated '*Playing is doing*'⁸ and it is important that the '*doing*' or active nature of play is not lost.

It is important that the play equipment is both physically and mentally compatible with the complex needs of the individual. For a person whose cognitive abilities who are at a sensorimotor stage of cognitive development, the multi-sensory nature of the plaything is important, as it is through their

⁸ Winnicott D.W. (1971) *Playing and Reality*, New York: Routledge, 41

primary senses and motor skills that helps them to interact with the world around them.

LEISURE

Leisure, associated with adults is an activity that we independently choose outside working hours, involving active or passive engagement, that offers a form of entertainment and enjoyment, for example shopping, going to the cinema, playing sports, and hobbies such as gardening, reading and socialising. Historical examples of cultures that valued leisure activities can be found in the excavations of Roman cities in which the daily visit to the baths, as a complex form of socialising, relaxing, exercising, personal grooming and political networking, indicate that leisure far predates capitalism.

Individuals with disabilities are often unable to participate in work due to their physical and mental needs and capabilities and with this 'leisure' is often their primary occupation. In Judith Cavet's (1995) investigation on *leisure provision in Europe* she begins her writing with a powerful quote expressed by a Belgian doctor about the needs of people with profound and multiple disabilities, 'They have to have leisure or they are not living'⁹. Consequently for individuals with disabilities the important meaning and positive implications attached to leisure may exceed that of able-bodied individuals.

The MSE has made a major contribution towards the provision of leisure for individuals with intellectual disabilities, who may otherwise face difficulties participating in the leisure activities experienced by more able-bodied individuals. As expressed in chapter two the user base has diversified and it is developing into a universal leisure activity that is non-age or gender specific.

The rapid aging population has instigated a new direction of research concerning the elderly. Occupational therapists are investigating the MSE as a potential leisure resource for individuals with dementia and neuropalliative condition. Early research by Philip Woodrow (1998) on '*Interventions for*

⁹ Cavet, J. (1995) 'Leisure provision in Europe', in: Hogg, J, Cavet, J. (eds) Making leisure Provision for People with Profound Learning and Multiple Disabilities, London: Chapman & Hall, 50-64 (49)

confusion and dementia 3: reminiscence’ expressed that ‘a trigger for interactive reminiscence can be anything that stimulates the senses, e.g. touch, taste, sight, smell, and hearing ¹⁰.

Research conducted in 2007 by Delong, M, Wu, J and Baq, M, titled ‘*May I Touch*’ ¹¹ compared early touch experiences of female respondents in Chinese and American universities. The study highlighted the important relationship between touch and memory and interestingly the results revealed that early memories of touch were often associated with the fur of animals and textiles such as blankets and bedding. These studies suggest that the MSE could also be a suitable environment for reminiscence therapy in which textiles could play a major role.

It was interesting to speak with the occupational therapist Dr Lesley Collier from Southampton University about her latest MSE research. (See Appendix 6A) Lesley is investigating ‘*Multi-Sensory stimulation to improve functional performance in moderate to severe dementia: interim findings from a randomised single blind trial.*’ Though not yet published the study compares participant’s reaction and performance between the leisure activities of gardening and the MSE. In which it reveals that the functional performance in people with moderate to severe dementia is greater in the MSE¹².

Also an observational study by Cohn-Mansfield, J et.al (1992) focused on the residents in a nursing home who were severely cognitively impaired and investigated the relationship between agitated behaviours with occupation. The data analysis revealed that ‘residents manifested less agitation when they were involved in structured activities (those designed to hold the residents attention)

¹⁰ Woodrow, P. (1998) ‘Interventions for confusion and dementia 3: reminiscence’, *British Journal of Nursing*, 7 (19) 1145-1149 (1148)

¹¹ Delong, m, Wu, J, Saq, M. (2007) ‘May I Touch it’, *Textile*, UK: Berg, 2(3), 328-347

¹² Collier, L, McPherson, KM, Ellis-Hill, C. Staal, J, Bucks, R.S. (2009) ‘Multi-Sensory stimulation to improve functional performance in moderate to severe dementia: interim findings from a randomised single blind trial’. (Not as yet published)

than when they were unoccupied in which residents were engaged in no activities during 63% of our observations¹³.

With the growing concern that most nursing home residents with dementia have a problem with inactivity and boredom, the MSE could prove to be the important leisure resource for people with dementia. It is therefore a unique platform, which warrants playthings, which are non-age or gender specific that appeal to both children and adults.

WELLBEING

In 1961 physician Dr. Halbert Dunn (1896-1975) published a small booklet entitled "High Level Wellness". Dr. Dunn saw 'wellness' as a lifestyle approach for pursuing elevated states of physical and psychological wellbeing¹⁴. This dispels the idea of the medical condition of our bodies, and curing the body as the main priority for human wellbeing, by highlighting the important condition of our minds and our emotional state. This sense of wellbeing also relates to Buddhist teaching on meditation, as described in the book *Change your Mind: a practical guide to Buddhist Meditation*: 'meditation concerns not the mind so much as the body, although this is really just a way of talking, as you can't separate the two. They are not two separate systems operating together, but two ways of talking about the one system which is us'¹⁵.

The MSE with its focus on the activation of the mind and body exemplifies this notion of wellbeing. A recent study by Hutcheson et.al, (2010) '*Promoting mental wellbeing through activity in a mental health hospital*', reveals that activities

¹³ Cohen-Mansfield J, Werner P, Marx M. (1992)' Observational data on time use and behaviour problems in the nursing home', *Journal of Applied Gerontology*, 11(1) 111-121 (119)

¹⁴ Ardell, D. (2000) What is wellness? [Online] seek wellness, available from: http://www.seekwellness.com/wellness/articles/what_is_wellness.htm [Accessed 3 February 2010]

¹⁵ Paramananda. (1996) *Change your Mind: a practical guide to Buddhist meditation*, Birmingham: Windhorse Publications, 11

such as sports, art groups, music, dance groups and badminton promotes mental wellbeing for patients in acute psychiatric wards¹⁶.

Though not a medical term, wellbeing is a concept that is beginning to receive much attention in healthcare, design (ergonomics), architecture, psychology and education. For example in 2007 Anthony Seldon the headmaster of Wellington College, Berkshire introduced 'Wellbeing' as part of the school's curriculum, suggesting that, 'Children are born with our bodies, yet schools do not provide our young with an "owners' manual" on how their bodies, minds and emotions work. We now have the information on "positive psychology", and schools such as my own, Wellington College, are teaching well-being or happiness in association with academic institutions¹⁷. State schools have replaced 'civics' with 'citizenship, social and personal development'.

Play, Leisure and the Elderly

There are two significant events which may have played an important role in changing attitudes towards play, and put play into the framework of the Government Programme 'Every Child Matters' that instigated the development of 3,500 new or refurbished play areas in the UK between 2008 and 2011¹⁸.

These events both took place in 2009 and include the Kindergarten Crisis Report which was released by the Alliance for Childhood¹⁹ and the e-petition sent to number 10 Downing Street which expressed, 'We the undersigned petition The Prime Minister to make the provision of play services a statutory

¹⁶Hutcheson, C, Ferguson, H, Nish, G, Gill, L (2010) 'Promoting mental wellbeing through activity in a mental health hospital', in: *The British Journal of Occupational Therapy*, March, 73 (3) 121-128

¹⁷ Seldon, A. (2007) Don't Worry, be Happy (online) The Independent on Sunday, available from: <http://www.independent.co.uk/opinion/commentators/anthony-seldon-dont-worry-be-happy-463031.html>, (Accessed March 2008)

¹⁸ The Play Strategy, department for children, schools and families, (2003) Every child matters, London [online], available from: <http://www.dcsf.gov.uk/everychildmatters/> [Accessed 10 June 2009]

¹⁹ Crisis in the Kindergarten, why children need to play in school (2009), The Alliance for childhood [Online], available from: www.allianceforchildhood.org [Accessed 10 Feb 2010]

obligation for local authorities in the UK²⁰.

The reform in ideas about play has opened up design opportunities and in 2008 a 156 page document was released; *Design for Play: A guide to create successful play spaces* which was funded by the National Lottery and supported by the Department for children, schools and families document²¹. The revival of interest in the traditional toy was marked in 2005 with a succession of exhibitions. The 'Philosophical toy' exhibition was held in Apexart, New York, which displayed original Froebel Gifts. *Kids Size: The Material World of Childhood* was organised by the Vitra Design Museum in Germany. In the same year Marina Warner curated the exhibition *Only Make-believe: ways of playing* at Compton Verney. These exhibitions are interesting as they combined both traditional and contemporary play objects that drew together the important social, psychological, historical and educational aspects of play and impact on creativity.

Though toys are still often associated with children, toys for adults are not a new phenomenon. The company Google use Lego and play activities in their office space (Figs.16-18) and whose innovative interior designs are not so dissimilar to the interior design of Kindergarten Schools. (Figs.19-29)

With a rapidly aging population toy manufacturers in Japan are responding to this by expanding the age range of toys for the over 60s. MSE manufacturers in the UK too have begun to expand their age range, the MSE manufacturer, Spacekraft launched a catalogue *SpaceKraft Generations 2010* which advertises games, sensory playthings to encourage relaxation and reminiscence for the older generations and the ROMPA® catalogue 2010 has a seven page section for older adults.

In 2004 the first nursing care prevention playgrounds were developed in Japan, which are in essence play grounds for the elderly. The UK launched

²⁰ Number10, (2009) Play-Right-epetition Response [Online], London, available from: <http://www.number10.gov.uk/Page18922> [Accessed 12 February 2010]

²¹ Department for children, schools and families (2008) [online] London, available from: www.teachernet.gov.uk/publications [Accessed 12 Feb 2010]

this initiative in 2008 with the development of a *pensioner's playground* in Blackley, Greater Manchester. (Figs.30-32) A year later the Tate Modern exhibited interactive works by Robert Morris, whose work itself became an adult playground (Figs.33-38) and resembled much of the equipment used for Sensory Integration Therapy as described in Appendix 1B (Figs.39-42).

The *pensioner's playground* received positive media attention and Westminster City Council has donated 40,000 pounds for a *pensioner's park* to be developed in Hyde Park for the spring, 2010.

Following on from the large toy companies Fisher Price (1930) and Mattel Inc (1945) in 1957 Charles Lazarus launched the world's first toy superstore Toys "R" Us. Toys "R" Us played a critical role in the area of special needs toys in 1993 they partnered with the not for profit organisation National Lekotek Center (NLC), which provides information, advice and training on play and toys for children with special needs. And together they published the first "Toy Guide for Differently Abled Kids" which is still being updated and used today.

ERFAHRBAR¹

Didactic Materials: The Multisensory Environment

The MSE originated in response to the lack of leisure amenities for individuals with disabilities. It places great emphasis on experience, interaction, play and stimulation of the primary senses. Refuting the Cartesian tradition of the antithesis between mind and body the MSE represents a unique space of embodiment that combines both mind and body, where activation of the body at times takes precedence over the mind. Many individuals who enter the MSE are non-verbal, therefore the haptic and bodily experience of the sensory props and materials becomes an important mediator and mode of communication between the facilitator and service-user.

From my own observations I have witnessed that for individuals who are blind and partially sighted the sensory props can create an important haptic-vision that helps them navigate through their surrounding environment. Also, the sensory props that hold interesting feedback, textures and behaviours such as vibration, movement and noise can activate the body and capture the attention of individuals with limited mobility, who enter the environment in a more passive state and are, at times, prone to falling asleep (a side-effect of their medication). (See Appendix 3B& 4)

Individuals who have sensory dysfunctions in one or more sensory modalities, such as sight, may then develop superior perceptual abilities in the other sense modalities of touch and sound, which then become their main focus and method of communication. For example, without the distraction of sight the musicians Ray Charles and Stevie Wonder may not have developed their exceptional sense of sound. The American author Helen Keller (1880-1968)

¹ 'In German, the word erfahrbar means understanding something physically as well as intellectually: to explore, discriminate and interpret reality through the senses. Luescher, A (2006) 'Experience Field for the Development of the Senses: Hugo Kukulhaus' Phenomenology of Consciousness', *International Journal of Art and Education*, Feb, 25 (1) 67-73 (67)

both blind and deaf, found touch was an essential tool leading her to grasp the concept of symbol, language and communication and thus to communicate in the world around her. Touch is also important to animals and plants, for example, cats, Manatees and Venus Flytraps (*Dionaea muscipula*) have special hairs and whiskers, which help them to detect and navigate through touch and vibration. In humans the sense of 'proprioception' the sense of the position of the body in space is dependent on the balancing system of the inner ear and its tactile sensors. Sound waves resonate through the body and are experienced as corporeal resonance.

Didactic materials: Schools

Emphasis placed on the inter-activation of the body and mind is found throughout educational philosophy in which Johann Heinrich Pestalozzi (1746-1827) and Dr Edward Seguin (1812-1881) developed innovative teaching methods.

Inspired by the philosopher Jean-Jacques Rousseau (1712-1778) and his book on the philosophy of education *Emile*, Johann Heinrich Pestalozzi (1746-1827) developed the Pestalozzi Method. The Pestalozzi method involved object lessons (*Anschauung*) where the experience of objects such as pebbles and apples with their sensory properties of form, shape, sound, texture and weight encouraged learning without spoken words. Pestalozzi expressed, "Our first teachers of philosophy are our feet, our hands and our eyes"².

Dr Edward Seguin (1812-1881) developed teaching methods for children with special mental and physical needs such as deafness. Seguin's method was, 'To lead the child as it were by the hand of the education of the muscular system and that of the nervous system and the senses'.³ After twenty years experience his methods were published in the US, 1866, titled 'Idiocy and its treatment by the physiological method'.

² Froebel, F. (1889) *Autobiography of Friedrich Froebel*, translated and annotated by Emilie Michaelis and H Keatley Moore, Syracuse, N.Y W Bardeen Gutenberg, 90

³ Montessori, M. (1958) *Maria Montessori* (2nd ed), translated by Mary A Johnstone, Madras, India: Kalakshetra Publications, 32

Both Pestalozzi and Seguin had a profound influence on educational theories in the 18th and 19th century and inspired new paths of pedagogical action such as The Kindergarten and the Montessori method, whose teaching methods are still being practiced today. Their teaching methods emphasised the importance of play and action for a child's learning and development of which an important ingredient was direct observation and object handling which led to the development of special sensory materials and objects.

The German Crystallographer Friedrich Froebel (1782-1852) founded The Kindergarten in 1837. After a diverse working career of woodwork, farming and architecture he chose pedagogy and trained in The Frankfurt model school, which was based on the teaching methods of Pestalozzi.

Influenced by Pestalozzi's object lessons and utilising his own wood work skills and background in crystallography of understanding form and shape, Froebel designed educational materials and physical objects of his own known as 'Froebel gifts' also referred to as 'philosophical toys' or 'occupational gifts'. 'In short sessions of directed play, the gifts were used to create pictures or structures that fit loosely into three fundamental catalogues – forms of nature (or life), forms of knowledge (or science), and forms of beauty (or art)' ⁴.

Froebel created up to twenty gifts which took on geometric shapes of spheres, cylinders and cubes that involved wooden building block, slats, knitted balls, wooden sticks, cocktail sticks and encouraged the activities of building, constructing, weaving, drawing, sewing and pricking. (Figs 43-44)

"He envisaged that the gifts will teach the child to use his (or her) environment as an educational aid; secondly, that they will give the child an indication of the connection between human life and life in nature; and finally that they will create a bond between the adult and the child who play with them" ⁵.

Interestingly, early Utopian sociologists such as Charles Fourier (1792-1837) and Robert Owen (1771-1858) always included the kindergarten schools as

⁴ Brosterman, N (1997) *Inventing Kindergarten*, New York: Harry N. Abrams, Incorporated, 37

⁵ Liebschner, J. (2002) *A Child's Work: Freedom and Guidance in Froebel's Educational Theory and Practice*, Cambridge: Lutterworth press, 82

an important element to their co-housing projects Falanstere and Parallelogram.

Following on from Froebel the Italian pioneer of child development studies, Maria Montessori (1870-1952) between 1898-1900 worked in Rome with children with special needs. Montessori was influenced by Seguin and applied his teaching principles,

“Seguin’s voice seemed to me to be that of the prophet crying in the wilderness, and my mind was overwhelmed with the immensity of the importance of a work which might reform the school and education”⁶.

Like Froebel, Montessori too developed her own ‘materials for development’ consisting of blocks, cubes, pink tower, bells, constructive triangles and geometric insets. Montessori’s experience with disabled children influenced the design of the materials where importance was placed on their sensory data and feedback. As part of her teaching method Montessori would blind fold the children whilst handling the objects and materials to heighten and develop their stereognostic sense ⁷. (Figs 45-48)

“The principle agent is the object itself and not the instructions given by the teacher. It is the child who uses the objects: It is the child who is active and not the teacher. Any object that we wish to use for the duration of the senses must necessarily present many different qualities such as weight, texture, colour, form, size and so forth, Montessori also stated that, ‘It is not enough that a thing should be interesting in itself but that it must lend itself to the motor activity of the child if it is to be interesting to him” ⁸.

Montessori’s child-centred and child –led methods also extended to the classroom, where she began to adapt the classroom environment to the child

⁶ Montessori, M (1958) Maria Montessori, translated by Mary A Johnstone, Madras, India: Kalakshetra Publications, 34

⁷ When we touch something as we move, two sensations are mixed up together – tactile and muscular, giving rise to that sense which the psychologists call the “Stereognostic sense”. Montessori, M. (1958) Maria Montessori, (2nd Ed), translated by Mary A Johnstone, Madras, India: Kalakshetra Publications, 163

⁸ Montessori, M, (1973) Maria Montessori: The discovery of the child, translated by Costelloe, S.J. US:Fides Publishers, 149

needs. She banned school desks and replaced doors with curtains, which not only softened the environment but also alleviated the problem of children not being able to reach the doorknobs.

After her experience in Rome, Montessori diverted her teaching methods to able-bodied children, where she expressed, "Slowly I became convinced that similar methods to normal children would lead to a mental awakening and a beneficial modifying action in them also"⁹.

The philosophies of Montessori and Kindergarten have acted as important springboards, which at a conscious or sub-conscious level, directly or indirectly, have influenced further research surrounding play, materials and experiential learning. Further educational movements have arisen. Such as the Austrian philosopher Rudolf Steiner's development of the Steiner Waldorf School in 1919. Two years later F.T. Marinetti developed the educational scale of Touch and Tactile boards that were created for *The Manifesto of Tactilism in 1921* (See Appendix 10) in which textiles features highly. The Montessori method of blindfolding also influenced tactile workshops by Metta Gislon and Bruno Munari (1907-1998) in the mid 1980's (Figs.49-54)

Today there appears to be a rehabilitation of our senses in education, in 1988 UK based educationalist Flo Longhorn published *A Sensory Curriculum for very special People: a practical approach to curriculum planning*. This together with her sensology courses has facilitated a multi-sensory approach to educational practice particularly within SEN (special educational needs) schools.

The Kindergarten movement has also had a great influence within the field of art and design for example the influential artists and architects Wassily Kandinsky (1866-1944), Piet Mondrian (1872-1944), Le Corbusier (1887-1965), R. Buckminster Fuller (1895-1983) and Frank Lloyd Wright (1867-1959) were all educated in the Kindergarten. Their early exposure to form and geometric shapes of the Kindergarten 'Gifts' had a great influence on their Art

⁹ Montessori, M (1958) Maria Montessori, translated by Mary A Johnstone, Madras, India: Kalakshetra Publications, 25

and Design practice (Figs.55-58). Frank Lloyd Wright reflects on his experience at Kindergarten,

“The smooth shapely maple blocks with which to build, the sense of which never afterward leaves the fingers: So form became feeling. These primary forms were the secret of all effects...which were ever got into the architecture of the world”¹⁰.

The exhibition ‘Inventing Kindergarten’ was curated in homage to Fredrich Froebal at The Alyce de Roulet Williamson Gallery, California. This was curated by Margaret Wertheim, director of the ‘Institute for Reconfiguring’, together with the architect Norman Brosterman with his immense personal collection of Kindergarten ‘Gifts’.

Instantly we can draw many parallels between these early educational movements with the concept of the MSE, where physical materials and objects play a vital role for the encouragement of self-directed play and action. It is therefore not surprising to hear of the MSE being installed within Kindergarten schools. The didactic materials of the past were developed through intense observation; the next chapter will explore how the design of the MSE has been developed and whether it follows the trait of user centred design.

¹⁰ Lloyd Wright, F. (1943) Frank Lloyd Wright an autobiography, New York: Duell, Sloan and pearce, 34

The MSE and Design

Between 2006 and 2008 I undertook voluntary work as a play worker with a charity called FACT (Federation for Artistic and Creative Therapy), which housed a specially adapted MSE and sensory bus (Figs.59-60). FACT provided multi-sensory programmes for children and adults with a variety of disabilities and once a week we set up a sensory corner ad hoc in the assembly room of a local school. The sensory programmes were designed to mitigate sensory deficits by stimulating and nurturing all of the primary senses, separately or together. This was through the combination of music, lighting effects, aromas, soft play and tactile equipment. My first encounter with a MSE was in February 2006 (See Appendix 3A) I experienced the bubble tubes, waterbed, projectors and fibre optic strands, which I later discovered is the standard sensory equipment found in most MSEs.

Admittedly my first visual impression of the MSE was one of bemusement with the twirling disco ball and vibrating bubble tubes. Initially I could not take the environment seriously. However once I began facilitating multi-sensory sessions with both children and adults on a one to one or group basis, I soon experienced and observed its potential benefits. Most of the individuals I worked with were non-verbal yet had their own unique modes of communication and expression, which at times were as subtle as blinking or slight sound or movement of the head. With the aid of FACTs 'sensory profile' form (See Appendix 8C) and intense observation I tried to understand, interpret and document any difficulties, limitations and preferences people might be experiencing with both the environment and the equipment (Figs.61-63) See Appendix 3-4).

Each session lasted for one hour and observing the sessions from the perspective of a textile designer I was naturally drawn to and interested in the interaction and response between the individual, the environment, materials and sensory props. It soon became clear that the props and equipment were tools that formed an important multi-sensory interface and mediator between the facilitator and the participant.

I used drawing and creative writing (See Appendix 4C& 3B) as a means of recording my observations and devised my own observational charts that documented any difficulties that arose with design solutions idiosyncratic to the service-users' needs. (See Appendix 4A-B) I began to notice that the standardised equipment was made of plastic and felt that there was a severe lack of choice in materials and textures, and accordingly I was unable to facilitate a variety of tactile experiences for the service-users.

I observed that with much of the standard switch-activated technologies such as the bubble tubes and interactive panels, movement and touch was restricted to the finger and stimulation was focused on sight. The affect of the switch-operated equipment also substituted human contact as there was less opportunity for interaction between myself and the participant, this supports Woodrow's research on *'Interventions for confusion and dementia 3: reminiscence'*, where he describes, 'Interaction with machines can be a dehumanizing process and is a poor substitute for human contact.'¹

Without a multi-sensory interface the MSE would not function, and my observations reveal that design and the choice of material is a fundamental component of the MSE, which has the power to influence an individual's sensory experience. This chapter assesses the MSE in terms of design, adding something new to the existing body of MSE research, which is largely focused on producing empirical data for proving its therapeutic value within the field of occupational therapy. From the quantitative 'data' to this more descriptive account of the quality of the interactive sensory experience, both methods are necessary for research.

The chapter is a description following the design of the MSE; how it evolved, where it stands today and what the future holds. As part of my research I visited a wide spectrum of MSEs, from the original MSE at De Hartenburg in Holland, to those commonly found in Special Educational Needs (SEN) schools and day care centres in the UK. This includes the charity Sunfield in the west midlands, Locksheath day centre in Southampton, the Spa School,

¹ Woodrow, P (1998) 'Interventions for confusion and dementia 3: reminiscence' *British Journal of Nursing*, October 7(19) 1145-1149

Kintoreway children's nursery school, Krisharan day school and the Victor Hugo Ward at Goodmayes hospital all based in London through to the most recent design development, The Golden Horn, in Denmark.

Design Inspiration

Three pioneering figures whose work have influenced or simultaneously relate to the design of the MSE are the Danish psychologist Doctor Lily Nielsen, the German designer and theorist Hugo Kukelhaus (1900-1984) and Professor Jim Sandhu Singh.

Dr. Lilli Nielsen was one of seven siblings, four of whom were blind. She undertook research on education for children with visual impairments and multiple disabilities. Between 1983-1990 Dr. Nielsens PHD research was based on the design and development of "Little Room™". Dr. Nielsen expressed, "I designed the "Little Room" hoping that it would provide the visually impaired child with a frame of reference concerning spatial relations and thus facilitate the child's learning about the outside world".² Little room™ mirrors the concept of the MSE holding all the key components, consisting of a metal frame (an environment) with a variety of suspended objects and materials (sensory interface), so that a child can independently reach out and explore and touch the materials. Dr. Neilsen's first commercial Little Rooms™ came out in approximately 1991 and interestingly the MSE manufacturer ROMPA® have begun to replicate Little Room™ and advertise it in their catalogues under a different name the 'be active box'. (Figs. 64-65)

Hugo Kukelhaus based his observations on his own children, similar to Frobel and Montessori. Kukelhaus too designed and developed didactic sensory toys called *Allbedeut* (all things, all meanings) which won numerous awards which enabled the child to' build a new structure again and again from simple basic forms. The simpler the form the more meanings it can suggest for the child as new

² Nielson, L. (1992) Spatial Relations and the 'Little room' Future Reflections, National Federation of the Blind, Maryland: spring 11 (2) (online) available from: <http://www.nfb.org/images/nfb/Publications/fr/fr11/Issue2/f110214.html> (Accessed 10 Dec 2009)

experiences suggest new relationships' ³. Later, Kukulhaus extended his work to the sensory qualities of our environment and its impact on human development:

“The development of humans is optimally promoted from the environment one diversity of properly-proportioned attractions, physical and social conditions and factors-the multi-formity of the environment is the living condition”⁴.

In 1967 Kukulhaus's project 'Sensorium' was featured in the world exhibition EXPO in Montreal, which was referred to in Ad Verheuls book '*Snoezelen Handmade Materials*'. Sensorium involved a collection of 37 'experimental stations'. Each visitor would be blindfolded and would walk barefoot, engaging actively with the objects found in the stations to rediscover their neglected senses of touch and smell. These experimental stations were reminiscent of the first physical MSE experiment, the activities tent, referred to in chapter five. 'Snoezelen®' and sensorium are both names connected to the input of sensory stimulation, and at this level the two concepts are related.

Lastly in 1973 Prof Jim Singh Sandhu created the course *Design for the Non-Average* at the polytechnic of central London School of Architecture. Between 1972 and 1994 Sandhu and his team focused on three centres and looked at ways to improve and enrich the environments for children with special needs because, '...little emphasis has been laid on design to help compensate for motor and sensory deprivation and to facilitate the close contact of staff and children. It is on this area of design that we wish to concentrate'.⁵

The book *Environmental design for the Handicapped* (1976) was an important outcome of this research which offered criteria, methodologies and guidance for designers and architects. One of the design outcomes was the mobile teaching cubicle designed in response to the practical difficulties of inclusion

³ Luescher, A. (2006) 'Experience Field for the Development of the Senses: Hugo Kukulhaus' Phenomenology of Consciousness', *International Journal of Art & Design Education*, 25 (1) February, 67-73 (70)

⁴ Kukulhaus, H, Lippe, R.Z. (1982) *Entfaltung der Sinne*. Frankfurt am Main: Fischer Taschenbuch Verlag, 12

⁵ Sandhu, J.S, Henriks-Jansen, H. (1976) *Environmental Design for the Handicapped Children*, Polytechnic of Central London: Saxon House, tockfield Ltd, 45

policies that required 'structured teaching has produced an urgent need for one-to-one spaces, specialised teaching environments and time-out rooms' ⁶. The mobile cubicle consisted of a carpeted platform that could be lowered or raised, partitioned with curtains, furnished with hanging mobiles, activity boards and tactile panels. The cubicle was a multi-sensory environment in the making with conceptual and physical bases similar to those of the MSE, which was launched in Holland in 1983. Interestingly today the MSE is evolving into a less static and more mobile environment with design outcomes that run on similar lines to the mobile cubicle. (Fig.66-68)

Like Lilli Nielsen, Sandhu's early works such as the inflatables, activity boards and tactile panels too have been replicated, standardised by MSE manufacturers and feature widely in most multi-sensory environments. In the mid 1960s Sandhu and his colleague Roger Hayden designed and developed large, transparent inflatable tubes, which through observing children's interactions revealed to induce to play activity, with their unique lightweight and mobile qualities. The tubes enticed touch and movement that came alive through just a simple action and lightest touch of the body, which enabled the children with even the most minimal amount of movement to participate in play activity. As well as being a 'plaything' the inflatable tubes also created a safe, immersive environment. Similar in concept to Verner Pantons *Phantasy landscape* (1970) and more recently Alan Parkinson's *Luminarium* (1992) (Figs.69-70), the inflatable tubes too offered 'a way of transforming a room of hard surfaces and sharp corners into a billowing 'sea' of air and membrane: a place to roll, bounce, swim, push and prod in, to experience the power of lifting huge shapes with ease- and to share these excitements with others'. ⁷ (Figs.71-72)

Later Sandhu developed tactile panels and activity boards created with simple every day materials, such as rubber, foam and felt chosen for their tactile qualities. These props became a form of haptic-communication for the children encouraging them to, 'feel, describe and express like or dislike of certain

⁶ Sandhu, J.S, Henriks-Jansen, H. (1976) *Environmental Design for the Handicapped Children*, Polytechnic of Central London: Saxon House, tockfield Ltd, 137

⁷ Sandhu, J.S, Henriks-Jansen,H. (1976) *Environmental Design for the Handicapped Children*, Polytechnic of Central London: Saxon House, tockfield Ltd, 143

shapes, textures, sounds and images'.⁸ (Figs.73-74). These early works featured in the first ever exhibition of 'toys for the handicapped', curated by Sandhu and Hayden in 1971 at The Royal College of Art.

The MSE at De Hartenburg, Holland

De Hartenburg Centre was built in 1968 in 85 hectares of pinewood forest originally providing accommodation, care and support for 440 severely disabled adults and today home to 210 residents and to the world's first permanent MSE. (Figs.75-76). As explained in chapter two the MSE evolved after the development of an activities tent, which was set up in 1978. The tent involved sensory experiences that included a ventilator blowing balloons and shreds of paper. A corner of soft cushions with homemade metal chimes, a light screen that projected your own shadows, a water pool with foam that reached the height of 2 metres, a black box filled with slim, a corner filled with 400KG of straw and a tactile path which you walk on bare foot or wheelchair over the different textures.

As Ad Verheul explained in his presentation at the 2010 Snoezelen Symposium (See Appendix 2E), the activities tent received a positive response particularly from the parents of the residents. As it was the first time they saw their child move and react to their environment.

The first permanent MSE was 200 square foot and built in 1983 to provide a permanent leisure and relaxation resource for the centre's residents. During its time of development there were no companies that manufactured MSE equipment and materials, consequently De Hartenburg evolved organically furnished with low-tech props, handmade from materials chosen for their tactile and sensorial qualities that created true 'multi' sensory experiences, that were designed around the residents' through observing their sensory needs and capabilities. For example Ad discovered the bubble unit whilst watching a music group on television and felt that it be a fantastic visually stimulating prop for the residents of Solund. It was not until he observed

individuals who are blind and partially sighted interacting with the bubble – tube, who began to touch and experiencing the vibrations that he realised it was also a great tactile prop for those without sight.

The success of the MSE led to the development of small MSEs within the residents' homes, in the belief that sensory stimulation should not be restricted to just one room, but that it was important to enrich the sensorial surroundings of the residents' domestic environments. In 2000 the permanent MSE was extended by approximately 200 square feet and continues to be used today from between 80-140 people on a daily basis. It is thanks to De Hartenburg that the MSE has now received international attention.

As part of my research I went to meet Ad Verheul in Holland and to visit the MSE at De Hartenburg to observe and experience it for myself. Upon entering I was immediately conscious of the tactile quality of the environment, Ad was very proud to show me the original handmade props, which still held a prominent place, and were largely constructed of textiles. These included 50cm woollen pompoms, mobiles and tactile pillars made from tennis balls, soft foam, wool, strings, sponges, carpet, brooms and leather. (Figs.77-79) Ad continues to promote homemade sensory props in his publication *Snoezelen Materials Homemade* (2007) and his workshop at the 2009 Snoezelen Symposium was titled, *How to build your own Snoezelen equipment*. (Figs.80-81) (See Appendix 2E)

The entire space of the MSE was utilized removing any divisions between the walls, ceiling and floor. It presented a truly immersive space that could be enjoyed from all bodily positions and optimized from all perspectives and angles. This concept is reminiscent of Verner Panton's organic interior landscapes and Ernesto Neto's immersive works that encourage the participant to explore the work through their bodies. (Figs.82-84)

The MSE comprised of a large sensory corridor, (Figs.85-87) and two large rooms containing a ball pool (Figs. 88-91), a waterbed, a vibrating floor home made with loud speakers and liquid projectors made from the motors of vacuum cleaners (Figs. 88-91) as well as a light and heat reactive floor (Figs.

92-95). All of these early props and equipment can be likened the work of contemporary interactive artists and interior designers of today.

Though there were hints of screen-based, sensor and switch-activated equipment, De Hartenburg has managed to sustain a healthy balance between the material-orientated props of the past, and the switch and sensor controlled equipment of today. The low-tech/no-tech props may appear crude in design (Figs.96-99) when positioned next to the interactive sensors and flashing lights, but the cheap, low-maintenance, battery-less and wireless handmade props of the past still continue to be used 27 years later. This for me provides evidence that a successful MSE need not be filled with expensive technological equipment but the simple props rich in form, texture and materials are equally as effective.

Other MSEs

In 1987 the first MSE in the UK was installed at Whittington Hall, North Derbyshire, offering six sensory environments for children and adults with intellectual disabilities, designed and developed with the company ROMPA®, now one of the leading suppliers of MSE equipment (See Appendix 7). This new facility stimulated many anecdotal case studies, and in 1991 at the end of its first twelve months a report was published titled 'The Whittington Hall Snoezelen Project', by Roger Hutchinson.⁹

The MSE movement has since grown on an international level. 2005 saw the development of two remarkable MSE facilities, the Orange Grove Snoezelen® centre in Tennessee and the 11,000 square foot Lacey A. Collier Snoezelen® complex based in Florida. Orange Grove doubles as a research platform whose aim is to move beyond individual qualitative research to more quantitative studies. The research coordinator, Dr. Rick Rader claims, "High on the research agenda is the actual measured physiological response to various sensory scenarios. As we progress with the design of various research projects we will strive to employ a multitude of established parameters that will hopefully lead to

⁹ Hutchinson R. (Ed) (1991) "The Whittington Hall Snoezelen Project: a report from inception to the end of the first twelve months, Chesterfield: ROMPA®

the use of the Multisensory Environment as a stabilizing feature in the educational milieu”¹⁰.

The psychiatric department of Springfield Hospital in London this year (2010) has invested a large sum of £15,000 for the installation of a MSE. The department incidentally recognised the importance of touch for their clients through the intervention of animal therapy. It has also been confirmed that The Lord Taverners’ charity has teamed up with BT, a sponsor of the 2012 London Olympics, and are investing £400,000 to create 12 new “sensory areas” across the UK. In response to this Dominic Tinner, Head of Development at the Royal School Manchester expressed,

“For some of our children, the experience of the sensory room will stimulate reactions not witnessed before by teachers and carers.”¹¹

The investment of funding for the development of such MSE facilities proves that besides the lack of empirical evidence to prove its benefits, the MSE has a strong following, which people are willing to invest in.

MSE visits

In contrast to the large and expensive MSE facilities noted above, my research is concerned with MSE similar to that at FACT commonly found in care homes, day care centres, SEN schools and hospitals.

I visited four organisations all of which have had an MSE installed with in the last four years. These include the Kintoreway children’s nursery (MSE-A), Krisharan day school for children with special needs (MSE-B) the Spa School for children with Autism Spectrum Disorder (ASD) (MSE-C) and Sunfield school and residence for children with ASD (MSE-D). (Figs. 100-103).

¹⁰ Flaghouse, Inc, The Snoezelen® Center at Orange Grove [online], available from: <http://www.snoezeleninfo.com/orangeGrove.asp> [Accessed 19 February 2010]

¹¹ Media Intelligence Partners Ltd (Feb 28 2010) Press Release: New £400,000 therapy rooms programme to help disabled children (online) Media Intelligence partners Ltd, (available from) <http://www.cisionwire.com/media-intelligence-partners-ltd/press-release--new--400-000-therapy-rooms-programme-to-help-disabled-children> (Accessed March 23 2010)

The following observations are based on my conversations with the teachers (See Appendix 6B-C) and comparisons made between the four MSEs in terms of design and how they are being used.

In contrast to the MSE at De Hartenburg, switch-operated equipment, plastic and PVC featured highly with in all four MSEs. An uninviting atmosphere was invariably created with the combined effect of heat radiating from the equipment and the smell of plastic. One teacher reported that one of the pupils would not enter the MSE because he could not tolerate the smell of the PVC and found the lights too bright.

There was little if no evidence of sensory props and those that were available were hidden away or out of reach in a separate box, which contained props limited in textures made of hard plastic or wood, or a mixture of the two, with on average one prop made of textiles. (Figs.104-106) The ceiling in each MSE was left empty devoid of any visual or sensorial stimulation, apart from switches and lighting apparatus. (Figs.107-109)

Initially the facilitators were keen to demonstrate their new impressive switch-activated equipment, yet on many occasions were unable to do so as they were still unfamiliar with how it worked. They expressed that difficulties arose with the equipment in terms of maintenance and training, a facilitator complained that their interactive floor had been broken for over 3 months, but due to shortage of money and staff it had not been mended. (Fig.110)

Currently training in the UK on how to use the MSE is limited and mainly provided by the MSE product manufacturers such as ROMPA® and educational programmes with in occupational therapy. Though some organisations organise their own guidelines, such as The Victor Hugo Ward in Goodmayes Hospital, London (See Appendix 8B), the training and use of the MSE has not yet been standardised. Consequently with mixed standards in training and no set regulations it was of no surprise that on two occasions the facilitator had turned on all of the equipment at the same time. This can create an environment that is in danger of over-stimulation, which can have a very negative impact on the users' experience.

All of the MSEs were being used for different reasons, MSE-B was used as a reward mechanism. A pupil was rewarded 10 minutes in the MSE for good behaviour. In MSE-A the children were entitled to one sensory session hour, which was incorporated into their timetables. MSE-C rented their MSE facility out to neighbouring schools and even provided sensory suitcases for parents so that they can carry and construct a sensory space into the child's home environment. (Figs. 111-117)

The Golden Horn, 2009

Thirty years later the International Snoezelen® Symposium in Denmark launched the Golden Horn, the most contemporary MSE facility of our time. (Figs. 118-121) The Golden Horn has ten sensory rooms consisting of vibro-acoustic ball pools, sound activated massage beds, vibro-acoustic waterbeds, a giant projected volcano and several themed rooms (Figs.122-128). All of which are remarkably similar to the office spaces found in the company Google. (Figs. 129-135). With 'contemporary' comes new digital technologies, and on entering the Snoezel house you are visually bombarded with a curved flat screen that is embedded into the floor and snakes its way along the entire corridor and expensive digital flat screens and interactive projections that line the walls. (Figs.136-138)

Though technology is the main ingredient there is an appreciation of materiality in which I was commissioned to design textiles for the six alcoves positioned directly outside the sensory rooms. As discussed in chapter ten I developed a series of interactive panels titled '*Tip-Tap Touch*' that were suspended from the ceiling (Figs.139-140). In contrast to the surrounding digital technologies, Tip-Tap Touch celebrates simplicity and the unique engineering of materials posed within the traditional toy, the Jacobs ladder. Powered through touch the blocks create a visual illusion where they appear to cascade down the ribbon, which is actually the result of one block flipping after the other. The panels create an intriguing non-intrusive truly multi-sensory experience that stimulates, sound, touch, sight smell and movement.

With a more integrated society the closure of De Hartenburg is looming and The Golden Horn has been appointed as the head office for ISNA (International Snoezelen® Association) (January 2010). With this healthcare practitioners and parents may soon feel compelled to develop a MSE similar to that of The Golden Horn. However, without the capital or space to accommodate even a fraction of what The Golden Horn has to offer, this could prevent them from doing so.

I presented my MPhil research and practice at the symposium to thirty-seven health care practitioners ranging from occupational therapists, music therapists, physiotherapists and psychologists, including Professor Paul Pagliano of James Cook University, Townsville, Australia and Prof. Dr Krista Mertens the founder of ISNA. After the presentation I was approached by occupational therapists that were interested in future collaborations. Through conversation it became obvious that collaboration between the skills of a designer combined with the knowledge of an occupational therapist associated with human functioning, person-environment connection and disability would create a powerful platform for doctoral research concerned with universal and human-centred design. (See Appendix 2B& C)

Conclusion

I conclude that it would be extremely difficult to create a standardized design for the MSE that is idiosyncratic to everyone's needs and abilities. Considering this, it is difficult for me to understand why the majority of the MSEs I visited look the same, furnished with identical equipment that (for want of mains power) line the walls, such as the bubble tubes, waterbeds, projectors, interactive panels and fibre optics.

As a consequence the large scale and static nature of this standardised equipment has become the trademark and permanent feature for most MSEs today. With such a strong presence the equipment dominates the environment, which shapes the atmosphere and the users' initial impression and experience that priorities the sense of sight and warrants the smell and the haptic experience of plastic.

It is only until the play worker delves into the sensory box of low- tech props that the MSE experience begins to shape around the abilities of each individual. Reflecting back on a sensory session with Dom it was the sheepskin rug I took from the sensory box, which transformed his experience and level of comfort (See Appendix 3B-Dom). If these props were large in scale maybe they too could be part of the furnishing and add something new to the existing standardised equipment.

It is important to consider that a multi-sensory experience need not be in the confine of the four walls of an MSE but can be experienced anywhere. The teachers in some of the schools I visited had enriched their classroom experience with homemade props. One teacher adapted her classroom by suspending pink fabric to the ceiling as she new one of her students loved the colour pink. The teacher capitalised on the natural sensory elements from outside by suspending the fabric in front of a window so when it was open it would move in response to the breeze. (Figs. 141-144).

It is important that the sensory box is recognized as a crucial component of the MSE experience. Currently it is undervalued with a limited choice of props, all of which are largely plastic based. MSE manufacturers are selling 'complete' sensory boxes where by all of the props are plastic. (Fig.145-146) Though it is partly the responsibility of the designer to provide a range of props and equipment that offer a wide range of sensory feedback, it is also the expertise and responsibly of the play worker to make the right choice and choose the props that meet their clients needs and abilities.

Standardised training is important, I visited a residential home once a week in the sensory bus and was shocked to discover that they had an MSE that was not being used. After speaking to the care workers they explained that they did not know how to use it and neither did they have the time, which is why invited the sensory bus. The implementation of sensory profiles for each client is also important and will provide the valuable information to design and create more bespoke sensory experiences. An instant MSE cannot be created but has to develop organically to the needs of the user.

Future Design Recommendations

Low-tech

With integration and deinstitutionalisation it is important that a MSE can be adapted for use within any context and environmental setting, particularly that of a domestic home. This allows the MSE to be brought to the user. Considering this, the standardised static MSE of today has many limitations that prevent it from being adapted into a domestic environment, with space and the financial implications of the purchase and maintenance of the technological equipment being the key issues.

These factors support the low-tech approach, with handmade materials and equipment, particularly using textiles, which naturally lends them towards the sense of sight, touch, sound and smell, putting the 'multi-sensory' back into the MSE experience. These are just as effective as new technologies, but without the financial, space and maintenance implications. Whilst there is concern surrounding fire safety of these materials, Ad Verheul promoted a fire resisting impregnating agent, supplied by D-Secour European Safety Products GmbH that can solve these safety issues.

Mobile

Having worked (2006-2008) in a sensory bus I began to realise that the traditional static MSE is quite often not practically and economically viable, largely due to lack of space and the room may prove to be difficult for some people to access. Therefore mobility and adaptability are critical to the future design of the MSE. The Hackney Play bus is a play scheme in London, which was set up in 1972 that also recognised the importance of mobility that supports add-hoc play sessions. The drive towards mobile sensory props is evident in the product market with the development of the sensory trolley, sensory suitcase and sensory props that can be experienced within the comforts of an individual's own environment. Similarly the little bags given on long distance flights could be classified as a mobile sensory pack with eye patches, eye plugs, socks, toothpaste all designed to balance the comfort of your sensory thresholds whilst on a flight.

Flexible

Mike Ayres Designs is one of the leading UK based design companies within the MSE field, which has developed the concept of the Sensory Studio®. In contrast to the original MSE, the Sensory Studio® is a black canvas which gives the facilitator the opportunity to choose and arrange the right props and equipment that are relevant to the needs, abilities and sensory preferences of the individual who is about to enter, preventing any unwarranted stimuli.

Ayres promotes it on his website as follows: 'a Sensory Studio® is an environment in which you can experiment with and exploit lots of physical materials and low-tech experiences.'¹²

Sunfield School has employed this concept in the children's living areas, which accommodates a small empty room, where props and equipment are brought out according to meet the needs and abilities of the individual. The concept of the Sensory Studio® supports the idea of bespoke mobile sensory props.

This further supports the hypothesis that qualitative research into the individual's relationship to specific sensory environments has a significance that cannot be supplanted by generalized deductions drawn from quantitative data.

¹² Mike Ayres Design [online], available from:
<http://www.mikeayresdesign.co.uk/index.php/studios.html> [Accessed 7 February 2010]

The MSE and Technology

In this chapter I discuss my ambivalence towards the indiscriminate use of digital technologies within MSE design, and suggest that a tactile-led multi sensory interactive relationship between user and environment, readily created through textile design, is more valuable than an optical (flashing light) experience.

With its success the MSE has become a commercial interest, providing opportunities for a handful of manufacturers and suppliers. They appear to be the sole providers for design, installation and direction of the MSE concept. As the MSE has continued to expand and grow so too have standardized props and equipment to meet the market demand. With new developments in technology their products have diversified into the realms of switch and sensor activated digital technologies such as audio-visual, sound-light activated and motion-controlled equipment. This transition from sensorial low-tech to the visually stimulating high-tech MSE comes at a high expense. There is additionally a need for space, power supply and maintenance, which prioritises hard plastic materials and limits the sensory experience to just vision.

ROMPA®

To understand whether the growing market demand is substituting quality over quantity of MSE products? I analysed the products supplied by the MSE manufacturer ROMPA®. ROMPA® is the market leader in the design, manufacture and installation of multi-sensory environments. The company was formed over twenty years ago and contributed towards the design and develop of the UK's first MSE at Whittington Hall, Derbyshire (1987).

Now the current owner of the Snoezelen® trademark, ROMPA supplies over 8,000 products to more than 600,000 customers worldwide¹, all of which are advertised in their glossy catalogues. To understand their product range I

¹ ROMPA®, a sense of place (online) NHS 60th Anniversary book-ROMPA® Article, (available from): <http://www.theconstructioncentre.co.uk/companies/rompa-ltd/1539/> (Accessed Jan 3 2010)

listed the material and sensory value of 481 sensory props with in twenty-four sections of the Spring/Summer 2010 ROMPA® catalogue. (See Appendix 7)

The results of this, coupled with my own personal observations and conversations with teachers and healthcare practitioners expressed in chapter six confirmed my initial thoughts that the majority of products available in the MSE market are plastic (73%) with only 23% featuring textiles. These figures reveal that although the stimulation of touch (36%) featured highly alongside sight (40%) it is not just touch but the quality and haptic experience of touch that needs to be considered. Only 16% of their products stimulated sound and a mere 2% smell.

Though there were slightly more low-tech props compared to mains or battery powered props, it is important to consider that much of the low tech products were small hand held props which are often stored in boxes to the side of the MSE. It is the mains powered switch activated equipment that visibly furnishes the MSE such as the bubble tubes and interactive wall panels.

The catalogue itself revealed how the material that constructed the prop can affect the users' experience. The textile props encouraged movement, group activities and a haptic experience that encompassed all of the body (Fig. 147). Whilst the hard, plastic, switch-activated props, restricted movement and the body remained static apart from the head and fingers, which did not invite group participation (Fig. 148). Which raises some important questions.

Whilst this new 'impressive' MSE may offer the technological aesthetics, which are currently considered attractive, how much of this aesthetic is of value to an individual with intellectual disabilities? Are the original concepts of the MSE still being embraced? Is the motivation for technology becoming the driving force for the environment, rather than the fulfilment of the sensory needs of the user? It could be argued that technology is enabling us to create situations for unique experiences that could not be realized otherwise. For example, a simple flick of a switch can enable anyone even with a minimal amount of controlled movement to interact and experience an immediate response from the equipment. However, can this be considered 'multi-

sensory'? What are the benefits of an interaction, over time, with a responsive environment, which connects sound, sight, touch and movement without the use of digital circuits? Is 'the flick of the switch' not just restricting the interaction and sense of touch to instantaneous response from the finger and if so how is this supporting the development of the Body Scheme?

Technology and Methodology

Some of the interactive technologies found in the MSE have many connections with the growing trend of responsive environments within 'mainstream' architecture and interior design. In 1991, the immersive IMAX cinema, The CAVE was designed by Tom Defanti and Dan Sandin, which is a virtual space consisting of three screens that surround the body with images. (Figs.149-151) The French architect Jean Nouvel in 2003, designed the walls in the Hotel Peurta America's 8th floor lobby, (2005) which projects colours in response to motion using sensors.

Similar to The CAVE environment, the project Mediate began in 2002 at the Centre for Responsive Environments at Portsmouth University. Mediate is a portable interactive and responsive environment for children with autism spectrum disorders, it represents an impressive virtual/digital environment driven by intelligent sensor-controlled technologies. (See Appendix 3B)

Mediate illustrated to me what a technology-led environment devoid of materiality would feel like. The flat interfaces featuring motion sensed screens creating an intimidating, alienating, one-dimensional empty space. One of Mediate's objectives was to stimulate the three senses of vision, smell and touch, though there was the smell of plastic, for touch there were no materials or textures to lure and impel my hands and body forward. The visual dominated in this impressive but overwhelming environment. (Figs. 152-155)

The project came to an end in 2005 and Mediate was never finished, largely due to difficulties in finance, space, maintenance and technical support. For me, Mediate raised several key questions and concerns regarding digital

technologies that are important to consider, before the MSE gets completely immersed in a world of technology and gadgets.

For example; can these 'invisible' sensor controlled technologies be too alienating and complex for an individual who is at a sensorimotor stage of cognitive development? What does the high-tech equipment offer that low-tech/no-tech equipment can't? Can virtual technologies substitute the haptic experience of real textures and materials? How much of the design is like the nineteenth century 'solutions' to disability and difference, or in fact a defensive response to the 'able bodied' subject's anxiety? Is the superfluity of 'flashing lights' technophilia a symptom of the desire to 'silence' the needs of the user? Without replicating the 'moral panic' that emerged with the rise of TV, and the anxieties that it was used as the 'glass pacifier' by harassed mothers, it is legitimate to ask whose needs are being met by the proliferation of digital technologies embedded within MSEs today?

These questions, together with the research and approach involved in the development of Mediate, highlight the important role of materiality and the haptic experience of textiles, which cannot be replicated through technology.

Presenting my MSE Research at the Plastic Electronics Conference in Dresden 2009 revealed to me that the application and the user are quite often an afterthought (See Appendix 2D). It is more often than not the case that innovators will apply their new technologies to the needs and wants of more able-bodied people. Considering this it is partly the responsibility of the designer to educate and steer new technologies into a positive direction, that address the needs and capabilities of the extreme user whose needs and wants are often not being met.

Technology has its benefits, for example Assistive Technology (AT) such as wheelchairs, hearing aids, text telephones have had a positive impact on individuals lives and wellbeing. As new technologies are being developed, so too are projects such as Aurora at MIT, which is utilising robotic technologies as a means of therapy for children with autism. Gordon Pask's Conversation

Theory would be useful for any future developments in sensory and interactive technologies within the sphere of MSE.

Tactile Technology

Designers are exploring the possibilities of virtual touch questioning whether it can become an alternative mode of communication and substitution for real touch, for example non-flush toilets. The mobile phone for example is continuously undergoing development. Nokia's 'haptikos' touch screen, for example, when pressed mimics the sensation of a conventional keyboard. US Company 'Immersion and ComTouch' is investigating vibration as an alternative means of communication, for expressing emotion through the mobile phone. Media artists Christa Sommerer and Laurent Migonneau are two of many designers responding to these ideas with their project 'Mobile Feeling', consisting of wireless objects that enable people to communicate through virtual touch and body sensations including smell and sweat. Virtual touch raises many questions about whether technology can really substitute for our sense of touch and emotion.

Opposites Attract

As part of my research I was interested to work with an interactive designer whose main medium of work was new digital technologies, in order to ascertain what skills a textile designer could bring into collaboration. I worked for the Interactive Designer Daan Roosegaarde at Studio Roosegaarde for three months in Rotterdam (2008) (Figs.156-160).

Initially, as a textile designer joining a team of engineers and electronic programmers, I was a little intimidated. I was worried about what a textile designer could bring to this studio of sophisticated, intelligent technological equipment of chips, sensors and screens. The answer soon became apparent when I was left feeling a little bemused as to why Studio Roosegaarde

referred to their installations as 'interactive' (See Appendix 3D). It was the motion of a participant that activated the sensors, which generated the behaviour, and movement of the installations, all physical contact was removed. There was a void, an empty space or invisible barrier between a sculpture and myself. I might have been controlling its behaviour but I did not 'feel' that I was. Without having physical contact I did not feel engaged. I could have touched it, but the heavy, hard, grey industrial materials did nothing to tempt me.

At Studio Roosegaarde I experimented and played with materials. Using textile processes such as weaving I combined hard/heavy and soft/light industrial materials to create interesting tactile surfaces and skins, which could animate the behaviour and movement of the sculpture further to invite touch.

Though textiles and digital-technology appear to be diametrically opposed with contrasting properties, in a sense *opposites attract* and a number of interesting projects are acknowledging this. Textile artist Mette Ramsgard Thomsen unites Robotics and textiles with her work Robotic Membranes. The Tangible Media Group at MIT's Media Lab have developed Super Cilia Skin (SCS) as an interactive surface that is designed to envelop objects with the invention of engaging vision and touch. The aim of SCS is 'to bridge the intangible world of digital information with the physical world'². The Tangible Media Group suspects that the absence of interesting textures in many of today's technological devices may be due to the absence of textual interface. We look forward to a future in which designers can literally weave interactivity into the fabric of our environments'³. (Figs.161-164)

² Raffle, H, Tichenor, J, Hiroshi, I. (2004) *Super Cilia Skin: A Textural Interface*, *Textile: The Journal of Cloth and Culture*, 2 (3), Autumn 2004, 328-347 (20) 337

³ Raffle, H, Tichenor, J, Hiroshi, I. (2004) *Super Cilia Skin: A Textural Interface*, *Textile: The Journal of Cloth and Culture*, 2 (3) Autumn, 328-347 (20) 346

The role of the designer for the MSE

The Japanese graphic designer and curator, Kenya Hara, explains 'Design originates in society. The essence of design lies in the process of discovering a problem shared by many people and trying to solve it. Because the root of the problem is within society, everyone can understand plans for solutions and processes for solving the problem, in addition to being able to see the problem from the designer's perspective. Design is appealing because the process creates inspiration that is engendered by this empathy among human beings in our common values and spirituality' ¹.

Kenya Hara's description of design as a means of trying to solve problems shared by people within society relates to the role of occupational therapists and health care practitioners, whose practice is to serve problems and improving the health and wellbeing of individuals. For a designer, these problems are solved through the adaptation and development of new and existing physical matter, creating the infrastructure and skin of our internal and external environments.

With a more integrated society ergonomic design for people with disabilities is an important tool that has the potential to solve the problems individuals may experience which help to ensure that their environment can be modified and adapted to accommodate their mental and physical needs and capabilities. This approach can simultaneously create universal design solutions. An example is the OXO range of Good Grips kitchen tools, originally designed for people with arthritis. Another is the architect Rem Koolhaas/OMAs Floriac House, completed in 1998, which was designed around the needs of the father who was confined to a wheelchair. (Figs.165-166)

Based on the idea that everyone's sensorial behaviours are on the same continuum of responses if the designer focuses on the needs of the extreme user. Who may experience a more intense and amplified sensorial responses to that of an able bodied person. The end product will naturally fall under the umbrella of universal design.

¹Hara, K. (2007) *Designing Design*, Switzerland: Lars Muller Publishers, 24

The concept of an ergonomic universal design approach was evident in 1919 in the Bauhaus prospectus, which reads:

‘Our job is therefore to invent a new system of education that may lead – by way of a new kind of specialised teaching of science and technology- to a complete knowledge of human needs and universal awareness of them. Thus our task is to make a new kind of artist, a creator capable of understanding every kind of need: not because he is a prodigy, but because he knows how to approach human needs according to a precise method. We wish to make him conscious to his creative power, not scared of new facts, and independent of formulas in his own work’.²

The MSE is, in my experience, an example of an environment that could not exist without design. It is the physical interface of the props and equipment that creates sensory experiences for the individual. Without it, it would be like sitting in an empty box, devoid of any stimulation, and this would be then called a ‘Seclusion Room’, used within psychiatric units used to control and calm individuals from acting out violently.

A comparison of both my written accounts of the 2008 and 2009 Snoezelen® Symposiums (See Appendix 2A-B), illustrates the recent shift in attitude towards design. The designer is beginning to be recognised as having the skills to develop the tools that aid the care workers to create new experiences and ways of interacting and communicating with the user with in the MSE.

As perfumers use smell, chefs’ taste, musicians’ sound, textile designers use their sense of touch as well as vision to guide them through their practice. This combined with intuition, understanding of materials and human behaviour are important ingredients that can help and reinstate the authority of touch within the physical interface of the MSE to re-establish it as a multi-sensory rather than a single-sensory experience.

² Munari, B. (1966) *Design as Art*, London: Penguin Books, 27

Beyond the MSE

With the rapid growth of interest and research into the senses, there is a growing realisation that we are all subject to sensory deprivation and overload. We only have to walk along a street or visit a shopping centre to be visually overloaded and bombarded by posters, adverts and bright lights, all trying to tempt us into parting with our money. The noise of traffic, mobile phones and the bleeping of the oyster card constantly interrupt our sense of sound. As we become more subjected and intoxicated by noise, technology invites new laws and manners such as NO mobile phone carriages on trains and in bars to satisfy our need for silence. Television, computer games and internet shopping has become an important leisure time activity, offering us visual stimulation and limiting our movement and interactions to sitting and key-pressing with our sense of touch, predominantly exposed to the hard, plastic textures, such as, the interface of the keyboard, joy stick and mouse. As described by the anthropologist Ashley Montagu;

'We in the western world are beginning to discover our neglected senses. This growing awareness represents something of an overdue insurgency against the painful deprivation of sensory experience we have suffered in our technological world'¹.

It was not until the 1950s and 60s during the advent of deinstitutionalisation that a series of studies started to question the effects of institutionalised care. The studies were concerned with sensory deprivation, focusing primarily on the elderly with dementia. These were instrumental in educating us about the effect of sensory deprivation, and the detrimental effects a sensory deprived environment can have on our physical and mental wellbeing. (See Appendix 1A)

¹ Pallasmaa, J. (2005) *The Eyes of the Skin*, Great Britain: John Wiley & Sons, 37

Today there is a growing realisation within the field of architecture, interior, spatial and environmental design of the influence our physical environments have on our sense of wellbeing. In October 1966 the Journal of social issues was titled '*Psychological Aspects of Urbanology*' each article in this volume was concerned with the sensory qualities of our physical environment and the direct impact this could have on human behaviour.

In the article, 'Psychological Aspects of Urbanology', Alan Parr supports the idea that modernisation is effecting the sensory experience of our environments. In which Parr expressed, 'probably the most neglected aspect of urbanology is that which has to do with the direct impact upon human psychology of the sensory perception of the man-made designs that are rapidly replacing natural forms of our surroundings, to the point of almost total exclusion from the metropolitan milieu ².

In response to this a succession of methods of measuring and assessing the sensorial qualities of our environments were devised. For example Joy Malnar and Frank Vodvarka's developed the sensory slider as a method of comparing the sensorial qualities of buildings, James J Gibson, The perceptual systems in 1966, A. Richard Williams the Sensory Realm (1980) and more recently Marina Panos, sensory experience chart in 2001. These methods interlink with the sensory profiling model created by Dr Winnie Dunn (1997), Dunns model indicates an individuals responsively to sensory input of which it is the built environment that would influence this input.

ICI Report on: The Secret of our Senses

Since the late 90s there has been a succession of publications that focus on the rehabilitation of the senses within the built environment, most notably the publication of *Sensory Design (2004)* by Joy Malnar and Frank Vodvarka and *The Eyes of the Skin' (2005)* by influential Finnish Architect Juhani Pallasmaa.

² Parr. A.E. (1966) 'Psychological Aspects of Urbanology Man's response to the physical environment', Journal of social issues, xxii (4) October, 39-45 (39)

Most notably, in 2002, came the first groundbreaking study, 'The ICI Report on the secret of our senses', by Dr. Charles Spence of Oxford University. It is an investigation that developed in response to the growing concern for technology and modernisation and how it is subjecting us to an overload of visual and auditory stimulation and deprivation of touch. Dr Spence expressed that;

'Some thing is amiss from our modern life. Society is changing, moving away from an outdoor, physically challenging lifestyle that traditionally embraced all the senses – to an indoor, sedentary lifestyle which, although making life easier, doesn't always take into account our need for a balanced sensory diet and the essential part that it has to play in our wellbeing'³.

The report brings together the best of current thinking in education providing us with an insight into why we should stimulate our senses. Spence believes that 'a more balanced 'sensory diet' is a vital antidote to beat the stresses and strains of modern living' and coined this antidote 'sensism', 'from creating stimulating environments that increase our productivity and creativity, to techniques that heal our bodies and minds when the stresses and strains of daily life become overpowering. Sensism has the power to change the roots of our society' ⁴.

Spence draws upon sick building syndrome as a prime example of how the sensory qualities of our working environment can affect our wellbeing and as a consequence more people are taking days off work, which is having an impact on the economy. The growing incidence of sick building syndrome (SBS) is estimated to cost the British economy over £600,000,00 each year, translating up to 2% of a company's payroll attributable to our receiving the wrong sorts of sensory stimulation ⁵.

In 2001 I worked in a handloom factory in India and visited neighbouring power loom factories. This experience highlighted to me how the invention of

³ Spence, C. (2002). The ICI report on the secret of the senses. London: The Communication Group, 5

⁴ Spence, C. (2002). The ICI report on the secret of the senses. London: The Communication Group, 5

⁵ Spence, C. (2002). The ICI report on the secret of the senses. London: The Communication Group, 5

the power loom and machinery transforms the atmosphere and sensory experience of the working environment into one that is loud, alienating, clinical, lonely and unfulfilling. (Figs.167-170)

Spence supports his theories with many case studies and examples of how multi-sensory design can and has the power to positively affect our health, choice and wellbeing. Sensory marketers are realising the benefits of a multisensory design approach, for example Rolls Royce ran a scented add in Architectural Digest several years ago that allowed readers to smell the leathery rolls of interior ⁶.

With this imbalance of sensory stimulation and information overload, it is no wonder that there has been a surge of interest in holiday and leisure activities, offering relaxing and holistic environments such as Vaals Spa designed by Peter Zumthor (Figs.171-173) together with yoga 'in the dark' and meditation retreats which help re-balance our sensory diets but also put us back in touch with our bodies. Or stimulating adrenalin high holidays such as skydiving and bungee jumping are also growing in popularity as a ploy to activate our senses. As indicated in the ICI Report, one in five Britons in the UK alone are now opting for holistic therapies, and are spending over £1.6 billion every year on such treatments, 90% of which is paid for privately⁷.

The MSE and Interior Design

The concept behind the MSE and Spa are very similar, both facilitate sensory stimulation the differences being that the MSE is for individuals who experience extreme sensory thresholds and the Spa is predominantly for individuals whose sensory thresholds are not so extreme. The standard MSE equipment is also found in mainstream interior design. Fibre optic panels can be found within the interior of health spas and bubble tubes and water effect walls can be found in the foyers of international business headquarters, upscale restaurants and bars. (Figs.174-175)

⁶ Spence, C. (2002). The ICI report on the secret of the senses. London: The Communication Group, 91

⁷Spence, C. (2002). The ICI report on the secret of the senses. London: The Communication Group, 5

As the MSE is gaining acceptance within 'mainstream' society and expanding into mainstream schools, maternity units and leisure centres, large companies too are adopting a 'Snoezelen®' approach to the interior of the working environments, for the wellbeing of their staff. As illustrated previously the innovative office spaces at Google.com are not so dissimilar to the concept of the MSE and the 'themed' rooms found in The Golden Horn, Denmark.

It is quite obvious that we should not treat our environments as just backdrops to our everyday activities but as an important medium that, with a 'Snoezelen®' and 'Sensism' design approach to interior and environmental design we can begin to orchestrate our environments meet the sensory needs and enrich the 'sensory diet' for the population as a whole, interior design that appeals to all of our primary senses.

The Sensory Revolution in Art and Design

The post war era of the 1960s was a time of rapid and dynamic change with radical developments of new technologies, materials, media and communication systems. In the 1960's artists, designers and experimental architects were motivated not by capitalism, but took onboard a more human-centred design approach that encompassed social and environmental considerations. They freed themselves from restrictive rules, rejecting the modernist design of functional objects. They began to let their imagination roam free, exploring and immersing themselves within a pool of new industrial materials such as thermoplastics, production techniques and technologies. This resulted in the emergence of 'multi-media' artists and a wave of innovative installation, performance and spatial design experimentations that explored the relationship between the body, space, technology and materiality.

Consequently 3-dimensionality, expression, play, interaction, humour, perception, human psychology and the body became important components of the multi-media artist/designer. Their interactive works presented less visual and more sensorial design approach which began to question the boundaries between Art and Design, as illustrated in the writings of Bruno Munari in his book *'Design as Art'*, 1966.

The interest in interactive and immersive art works was illustrated in The Documenta IV Exhibition 1968, which involved artists such as Claes Oldenburg, Roy Lichtenstein, whose works involved and required the interaction of the visitor. In the same year Cybernetic Serendipity at the Royal Academy, showcased artists and designers whose computer-aided works were reactive to humans or the environment. New ways of thinking emerged namely the Cybernetician Gordon Pask, Architect Cedric Price and Cultural Theorist Paul Virilio in response to new virtual and digital technologies.

In conjunction with this, the new tool of technology tempted not all artists and designers, the influential artists Yasoi Kusama, Helio Oiticica and Verner

Panton created expressive interactive works through the inventive use of materials. Panton's sensual and atmospheric environments experimented with play, imagination, emotions and human perception. His material orientated design approach redefined the concept of the living space and created dialogues between the human body and the surrounding environment. Practising 'total-design' he moulded the walls, ceilings and floor together, fusing sounds, odours and textures that created organic 'interior landscapes' creating a unique perception of space that could be enjoyed from all bodily angles, positions, perspectives and sensations.

As quoted by Verner Panton; "I can't bear to enter a room and see the sofa and coffee table and two armchairs, immediately knowing that we are going to be stuck there for an entire evening. I made furniture that could be raised and lowered in space so that one could have different view of the surroundings and a new angle on life" ¹.

Sensory Revolution

The 1960s saw a stage of development in which the multi-media artist/designer maintained a dynamic between technology and the newly developed materials. Today, however, digital technology has become a material and within the field of art and design the emergence of virtual, digital and cyber space technologies is tipping the balance between matter and system, with physical materiality becoming occluded by 'virtualities'. Experience is now enveloped, wrapped and shaped around this transparent material of information and communication systems, disembodied from matter and sensory interaction.

Living in what Frederic Jameson (Jameson, 1979) nominates as post-modern society and having been the 'guinea pigs' for new technologies. We have become dependent and subservient to its physical and psychic effects. If technology was originally intended to be the tool for humanity it can seem to have enslaved us too ('Computer Says No'). Whilst stimulating our minds, our

¹ Vitra Design Museum (2000) Verner Panton: Collected Works, Vitra Design museum, 45

bodies are left dormant and with this there is a growing collective concern within all fields of education, health, art and design, which is instigating a sensory revolution and following eminent precursors such as Sir Thomas More (1478-1535) and the radical architects of Superstudio (1966) the concept of Utopia is being explored once more.

The realisation or re-discovery of multi-sensory design considerations is now filtering into the field of art, design and architecture. Art and Design schools are responding to the rapid speed of technology and its repercussions on society, by diversifying and changing the direction of their design courses. For example the MIT Touch Lab founded in 1990 together with Delft University, Holland, offers a diverse range of courses involving interaction, haptic and multi-sensory design, opening up collaborations and strong links between science, technology art and design, simultaneously materials libraries also are gaining recognition.

In contrast to material orientated exhibition Sensorium by Hugo Kukulhaus as described in chapter five In 2006 MIT curated an exhibition also titled 'Sensorium' which ironically looked at the relationship between our bodies and technology. More recently similar to Cybernetic Serendipity, in December 2009 the exhibition Decode at the Victoria and Albert Museum, London, showcased digital media artists and interactive designers who are embracing new virtual and digital technologies, looking for new ways in which new technologies can involve the body and the primary senses particularly that of touch which included works by Studio Roosegaarde. (Figs. 176-177)

Tate Modern has also run a succession of exhibitions that involve play, interaction, participation that challenges our perceptions. Namely Miroslaw Balka's black hole (2010), Carsten Holler (2007) Slides, Robert Morris (2009) Bodyspacemotionthings, which is a recreation of Morris's interactive exhibition at the Tate in 1971. (Figs.178-182) Designers too are experimenting with materials and beginning to transform the sensory qualities and the experience of our environments similar to that of designs by Verner Panton. (Figs. 183-190)

This sensorial revolution continues to grow. In 2004 'Sensorium' was recreated in Switzerland, in homage to Kukulhaus as an attempt to give adults and children the opportunity to get back in touch with their senses. In the same year the Sensoria Festival of Design Education took place in Melbourne, which was hosted by The RMIT Interior Design Program at RMIT. Running on similar lines to Sensorium, with the aim to highlight and promote the role of the senses for the future of interior design of the 21 century, Sensoria embraced a hybrid of practitioners from a variety of art and design disciplines. This focused on spatial design relating ideas, materials and media in ways to engage the senses, producing a range of sensorial experiences to the visitor.

In the book '*Sensuous Intellect*', Robyn Ho explains that, 'to design for the sensuous intellect is to construct situations where such phenomena can occur. This emphasis on the response of the body suggests an embodiment of the viewer in relationship to the work being presented, an empowerment of the intuitive body over the rational brain of thought' ².

A year on from Sensorium in 2005 the "Touch me" exhibition presented at the Victoria and Albert Museum, London showcased contemporary designers whose work was based on 'the idea that we live in a touch-starved society and that the quality of touch interaction with products is nothing to what it might be.' ³ The exhibition was a great success in presenting innovative work and a concept looking beyond the visual sense, interestingly the installation 'Tune me', developed by the Interaction Design Institute in Ivrea, was influenced by the MSE. This represented an immersive radio set in an environment, which triggers different visual experiences and vibrations that interact with the visitor every time you tune into a different station. (Figs.191-192)

More recently in 2008, product designer, Kenya Hara curated the exhibition '*HAPTIC*', which took place in RIBA and I 2009 the exhibition *Senseware*

² Ho, R. (2006) *Designing for the Sensuous Intellect*, in: *The Sensuous Intellect*, Australia, RMIT University Press 169-172 p169

³ Classen C and Howes, D, (2006) *The Museum as Sensescape: Western Sensibilities and Indigenous Artifacts*, in: Edwards, E, Gosden, C, Philips, R (eds), *Sensible Objects*, Oxford: Berg, 199-122

which showcased at La Triennale di Milano, both of which invited a hybrid of designers and artists to experiment with materials, objects and forms that focus on interaction and the sense of touch. (Figs. 193-196) Hara states that,

‘While affirming scientific progress, I would like to propose that we pursue manufacturing that originates in the pursuit of the senses, or that we use not technology but human senses to evoke the animating force of manufacturing’ an alternative design practise designated as the ‘sense driven world’.⁴

⁴ Hara, K. (2004) Haptic: Awakening the Senses, in: Hara, K. (Eds) Haptic Japan, Takeo Co Ltd 6-7

Occupational Textiles: Inspiration

The Philosophical Toy

The Philosophical Toy originated in the 18th and 19th century. It is where scientific experimentation and abstract thought concerning the physics of motion, energy and force meet with a physical form. The philosophical toy is engineered through the inventive use of materials that create unique kinetic and optical behaviours, which amuse and fascinate both children and adults, therefore representing a truly universal toy. Friedrich Fröbels 'Occupational Gifts' can also be referred to as philosophical toys as they are physical representations of his philosophy surrounding active learning and play. This is where the child's physical engagement with material reinforces cognitive developments and learning experiences.

Philosophical Toys fulfilled the dual role of instruments for scientific experiment and devices for extending awareness of the senses (see Turner 1998).¹

My textile practice is influenced by the didactic and philosophical toys of the past. They are simplistic in design in which their interesting qualities and behaviours are created through the inventive engineering of hard materials such as wood, metal, foam and glass. In contrast to the plastic, mains-power and battery driven toys of today, the toys of the past were powered by manipulation and imagination (Fig. 197), whose haptic experience and kinetic behaviours have withstood the test of time, and continue to amuse and entertain children and adults today.

As French philosopher Roland Barthes (1915-1980) expressed, "plastic 'destroys all the pleasure, the sweetness, the humanity of touch...' by contrast, 'When the child handles [wood] and knocks it, it neither vibrates nor grates...It is a

¹ Wade, N. (2004) Toying with science, *Perception*, 33 1025-1032 [online] available from: www.perceptionweb.com/perception/perc0904/editorial.pdf [Accessed 12 February 2009]

familiar and poetic substance, which does not sever the child from close contact with the tree, the table, the floor...would make essential objects, objects for all times”².

My textile practice is inspired by the success and timeless appeal of classic toys that have lasted over generations, which continue to evoke feelings of nostalgia to parents and continue to add value and appeal to children today. The following collection of occupational textiles capitalises on the somatic nature of textiles that naturally lends itself towards the stimulation of the primary senses, particularly that of touch and combines this with the unusual techniques and existing materials found in the construction of classic toys such as the slinky, marbles and the Jacobs Ladder. This unique combination will unite different processes and materials to animate, bring to life and transform these toys in terms of scale, shape, sound, weight temperature, and colour to accentuate and heighten the sensorial, kinetic, haptic and bodily experience it perpetuates for each individual.

Occupational Textiles

“Steel tubes, foam springs and covers have been so developed technically that we can create forms which were unthinkable just a few years ago. Designers should now use these materials to create chairs which exhaust all the technical possibilities of the present in which I live”³. (Verner Panton) ...in stead of chairs I will create toys.

The collection of ‘occupational textiles’ described below are a series of six textile props, each design is guided by my observations in the MSE and influenced by the field of occupational therapy that promote the occupation of play and action. The collection is in homage to the didactic materials of Friedrich Froebel and Maria Montessori, with their emphasis on form, shape, weight, colour, temperature, texture and size.

The props are tools for health care practitioners and parents to use as catalysts for movement touch and play activities and cues for narrative and interaction. Their unique properties create a form of sensory communication

² Bathes, R. (1972) ‘Toys’ in *Mythologies*, selected and translated by Annette Lavers, New York: Noonday press, 53-55 (53)

³ Anne Lee Morgan (ed.), *Contemporary Designers*, London: Macmillan 1984, 470

that are age and stage appropriate for both children and adults who are at the sensorimotor stage of cognitive development. Independent of power sockets, wires and switches it is the touch and fine / gross motor movement that will activate my work, promoting independence and a sense of control for the participant. The unique collage of materials creates an in determinant form in which the function of play determines the form. As expressed by the French biologist Jean-Baptiste Lamarck 'The form follows the function' ⁴.

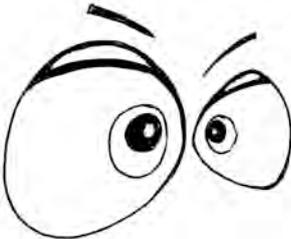
Steering away from the mimetic role-play posed in many toys of today, the collection of occupational toys are abstract in shape, not to be recognised as a thing such as a doll, but for the sensory experience of 'the doll'. As advocated by the child Psychoanalyst Melanie Klein (1982-1960) in which she expressed, 'toys should have no uniforms or special dress or any indication of occupation or role which would suggest a particular kind of play'.⁵

The abstract shapes and unusual kinetic and tactile qualities create a natural curiosity that intrinsically motivates the individual, exercises the imagination, and hold unusual kinetic and tactile qualities that will entice touch, movement and the occupation of play.

⁴ Munari, B. (1966) *Design as Art*, London: Penguin Books 33

⁵ Segal, H (1979) Klein, London: Fontana Modern Masters, 41

Chapter 10
Occupational Textiles

			
Touch	Sight	Sound	Smell

Tactile Journey



Tactile Journey (Fig.211-213)

Tactile journey is inspired by Ben (See Appendix 3B), Ben would lay the side of his head onto a chair and as I pulled it along over different surface gradients Ben enjoyed the acoustic and vibration feedback from quiet grass's to the loud concrete and bumpy pebbles. We would repeat this sensory journey every day for 2 months, there was not a toy or prop available that would give him the same experience.

During the sensory journey Ben would get very tired and when it rained he would get very upset that we would have to stop the journey. Tactile journey brings together all of the sensations Ben experienced in one. So that he can independently experience the journey indoors and outdoors no matter what the weather and from a more comfortable posture.

A vibrating foam tube is enveloped with a collage of black materials each holding different textural properties (the surface gradients). All of the textured materials are of the same colour this prevents any visual distraction and focuses on their haptic experience. From the quiet velvet to the scratchy sequins each texture creates its own unique sound. The haptic-audio experience is heightened and intensified further with vibration.

Marbelous



Marbelous (Figs.208-210)

Marbelous celebrates and accentuates the weight, sound, cold temperature, visual and haptic experience of marbles, marbelous is a series of weighted fabrics which are a non-invasive method of providing proprioceptive feedback and stability for seated users which simultaneously invites touch, deep-pressure and an exciting multi-sensory experience.

Rola-Textiles



Rola-Textiles (Fig.207)

Traditionally schools, residential homes and day care centres would dedicate a whole room towards the installation of a multi-sensory environment. However due to the shortage of space, money, problems with transportation and inclusion, there is now a demand for a transportable MSE, that could be set up ad-hoc in a family home.

Light weight and simple in design the humble cardboard box continues to inspire children's imaginations who transform it into an infinite variety of dens and mini environments and led to the development of 'ready-made', mobile play tents, forts, Wendy houses, which has been an inspiration for this project.

Rola-textiles is a transportable and deployable structure that creates a private and special space whose confines will bring the individual physically and visually closer to their surroundings. This will limit the distractions and stimulations of the external world, allowing them to concentrate on the sensory activity at hand.

Rola-Textiles is a unique combination of Lycra and Bi-stable Reel Composite (BRC) produced by Rolatube Technology Ltd. It is a lightweight, deployable structure with a unique behaviour which gives the individual the control and freedom to imagine and construct a 3-dimensional form through method of play and motion of folding, bending, flipping and rolling to create their own personalised mini-environment.

Snap-Wrap



Snap-Wrap (Figs. 203-206)

'Snap-wrap' is a series of playful, reactive materials that move and come alive through the touch and motion of the participant. Snap-wrap reacts to the slightest pressure and will instantly snap and wrap around the part of the body that is in contact with the material, creating a tactile, multi-sensory experience.

From my observations in the MSE it was often the sensory prop that provided instant sensory feedback such as vibration, sound and movement in response to the touch of the participant that appeared to successfully captivate their attention and imagination. For individuals with limited mobility the successful props were those that required minimal action or movement from the participant to trigger its behaviour.

Being wrapped is also a technique used for deep pressure during Sensory Integration Therapy, occupational therapists and parents have reported the positive effect of 'being wrapped in material' for people with learning disabilities. For example Oliver et al. (ibid) report cases of people with learning disabilities who have rolled themselves in bedclothes (Francezon et al. 1981), wrapped themselves in sheets (Paterson & Peterson 1968) and wrapping hands inside clothing (Hardy et al. 1984) ¹.

In light of this 'Snap-wrap' textiles offers something new, that creates a form of indirect touch for individuals who are unable to roll and wrap themselves in material, instead let the material do the work and roll and wrap around them. Snap-wrap is a unique material that independently moves, grasps and wraps around objects. When in contact with the body it creates a sensation of being wrapped, held and touched, otherwise only feasible through direct human contact. It is therefore particularly beneficial for individuals who are touch defensive.

The sensation of being wrapped and held will give the service-users a sense of bodily awareness, encourage independent play and interaction, experience cause and effect, the development of motor skills and reduce stereotypical behaviour with a subtle pressure that reduces feelings of anxiety.

¹ Blairs, s. Slater, S. (2007) 'The clinical application of deep touch pressure with a man with autism presenting with severe anxiety and challenging behaviour', *The British Journal of Learning Disabilities*, 35(4), 214-220 (215)

Within the multi-sensory market the benefits of being wrapped in material and the natural infinity it lends towards privileging the stimulation of the senses, is slowly creeping in to the glossy catalogues of sensory prop manufacturers. This is in form of weighted blankets, body sox, space blankets and crunchy tactile blankets.

Tip-Tap-Touch



Tip-Tap-Touch (Fig 214-217)

‘Weaving touch, play and movement into the fabric of our environments’

Tip-Tap-Touch is a body of work designed and developed for the world’s largest MSE facility; The Golden Horn in the village of Solund, Denmark. Tip-Tap-Touch recognises that touch is the only sense capable of both sensing and manipulating the environment. It therefore aims to regain the authority of textures and materials, capitalizing on the natural infinity they lend towards privileging the stimulation of the senses, particularly that of touch, and striking a healthy balance between technology and materiality.

Tip-Tap-Touch steers away from technology and celebrates the unique engineering of materials posed within the traditional toy, the Jacobs ladder. Tip-Tap-Touch has re-invented the Jacobs ladder from a single toy to an interactive wall/partition to aesthetically enhance and encourage touch, play and movement in any given environment. Extending the interaction of the Jacobs ladder from hand manipulation to a whole body experience that can be enjoyed independently or within a group situation. Its unique playful and interactive nature physically engages an individual’s mind and body. This promotes fine motor skills, communication, hand-eye coordination, cause and effect, and is inclusive to everyone despite age, gender or mental and physical capabilities.

Tip-Tap-Touch is inspired by the unique mechanism found in the traditional folk toy ‘Jacobs Ladder’ whose earliest known reference was in 1889. It has been theorized that its origin is from a Chinese falling-block toy, called "Chinese blocks", and it is still enjoyed with fascination today by both adults and children.

Textiles is key to the development of the Jacobs Ladder. The mechanism is engineered through the process of weaving, the interlace of ribbons hold the blocks of wood together in strips/ladders, allowing each block to act as if hinged to the next one at either of its two ends. Powered through touch the blocks create a visual illusion where they appear to cascade down the ribbon, which is actually the result of one block flipping after the other.

Expanding the Jacobs ladder in scale from a singular ladder of 3” to multitude of ladders of up to 3 metres wide, the tip-tap-touch panel is created. The ladders are grouped and attached to modular mechanical pulley system, similar to

roman blinds. This was designed in collaboration with Industrial Design Engineers at The Royal College of Art. Tip-Tap-Touch then moves and come alive through the touch, play and motion of the participant. Independent of power sockets, wires and switches, Tip-Tap-Touch is activated by the pull of a handle, which activates the top row of wooden blocks to then tip 180 degrees tapping the blocks below, creating a domino effect as they continue to tip-tap vertically down in unison. If a wooden block stops moving the participant simply has to tap it.

Grouping the ladders creates a blank canvas for unlimited amounts of patterns and design ideas and as the wooden blocks flip/cascade another blank canvas is revealed with yet more design potential, which can be enjoyed from both sides. The Tip-Tap-Touch is focused on black and white, optical illusion, for example when ladders cascade and flip the panel change from horizontal to vertical stripes.

Each panel stimulates the primary senses of sight, sound, smell, touch, movement and are unique in terms of design, colour, shape and size with the potential to reveal six different surface aesthetics and unlimited variations on design in terms of form, scale, touch, sound, colour and pattern.

Springy-Thingy





Springy-Thingy (Fig. 198-200)

Many individuals with autism can become hyper-sensitive or hypo-sensitive to their internal and external environment and may over or under react to visual, tactile, and aural input, to the point where they are unable to participate in typical life. When this is the case, therapists will make a diagnosis of Sensory Processing Disorder, and will recommend Sensory Integration Therapy (See Appendix 1B).

During Sensory Integration Therapy, the autistic child interacts one-on-one with the occupational therapist and performs an activity that combines sensory input with motion. This involves sensory activities that are intended to help the individual regulate his or her sensory response.

Currently occupational therapists employ the therapeutic use of weight to help calm and relax, through the intervention of weighted vests, blankets, belts, neck wraps and lap pads during Sensory Integration Therapy, for people with autism, cerebral palsy, learning disabilities, intellectual disability, ADHD and communication difficulties (Figs.201). The company Southpaw enterprises® INC based in Ohio, was founded in 1979 and specialises in the development and manufacture of products and equipment for Sensory Integration Therapy.

Ayres (1979) and King (1989) reported that wrapping a child with autism in a gym mat produces a calming effect. Persons with autism also have been known to provide themselves with deep pressure in an attempt to calm themselves (Grandin, 1992; Grandin & Scariano, 1986) and often prefer to provide this stimulation themselves, frequently avoiding stimulation controlled by others (Delacato, 1974).¹

Inspired by the popular philosophical toy, the 'Slinky' that was invented by the naval engineer Richard James in the early 1940s and whose 60th anniversary in 2005 marks its ongoing success. Springy-Thingy celebrates and accentuates the unique behaviour of the slinky by threading up to thirteen slinkys into a bespoke knitted tubular structure. The soft, warm skin of textiles envelops the hard, cold metal coil, which automatically encourages touch and extends the interaction of the slinky from the hand to a whole bodily experience. The playful nature of the slinky was also illustrated in the book *Toys and Playthings: in development and remediation* (1979) by John and Elizabeth Newson. (Fig.202)

Springy-Thingy is a new material that takes on the concept of the weighted blanket/vest and pushes it one step further. Springy-Thingy provides the dual purpose of deep pressure and a curious tactile experience that both relaxes and activates individual's undergoing Sensory Integration Therapy. It offers the benefits of relaxation for individuals who become hypersensitive to their environment and simultaneously activates and encourages the development of fine motor skills for individuals who are often hyposensitive to their environment.

¹ Edelson, S. Edelson, M. Kerr, D. Grandin, T. (1999) Behavioural and physiological Effects of Deep Pressure on Children with Autism: A Pilot Study Evaluating the Efficacy of Grandin's Hug Machine, *The American Journal of Occupational Therapy*, March/April, 53 (2) 145-152 (145)

The unique combination of lycra and springs within a horizontal and vertical knitted tubular structure, adds weight and an unusual elastic, flexible quality that allows the fabric to stretch and reform it self. The movement of Springy-Thingy instinctively creates a curious, engaging material that encourages independent play and touch. The black and white rhythmic patterns encourage interaction, which are not solely restricted to just one part of the body, its' playful quality encourages the individual to touch, stretch, reach, manipulate, envelope and wrap Springy-Thingy around the arms, fingers, legs, head and feet, enabling deep pressure to be applied to any given bodily position. The participant can create many different forms and shapes and when they get tired Springy-Thingy can be pushed down into a comfortable pouf. Moving beyond the static machine nature of Temple Grandin's Hug Machine, the transportable, accessible qualities of Springy-Thingy enables deep pressure to be accessed within any given environment.

Conclusion

This practice-led research began with a number of experiences working, playing and being with people whose care, wellbeing, education and culture presented professionals, designers and humanity in general with both challenges and possibilities for learning.

The enigma of understanding the extent to which we all share, as sentient beings, some experience of the sensory world, and the extent to which we are divided by our different neurological, cultural and social conditions, led me to explore this question through research.

I used scientific literature from occupational therapy, educationalists, neurology and para-medical practices to illuminate my experience as a designer, in order to reach a more complete understanding of the relationship between sensory experience and learning. Although this research is developed in the framework of the care and education of sensory and neurological disabilities, or Special Educational Needs, it has become evident that the research within this framework offers much that will illuminate design in a wider context.

It has become especially evident that there is, for the textile designer, a particular significance in the way in which work with sensory impairment and neurological disability demonstrates the fundamental experience of touch and tactile knowledge. Its relation to more sophisticated hand-eye coordination, and other multi-sensory coordination's create the rich connections between different sensory modalities that we call representation, symbolism or thinking.

Working with people in the existing multi-sensory environments (both professionals and 'service users') I began to intuit that the experience of the textile designer could be useful so that this form of design practice can illuminate the sensory and symbolic function of the hand. It can also bring the tactile, haptic knowledge archive that is the designer's intuition, to bear on the design predicament.

The term 'predicament' denotes an experience that exists 'before speech' and this is a valuable insight into the fact that design knowledge, or intuition, refers to experiences that often exceed the limitations of what can be verbalised or symbolised in writing. The universe of the sensory connections that precede verbalisation is of particular importance to those whose sensory or neurological conditions do not allow them to inhabit the universe of language and verbalisation easily thus making experiential design imperative.

Textile designers' specialist knowledge of a range of tactile experiences and materials enable senses of colour, texture, weight, mass, movement, temperature, sound and smell. In a world enveloped by technology has never been so poignant.

Sensory experience will also exist in the form of memory and embodied representations, possibly linked to emotions, moods, feelings fantasies or thoughts. Often someone's sensory experience is connected, strongly, definitely or ephemerally to a meaning, although this psychological research is not the focus of this project.

The textile designer's repertoire of tactile knowledge and intuition is what led me to propose the project 'Tip-Tap-Touch', with its features of colour, texture, sound, movement and materiality which are integrated into the matrix of a woven structure. The wooden slabs held in the weave of the ribbon vertical warp structure are the weft that gives a unique and individual characteristic to the 'material'. The textile metaphor here brings the suppleness and elasticity of experience that allows us to interact in a creative and individual way. It is within the frame of textile design that my experiments with materials led me to make an interaction that has the 'living' properties of a responsive environment.

Working beyond the boundaries of a culture that is dominated by words, rationality and where sight is often the sensory modality of instructive dominance, I have developed a body of responsive 'Occupational' textile works with senses that are more usually relegated to secondary or even tertiary importance. In doing so I have been guided by the people I work with

and have been supported by the cross-pollination of literature on sensory research.

I conclude with the thought that design practice is a form of discovering new knowledge, and is therefore research in itself, to be supported by writing and verbal explication. Secondly, I conclude that the textile designer's experience with materials has a leading role in discovering new knowledge of experience. Thirdly, I conclude that this is of significance to sentient being other than those of us with Special Educational Needs or with Learning Disabilities.

Fourthly, and finally, I conclude that research ends by generating more questions and proposed ideas for further investigation which include...

- The development of an occupational design course to create an exchange of knowledge between human behaviour and design and sharing and transference of methodologies, for example Dr Winnie Dunn's Sensory profiling model.
- The development of sensory design course for the design of experience and universal communication. Design is a form of communication and as Dr Winnie Dunn explains, 'Sensation is the common language by which we share the experience of being human; it provides a common ground for understanding'¹.
- With an increasingly and predominantly elderly population it is important to address the sensorial needs for individuals with Dementia and the needs of society as we all gradually experience desensitisation of our surrounding environments in our older years.

The points mentioned above will be investigated in a proposal submitted for a Research Associate position at The Helen Hamlyn Centre, London, 2010. (See Appendix 11)

¹ Dunn, W (2001) 'The sensations of everyday life: empirical, theoretical, and pragmatic considerations', *The American Journal of Occupational Therapy*, Nov/Dec, 55(5) 608-620 (608)

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Appendix 1A

Sensory Deprivation and Environmental Wellbeing

The shocking history of the treatment and maltreatment of mental illness, impairment and disability in European cultures is well documented: *'The Architecture of Madness, Insane Asylums in the United States'* by Carla Yanni, "Lunatics and Idiots", *Medical History* (1988) P. Rushton and *Madness and Civilisation* (1989) by Michel Foucault.

These histories show that the primary concern of the institutionalization of the disabled, impaired and mentally ill was to separate them from the mainstream of society, in order to protect the latter rather than to assist or help the former. Foucault understands the institutionalization of the 'insane' as analogous to the imprisonment of the criminal, and notes its punitive, controlling aspects. Until the mid twentieth century it was not uncommon for inmates of psychiatric 'asylums' to receive no treatment other than bed rest, testifying to the main function of such institutions as incarceration rather than 'care'. Sensory and social deprivation exacerbated the illnesses of the incarcerated, and some practices of design, such as the eighteenth century 'panopticon' architecture of prisons and mental hospitals. The 'padded cell' interiors for the solitary confinement of violent inmates are vivid testaments to the functioning of institutions as a defense against the anxiety of the 'normal'.

Since the rise of psychiatric sciences and treatments of the twentieth century, and especially since the development of a welfare state in post WW2 Britain, the paramedical professions of nursing, occupational therapy, speech therapy and more recently art, music, drama and play therapies have begun to have some effect on both the experience of the residents and on public consciousness of the care of those with 'special needs'. The renaming of children as ESN (Educationally Sub Normal) to children with SEN (Special Educational Needs) is a very recent one.

The evolution of occupational therapy has played an important contribution to shaping attitudes towards mental health practice and held revolutionary ideas towards the provision of leisure occupations for individuals with mental health

issues. The succession of physicians such as Phillippe Pinel (1745-1826) and the psychiatrist Dr William Rush Dunton (1868 -1966) and their belief in 'moral therapy' has contributed greatly to the development of occupational therapy. They wove together health and occupation to enhance an individual's quality of life and wellbeing, with emphasis on leisure, work, massage, therapeutic baths and music as a means to activate, entertain and 'occupy' individuals with disabilities.

In 1914 Susan Tracy the first occupational therapist set up her own institution for training nurses 'the experiment station for the study of invalid occupations' the press stated that "Each patient is considered in light of his threefold personality-body, mind, and spirit"¹. This form of training can be associated with the concept of wellbeing described in the 1960s, is discussed in chapter three.

Occupational therapy obtained medical legitimacy in the 1920's, World War One with its overwhelming number of wartime injuries forced the profession to standardise its training methods, which it then became well known with in the public domain. In 1947 the first major textbook, Willard & Spackman's Principles of Occupational Therapy, was published which in 2008 reached its 11th edition.

Despite this, the implementation of environmental wellbeing and the provision of leisure for individuals with physical and mental disabilities has been a slow journey. In Europe at the end of the 19th century the first institutions for the care of the mentally ill were established and as 'mental retardation began to be regarded as a congenital defect, the therapy was: bed nursing"². Though many of the individuals were not physically ill they were still confined to a bed, which led to limited physical activity, boredom and frustration. Ad Verhuel explains that 'the room of the institutions used to be bare. They were furnished as little as possible because they thought that the severely retarded patients in particular would

¹ Mansfield, J. Recreational therapy history by Categories [online], Therapeutic Recreation Directory, available through: <http://www.recreationtherapy.com/history/rthistory4.htm> [Accessed 12 January 2010]

² Verhuel, A. (2007) *Snoezelen Materials Homemade*, Holland: Ad Verhuel, 11

only wreck the furniture, and they would not care what furniture and attributes were in the room anyway' ³.

It was not until the 1950s and 60s during the advent of deinstitutionalisation that a series of studies started to question the effects of institutionalised care. The studies were concerned with sensory deprivation, focusing primarily on the elderly with dementia. These were instrumental in educating us about the effect of sensory deprivation, and the detrimental effects a sensory deprived environment can have on our physical and mental wellbeing.

In response to this the American psychologists, Charles C. Cleland and Charles M. Clark (1966) published '*Sensory Deprivation and Aberrant Behaviour among idiots*' which draws together early studies of the detrimental effects a sensory deprived environment can have on self stimulatory behaviours in which they present a guide for future research based upon "sensory mapping" in conjunction with a sensory cafeteria.⁴

Kulka et al (1960) identifies self-stimulating behaviours and suggests, "rocking, head-banging and other such rhythmic movements, which are seen in infants with prolonged deprivation may be an attempt to gratify their own kinaesthetic needs"⁵.

In 1958 Liederman et al conducted studies whereby participants were placed in sensory-deprived environments. After one hour, the participants experienced agitation, anxiety, hallucinations and a decreased ability to perform well on physiological tests and, within 12-72 hours, developed a psychotic-like state. After the environment was changed to include stimulation the symptoms rapidly cleared. ⁶

³ Verhuel, A. (2007) *Snoezelen Materials Homemade*, Holland: Ad Verhuel, 11

⁴ Cleland, C, Clark, C. (1966) 'Sensory Deprivation and Aberrant Behaviour among Idiots', *American Journal of Mental Deficiency*, Sept, 71 (2), 213-223 (213)

⁵ Cleland, C, Clark, C. (1966) 'Sensory Deprivation and Aberrant Behaviour among Idiots', *American Journal of Mental Deficiency*, Sept, 71 (2), 213-223 (215)

⁶ liederman, PH, Mendelson, J, Wexler, D, Soloman, P. (1958) 'Sensory Deprivation: clinical aspects', *Archives of International Medicine*, 101 (2) 389-398 (389)

Following on from Liederman it was in the 1960s that acknowledgement of the positive effect of multi-sensory stimulation and environment enrichment for⁷ individuals with developmental delays and dementia began to evolve. Supporting this in 1965 Duane Schutz coined the term Sensoristasis which means to create a balance between both interacting and relaxing our senses and two years later in 1968, The Environmental Docility Hypothesis was proposed by Lawton.P, L & Simon.B, which addressed the relationship between the elderly and their environment. They hypothesized that while the active and passive use of the physical environment by man have long been the concern of the architect, designer, planner and ecologist, systematic attempts to link these sciences with behavioural science are relatively recent in origin ⁸.

In the mid 1960's environmental enrichment and the introduction of stimulating activities for adults in institutionalised care began to emerge as a way to improve the individual's quality of life and wellbeing, which have many close associations with Maria Montessori's sensory activities.

Weil, J (1966) recognized the need for activities that could be enjoyed by individuals who are cognitively impaired. Weil designed simple, non-taxing activities such as finger painting, sorting coloured buttons, listening to music, and winding a ball of yarn. He found that patients who were apathetic "came alive" during these activities and patients who were disturbed became quite and serene ⁹.

Bower 1967 and Burnside 1969 also changed their practice to involve multi-sensory activities, which were designed and initiated with out the availability of modern equipment. At that time the sensory activities involved arts and crafts, listening to music, drinking hot tea, smelling flowers, tasting favourite foods all of which incorporated the five senses.

In 1966 Cleland and Clark proposed the idea of a 'sensory cafeteria', which would provide an environment where in the full range of sensory stimulation could be

⁸ Lawton,MP, Simon, B. (1968) 'The ecology of social relationships in housing for the elderly', *The Gerontologist*, 8 (2): 108-115 (108)

⁹ Chitsey,AM,Haight,BK,Jones,MM. (2002) 'Snoezelen: a multisensory environment intervention', *The Journal of Gerontological Nursing*, March 28 (3) 41-49 (42)

elicited on the basis on individual patient preference¹⁰. To measure the effect of this environment was also a concern. Threshold differences and choice of certain sensations are presently detected only through laboured and prolonged observation. To circumvent this, the new environment would be systematically monitored by cameras, recorders and counters to permit diagnosticians the advantage of delayed playback and analysis¹¹.

As discussed in chapter two the concept behind the sensory cafeteria was the major inspiration to the MSE, an environment that offers sensory stimulation for an individual's particular needs. And forty-four years later prolonged observation continues to be the main method of monitoring the users' response and experience.

With the growing elderly population, the body of research conducted in the 1960s concerning the elderly living in institutionalised care, reveals important information and methods that can be applied to society today. Models such as the Environmental Docility Hypothesis are being used as a framework for research that is concerned with the elderly and environmental wellbeing¹², a model that could also be of benefit to interior designers and architects. Given the multi-sensory nature of the leisure activities offered to the elderly in institutions in the 1960s, it is of no surprise that the MSE has become a popular leisure resource for individuals with dementia. The occupational therapist Lesley Collier is actively involved in research that explores the value of multi-sensory environments for people with dementia. Interestingly the sensory activities offered also have a connection with Montessori activities, recently it has been acknowledged that Montessori materials are of benefit for individuals with Alzheimer's disease and research has begun to explore this

¹⁰ Cleland, C, Clark, C. (1966) 'Sensory Deprivation and Aberrant Behaviour among Idiots', *American Journal of Mental Deficiency*, Sept, 71(2) 213-223 (222)

¹¹ Cleland, C, Clark, C. (1966) 'Sensory Deprivation and Aberrant Behaviour among Idiots', *American Journal of Mental Deficiency*, Sept, 71(2) 213-223 (222)

¹² Knipscheer, C.P.M, Broese Van Groenou, M.I, Leene, G.J.F Et al (2000) 'The effects of environmental context and personal resources on depressive symptomatology in older age: a test of the Lawton model, *Ageing and Society*', Cambridge University Press, 20:183-202

theory¹³ (Figs. 219). Christine Mitterlechner presented her collection of gerontological materials at the European Montessori conference held in Poland (2009). The gerontological materials are developed through the combination of Montessori materials with the needs of the elderly, to encourage independence and self-activation.

With current demographics of the western population indicating an expanding number of people living into old and extreme old age the state is supporting research into the environmental needs of those suffering from dementia and Alzheimer's' disease.

¹³ David E. Vance; Robert J. Porter Jr. (2001) 'Montessori Methods Yield Cognitive Gains in Alzheimer's Day Cares, *Activities, Adaptation & Aging*', 1544-4368, 24 (3) 1 – 22

Appendix 1B

Occupational Therapy and Sensory Interventions

Learning about the world begins with our senses. As infants we develop and become aware of our external environment via the transmission of thousands of sensory receptors through the sensations of touch, sight, smell, taste and vision. The majority of us are fortunate enough, and often take it for granted, that we are able to explore the world through our five senses. These allow us to interact, respond and understand the environment around us.

As explained in Chapter four early 20th Century developments in education emphasised play, active learning and the stimulation of the senses, as a means of enhancing an individual's development and wellbeing.

Despite this the provision of leisure, with the realisation that play is of enormous benefit for individuals with physical and mental disabilities, has been a slow journey. It is thanks to a succession of physicians such as Phillippe Pinel (1745-1826) and Dr William Rush Dunton (1868-1966) whose emphasis on work, leisure activities, massage, therapeutic baths and music, as a means to activate, entertain and 'occupy' individuals with disabilities, in order to enhance their quality of life and wellbeing, contributed greatly to the development of occupational therapy.

In 1914 Susan Tracy was the first occupational therapist that set up her own institution for the training of nurses, 'the experiment station for the study of invalid occupations' in which "Each patient is considered in light of his threshold personality-body, mind, and spirit."¹ The Experiment Station had many features associated with the notion of wellbeing that later developed in the 1960s as illustrated in chapter three.

Occupational Therapy obtained medical legitimacy in the 1920's with its main focus on the occupation of work and leisure activities. In World War 1 the

¹ Mansfield, j. Recreational therapy history by Categories [online], Therapeutic Recreation Directory, available from: <http://www.recreationtherapy.com/history/rthistory4.htm> [Accessed 12 January 2010]

overwhelming number of wartime injuries forced the profession to standardise its training methods, which then became well known with in the public domain. It was in 1947 that the first journal (Occupational Therapy and Rehabilitation) and the first major textbook (Willard & Spackman's Principles of Occupational Therapy) were published.

Occupational Therapy is defined as:

“Occupational therapy is the art and science of helping people do the day-to-day activities that are important and meaningful to their health and well-being through engagement in valued occupations. The *occupation* in occupational therapy comes from an older use of the word, meaning how people use or “occupy” their time. As such, occupational therapy refers to all of the activities that occupy people’s time and give meaning to their lives. Occupation includes the day-to-day activities that enable people to sustain themselves, to contribute to the life of their family, and to participate in the broader society. (American Occupational Therapy Association [AOTA], in press)

2

Occupational Therapy and the Senses

Imagine if one or all of our senses were intensified or are not at all present. Imagine how oppressed a person must feel who is unable to control their surrounding environment and rate of stimulation due to their sensory impairment. This is the case for many children and adults with unusual sensory processing patterns who face difficulties processing, exploring, registering, organising and collecting the stimulations in daily life.

Unusual sensory processing patterns or sensory dysfunctions run concurrently with many developmental disabilities such as autism spectrum disorders and downs syndrome and may lead to sensory defensiveness and Sensory Modulation Dysfunction described by Hanfit et al. (2000) as,

² Larson, E, Wood, W, Clark, F. (2003) ‘Occupational Therapy Practice’, in: Willard & Spackmans Occupational Therapy (10th ed) Crepeau, E.B, Cohn, E.S, Schell, B.A B. (Eds.), Philadelphia: Lippincott, Williams & Wilkins. 27-45, (28)

A pattern of DSI [dysfunction of sensory integration] is where a person under or over responds to sensory input from the body or environment. It is a mismatch between the external contextual demands of a person's world (e.g. culture, environment, tasks, and relationships) and a person's internal characteristics.³

The understanding and important meaning of sensory experience has inevitably played a central role across the entire evolution of occupational therapy. Many interventions have been developed to help address individual's sensory needs and compensate for their sensory dysfunction to make their daily life much easier.

One of the first major developments that is continuously being practiced with in the field of occupational therapy is Sensory Integrative Therapy, developed by Dr A. Jean Ayres (1972, 1979) defined as:

“The neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment
4.

The intervention is developed to decrease tactile defensiveness and addresses poor discrimination of body position, body movement and the orientation of the body in space (vestibular and proprioceptive). Sensory Integration therapy involves activities that require props and equipment that encourage deep pressure, linear, horizontal and upside down movements. For example, weighted blankets and vest, bolster swings, trampolines, scooter boards, large pillows, beanbags and ball pools (Fig.219-224).

Since the mid-to-late 1980s Sensory Integration Therapy has been widely taught and practised in occupational therapy and triggered further research amongst the field of neuro –psychology. In 2002 the 2nd edition of Sensory Integration: Theory and Practice was published and MSE manufacturers are now developing

³ Hanfit, B.E., Miller.L.J., & Lane ,S.J. (September 2000). Towards a concensus in terminology in sensory integration theory and practice: Part 3: Sensory Integration patterns of function and dysfunction: Oberservable behaviours: Dysfunction in sensory integration. *Sensory Integration Special Interest Section Quarterly*, 23, 1-4 (p1)

⁴ Ayres, A.J. (1972) 'Sensory integration and learning disorders. Los Angeles: Western Psychological Services, 11

equipment specifically for Sensory Integration Therapy, advertised in their catalogues.

The MSE evolved soon after the development of Sensory Integration Therapy, which then influenced The Wilbarger Approach (Wilbarger & Wilbarger, 1991), which was developed to specifically address sensory defensiveness, which is described as, a constellation of symptoms that involve avoidance reactions to sensation from any sensory modality (Wilbarger & Wilbarger, 1991).⁵

The Wilbarger Approach involves the application of deep pressure through a special brushing technique and an individualised treatment plan for families. Wilbarger (1984) coined the term “sensory diet” which is a treatment programme for families to help adapt activities and the environment to meet an individual’s sensory needs so that they can function optimally in their daily life routines.

Following on from the Wilbarger Approach in 1997 Professor Winnie Dunn developed the model of sensory processing (see Appendix 8A) as a method of recording an individual’s response to sensory input. The model features four quadrants, sensory sensitivity, low registration, sensation seeking and sensation avoiding and once a person’s sensory pattern is revealed, each quadrant provides clues as to what their sensorial needs and abilities might be.

Though the interventions mentioned above are widely practiced in the field of occupational therapy, it is important to recognise that people’s attitudes and environmental design are also important factors that can have an impact on the lives of individuals with unusual sensory processing patterns. As explained by Dr Olga Bogdashina it is important to consider that, it is not just the occupational therapist but the wider audience of society that also needs to be sensitive to people’s sensorial needs. Many a time autistic individuals have been ‘pushed’ beyond their limits of sensory endurance. Often this is due to those relating to them not having understood

⁵ Wilbarger, J, Wilbarger, P. (2002), ‘The Wilbarger Approach to Treating Sensory Defensiveness’, in: Sensory Integration: theory and practice In Bundy, A.C., Murray, E.A., & Lane, S. (Eds.). Sensory Integration: Theory and Practice, 2nd Ed. F.A. Davis, Philadelphia, PA.335-341 (335)

how 'painful' it is to be overloaded by too much sound; visual stimulation; emotional or/and physical demand and environmental expectation⁶.

OCCUPATIONAL THERAPY AND DESIGN

Several books and films have helped to provide an insight into a perspective of life experienced by individuals with disabilities. For example books such as Mark Haddons, *The Curious incident of the dog*, Oliver Sacks *The Man who Mistook his Wife for a Hat*, *Thinking in Pictures*' by Temple Grandin', together with films such as '*The Diving bell and the Butterfly*' and '*Her Name is Sabine*', Winner 2007 Cannes FIPRESCI Award and the 2009 exhibition '*Madness & Modernity: Mental illness and the visual arts in Vienna 1900*' at the Wellcome Trust, London.

Today with a more integrated society individuals with disabilities are increasingly accepted as members of the community. However a significant proportion of people still need continuing support and care to cope with in their domestic and external environment. For example autistic children become hypersensitive (overly sensitive) or hyposensitive (under sensitive) to their environment, developing ritualistic and self-stimulating behaviours such as spinning, flapping and tapping in order to give them some sense of control over their environment.

Dr Olga Bogdashina expresses that, 'If people with Autism have to live continuously in an environment that does not take into account their sensory sensitivity then they live in an atmosphere that makes me think of 'Posttraumatic situations'. In such situations neuro-typical people also develop acute sensory problems. Information overload may lead to sensory and emotional hypersensitivity and therefore a situation of chronic stress' ⁷.

We all have different needs, wants and abilities yet it is the extreme-user whose voice cannot be heard that needs to be considered, to ensure society can adapt

⁶ Bogdashina, O. (2003) *Sensory Perceptual Issues in Autism and Asperger Syndrome*, London & Philadelphia: Jessica Kingsley Publishers, 11

⁷ Bogdashina, O. (2003) *Sensory Perceptual Issues in Autism and Asperger Syndrome* London & Philadelphia: Jessica Kingsley Publishers, 16

and accommodate both their mental, physical and sensory needs and capabilities. With this the role of the Occupational Therapist borders on user-centred design, where they design possible strategies to alleviate any difficulties people may experience. Their knowledge on human behaviour can be an important voice that can inform designers of the unusual sensory processing patterns of the extreme user, which will in effect give us an insight into the sensory processing patterns of us all to produce universal design solutions.

With a more integrated society, universal design is of the essence and the extreme user holds a prominent position within the field of design, with this, the designer requires a new set of skills and knowledge. Despite the pioneering inclusive designer, Patricia Moore and Dr. Temple Grandin many designers may not have the personal experience or training to understand or interpret an individual's own unique mode of non-verbal communication, so to determine their needs, wants and limitations can be very difficult. Likewise, an Occupational Therapist may find it difficult to put their understanding and expertise of the extreme user into practice of creating design solutions. Therefore an exchange of knowledge between the skills of a designer combined with the knowledge of an occupational therapist associated with human functioning, person-environment connection and disability, would create the perfect platform and pool of information for a truly universal, inclusive and human-centred design approach.

A Future Intervention: Occupational Design

In response to globalization, technologies, new communication, demographic and environmental change the field of occupational therapy has taken on new forms of practice. We are all sensory beings and possess different sensory processing patterns and thresholds. Owing to newly transformed technological environments our sensorial tolerances are being challenged. The impact of technology can almost be likened to a disease, which is infecting our environments, creating damaging physical and mental side effects. Disrupting our sensory processing patterns and challenging our sensory thresholds, with this environmental adjustments are being made.

To compensate for auditory overload quiet carriages have been introduced on trains, no mobile phone zones in many public spaces, massage chairs in busy congested airports, together with building regulations, environmental regulations (BREEAM), social regulations (common law) that are concerned with individuals' well-being.

As technology is changing the sensorial qualities of our environments and affecting our health and wellbeing, the field of occupational therapy may soon extend and be of benefit to everyone. It is estimated that 10 per cent of people have a sensory integration dysfunction and that sensory integrative problems are found in up to 70 per cent of children with learning difficulties⁸. Considering this, able-bodied individuals may soon warrant sensory treatments offered in occupational therapy.

Already MSEs are being adapted into businesses and mainstream schools. In 2009 occupational therapist Professor Winnie Dunn published her book; '*Living Sentionally, Understanding Your Sense*', which educates us about our sensory profiles and how our sensory thresholds can effect many aspects of our daily lives.

Winnie Dunn explains that, 'Sensation is the common language by which we share the experience of being human; it provides a common ground for understanding'⁹ Considering this, Dunn's Sensory Processing Model could be used as a template for designers to gain a deeper understanding of the common language of sensation and support Occupational Design. In support of this Catana Brow et al (2001) investigated *The Adult Sensory Profile: Measuring Patterns of Sensory Processing*. The outcomes of this suggest that, service providers can use results of the Adult Sensory Profile to design more effective interventions. Such interventions might include environmental adaptations to support performance. For example, persons

⁸ Bogdashina, O. (2003) *Sensory Perceptual Issues in Autism and Asperger Syndrome*, London & Philadelphia: Jessica Kingsley Publishers 133

⁹ Dunn, W. (2001) 'The sensations of everyday life; empirical theoretical, and pragmatic considerations', *The American Journal of Occupational Therapy*, 55 (6) November/December 608-620 (608)

with low registration may need stimuli to be intensified, whereas persons with sensory sensitivity may need a reduction in intensity or quantity of stimuli to avoid distractibility¹⁰.

This investigation reveals that the sensory profile could be an important tool for designers as well as healthcare practitioners. Combining the outcomes of Dunn's Sensory Processing Model with a 'Snoezelen®' approach to environmental design, will guide designers to design and adapt bespoke products and environments that meet individuals sensorial needs, enhancing wellbeing and quality of life for everyone. I am sure if we had done this in the first place quiet carriages would have existed a long time ago.

¹⁰ C.Brown, N. Tollefson, W. Dunn, et al (2001) 'The Adult Sensory Profile: Measuring Patterns of Sensory Processing', *The American Journal of Occupational Therapy* 55(1) 81

Appendix 2A

A review of the International Snoezelen® Symposium, Germany, 2008

Finally I found myself immersed with people who share the same passion for and interest in the Snoezelen® or multisensory environment (MSE). It was the Snoezelen® Symposium, organised every year by ISNA (International Snoezelen® Association) hosted by Ad Verheul the founder of the MSE and Prof Krista Martens of Humboldt University, Berlin. It took place over 3 days in a school for the blind in Neuwied, Germany. Approximately 250 people gathered from 25 different countries including Denmark, China, Australia, and USA. I represented the UK. The majority of people were experts in the field of MSE, involving caregivers, occupational therapists, physiologists and teachers. I was the only designer. This felt strange at first, but the more the conference unfolded the more I felt a sense of the importance me being the only designer there made to me and to others.

There were a number of workshops, the majority of which were for practitioners to share their practical skills and experiences. These involved workshops on multi-sensory approaches in psycho geriatric units, musical instruments, MSE for people with mental disabilities, MSE for trauma and for the blind and visually impaired. I noticed during these workshops that there was a continuous reference to the sensory props and the design of the room. It actually seemed impossible for a practitioner to describe a sensory session without referring to the handling of the equipment. This, it seems to me, makes it urgently necessary for design to be at the centre.

There were two commercial Dutch companies present taking the opportunity to promote their sensory equipment. Their products were not too dissimilar to those found in the UK. I approached each company to gain an understanding of their design approach. Both automatically eagerly showed me their new range of products, involving high-tech digitally controlled equipment.

The Symposium attracted a mixture of ages and I was fortunate to stay with students from Humboldt University in Berlin. It was refreshing to be with young students who were more than eager to share their experiences. One

student, Matius, is studying computer science and his research is looking at BIO signals as an accurate method to measure an individual's response to an MSE. Professor Hiroshi Anezaki is from Japan working at Humboldt University and conducted research on relaxation effects of Snoezelen for infants with severe motor and intellectual disabilities, using heart rates as an indicator.

The common thread throughout the Symposium was the growing concern about the lack of published controlled empirical data to prove the benefits of the MSE, as most studies are largely qualitative that are not open to generalized findings. Gillian Hotz, a neuropsychologist from Miami, focused on this and talked about the detrimental effect it is having on funding and on attitudes towards the MSE. Paul Pagliano, from Australia, talked about evidence-based practice in the multi-sensory environment and stressed that to conduct studies on the MSE we cannot use the same methods used in medicine. He felt it is important to move away from a medical to a more ecological model, where the evidence based practice can be adapted to suit the MSE

An interesting aspect of Pagliano's talk was when he referred to Herbert Marshall McLuhan, a Canadian philosopher and media analyst, who coined the phrase "The Medium is the Message" ¹. Different media invite different degrees of participation, enhancing one sense or several. Modern media can be seen as extensions of human senses. Pagliano feels there is a symbolic relationship between this concept and the MSE whereby the room is the medium, which communicates to the individual, which is not possible in the outside world.

The closing speech of the Symposium was by Ad Verheul. He briefly mentioned that he is currently going through a court case with ROMPA to win back the rights to the word Snoezelen® which is now widely referred to as a Multi-Sensory Environment. Ad reflected back on how the concept began its journey to where it is today, and also stressed the need for valid empirical research. Ad described an experience that involved a person from outside the

¹ McLuhan, M, Fiore, Q (1967) *The Medium is the Message*, Penguin Harmondsworth

profession from a funding body who visited the MSE in De Hardenberg who wanted to experience a sensory session at first hand. This proved to be a problem, as due to the nature of our society we live a fast paced life and expect fast results, therefore find it difficult to digest when results are slow and so subtle they can be difficult to see. This is the nature of the MSE and people find this difficult to accept so often walk away very disappointed and disillusioned. To witness the positive affects of the MSE is a long process, which might take weeks, months or even years and as a consequence constitutes threat for future funding opportunities.

This left me confused with the thought of how can we organize controlled testing when each sensory session is so unique for each individual which is adapted to address their own particular and needs and abilities. To register positive behaviours may also take 1 week for one person or several weeks or even months for another.

Ad closed his speech by referring to the design of the MSE, the first mention of 'design' throughout the entire three days. Ad feels that the MSE is changing due to all the new technologies and urged practitioners to not get too seduced by them. He feels it is changing the MSE into a predominantly visual environment, removing the sense of touch. Ad, mentioned his new book *Snoezelen Materials Homemade* that promotes the early sensory props, rich in textures and materials.

To conclude, the Snoezelen® Symposium reconfirmed my thoughts that there is a gap in research and lack of concern for the design of the MSE. I was left baffled that there was so little mention of design during the symposium. I was interested when Ad expressed his concern for new technologies and his confidence that people will start to revert back to simple props, high in materials and textures, in fact to a 're-materialisation' of the MSE.

Appendix 2B

A review of the International Snoezelen® Symposium, Denmark, 2009

A Rehabilitation of our Senses through Design

The 7th ISNA International Snoezelen® Symposium 2009 took place in the Village of Solund, Denmark, home to 230 developmentally challenged adults. This was held in conjunction with the unveiling of The Golden Horn, the largest Snoezelen® or multisensory environment (MSE) facility in the world made of ten sensory environments.

The managing director of the Village of Soeland, Maurits Eijgendaal and Senior lecturer at VIA University College, Demark, Anne Eijgendaal hosted the symposium. There were a record number of 470 participants from 17 different countries and 23 workshops were offered. These ranged from sound massage, research about the effects of Snoezelen® on bio signals, Snoezelen® as a platform for socialization ad interaction between children, through to how the Snoezelen® has influenced day-to-day care on Psycho geriatric units.

That year I was no longer the lone designer but one of several. The architect and set-designer Thomas Kruse gave a keynote presentation of his design practice, speaking about his year long project designing sensory rooms for two Kindergarten schools. I was also invited to present my research in a workshop titled 'Snoezelen®: A material orientated design approach to encourage touch and movement' and showcased my interactive textile project 'Tip-Tap Touch' especially commissioned for the Golden Horn. Alongside my workshop there were other workshops concerning design, such as, how to build your own Snoezelen® equipment, how to design a perfect Snoezelen® environment

In contrast the 2008 conference 'design' was no longer a taboo word but one that was often repeated, and no doubt triggered by the development of the Golden Horn. This is a beautiful curved building, furnished with carefully selected products and new digital technologies that are steered into a positive

direction to create new sensorial experiences, to help improve the quality of life and wellbeing of individuals who enter it.

As the conference proceeded I found myself in the Golden Horn submerged in a pool of balls and relaxing on vibro-acoustic and vibro-aquatic beds, which could not be realised without technology. How ironic, I thought to myself, so critical towards technology yet it is the very material of which makes this pleasurable experience. Feeling slightly uneasy about this self-discovery and the realisation that my writing may well be filled with contradictions, I began to realise that technology itself is a complete contradiction, we love it, we hate it, we love it, we hate it, we love it. – Ambivalence is an inextricable part of our relation to external environments.

Stepping outside the Golden Horn you are surrounded by beautiful, contemporary, state of the art apartments, which home to each of the residents. Looming in the near distance are the old corridor-style pavilions, once home to the residents but now offices for the staff. The Golden Horn radiates optimism and illustrates the changing attitudes towards people with disabilities through the evolution of inclusive design within architecture and through the promotion of participation and independence.

'Ironic' was a word that came to mind throughout the duration of the conference. Ad Verheul's workshop 'How to build your own Snoezelen® equipment' was supported by his experience of developing the first ever MSE, De Hartenburg in Holland. He promoted inexpensive hand-made props, rich in materials and textiles that prioritize the sense of touch, which he feels is an important sense that appears to have been removed from many contemporary MSEs. Ironically, 30 years later the launch of the Golden Horn, the most contemporary MSE facility of our time, whereby on entering you are visually bombarded with a 20ft curved flat screen embedded into the floor snaking its way through the centre. Walls were lined with expensive flat screens and interactive projections on the floor, the home of Bill Gates some how springs to mind....

The fact that the MSE at De Hartenburg continues to function successfully is evidence to show that a low-tech environment can operate just as effectively

as any high-tech environment. Only time will tell how effective the Golden Horn will be in 31 years time. With the closure of De Hartenburg looming in the next fifteen years due to deinstitutionalisation, and in January 2010 Maurits Eijgendaal having been appointed as the head of ISNA (International Snoezelen® Association) the Golden Horn may soon become the next role model and MSE icon.

If this is the case the Golden Horn could well set the precedent for how a MSE should be; an expensive, high-tech visually stimulating environment. This is far removed from the traditional concept of the traditional MSE, distorting the original concept where practitioners may feel compelled to develop their MSE similar to that of The Golden Horn. However, without the capital or space to accommodate even a fraction of what the Golden Horn has to offer, organisations may feel intimidated to provide such a facility, especially within domestic homes where it would be impossible for families to accommodate, finance and maintain these types of new digital technologies.

However, whilst technology creates unique sensorial experiences that cannot be realised otherwise, it is important to remember that so too do low-tech materials and textiles, which as yet cannot be replicated by technology. So here is an opportunity to not separate but to combine the two, celebrating both their unique aesthetics and experiential differences and qualities. In support of this I was asked as a textile designer to develop work for the Golden Horn that would be positioned amongst the flat screen technologies. Anne Stern a music therapist at Solu..nd commented on my work that, “when you come into the house it gives you a feeling of “grounding” to see these pieces of art made of quality-material with soft colours and patterns, hanging in each “cave” in the corridor.”

In 19th November 2009 I presented my MPhil research and practice to thirty-seven health care practitioners ranging from occupational therapists, music therapists, physiotherapists and psychologists, including Professor Paul Pagliano of James Cook University, Townsville, Australia and Prof. Dr Krista Martens the founder of ISNA. Approaching the MSE from the perspective of a textile designer, I was initially a little concerned that my research might be too

far removed from that of the world of a health care practitioner. However one and a half hours later I received positive feedback that my research offered something new and inspiring. I was also approached by occupational therapists who were interested in future collaborations. Through conversation it became obvious that collaboration between the skills of a designer combined with the knowledge of an occupational therapist associated with human functioning, person-environment connection and disability would create a powerful platform for doctoral research concerned with universal and human-centred design.

The Golden Horn is an exemplary instance of inclusive design where the sensorial needs of the user has led the design brief, and it is a role model for how we all should have a 'Snoezelen®' approach to environmental design as a whole. Both myself and other healthcare practitioner's physical reaction to the Golden Horn was that of excitement, relaxation and curiosity proves that by designing for the extreme user, an environment can be developed that is universal to everyone. Though it is not us but the residents of Soeland (the users) who will judge its success. What can be said is that it is thanks to the Golden Horn that design has become an accepted and important 'tool' within the Snoezelen® field.

Ironically during the Snoezelen® Symposium, the neighbouring town of Aarhus hosted a solo exhibition by Jeppe Hein, entitled 'Sense City' at the Kunstmuseum. It is to be hoped that as the MSE continues to grow and develop the 8th International Snoezelen® Symposium in Alabama USA, 2010 will attract a more cross-disciplinary pool of participants.



The presentation will give an overview of what was done so far and what are the next immediate steps. First I present the biosignals we measure and why they are chosen. I give examples of the practical realization of measurements and how to include them into Snoezelen sessions. I show typical problems that occur and how to deal with them. Then I present a (free and open) software we developed in order to conduct studies in an MSE. The grand purpose is to establish an ISNA-wide standardized method of biosignal measuring that can be conducted by any Snoezelen assistant. This enables the ISNA to show results that are reproducible and comparable.

Language: English,

A4

Katie Gaudion, Textile Designer

SNOEZELEN: A material-orientated design approach to encourage touch and movement

The MSE has developed into a less material and more virtual space of disembodiment, where activation of the mind takes precedence over the body, affecting both the mental and physical experience of touch and movement. My presentation is a re-evaluation and reassessment of the design of the MSE from the perspective of a Textile Designer. Regaining the authority of textures and materials, my practise capitalises on the natural infinity they lend towards privileging the stimulation of the senses.

Language: English

A5

Tina Modh and Carola Klint Edlund, Occupational Therapists

To drive free as a sensory-experience: "experience driving" in a Permobil Entra Tiro.

Lagunen and Korallen are two multi sensory centers in Stockholm Sweden, offering stimulation for all senses. Persons who have difficulties in perceiving as well as taking part in the experiences of daily life, can do so here and very much at their ease. We have different sensory rooms that can offer this. We wanted to give the opportunity to get independent motion stimulation. For that reason we made a study to evaluate if free driving with a Permobil Entra Tiro can give sense stimulation on the basis of the "model" that is used at Lagunen. This chair is a kind of powered wheelchair which is designed by Permobil and the occupational therapist Lisbeth Nilsson. The chair gives the opportunity for training to move freely. At Lagunen we wanted to integrate the Entra Tiro-chair as a way of experience free move stimulation.

Language: English



Appendix 2D

A review of the Plastic Electronics Conference,

Dresden, Germany, 2009

SMART?

It is ironic that on my way to the Plastic Electronics Conference in Dresden 2009 I found myself spending 5 minutes in a washroom wondering why the water wasn't coming out of the tap, to then realise my hand was not inline with the sensor? I got a little lost and waited 5 minutes searching for a person who was not preoccupied with their mobile or ipod, to ask for directions. I almost bumped into the glass door, as I had anticipated that it was automatic. Our waitress the evening before was unable to divide the receipts, because the computer said no, and for some reason she could not write them by hand. Isn't technology mean't to make our life easier?

The Plastic Electronics Conference hosted several presentations on the subject of integrated smart systems, Smart Fabrics and Intelligent textiles. Several key words were repeated throughout the two days; Electronics, plastic, sensors, biosensors, interfaces, printed, smart, OLED, wearable, e-textiles, interactive, intelligent, flexible, stretchable, transmitters, semi-conductors and transistors. These words, together with a visual bombardment surrounding the recurring theme of measurement, illustrated in bar graphs, pie charts, more graphs, figures, figures and more figures left me in a state of confusion and intellectual inadequacy.

What I did begin to understand however was that what was not being addressed or discussed was the application and the user. In contrast to the way I work, it appeared that within the field of organic plastic electronics, both the user and application appeared to be an after-thought, which had to then fit around the electronic innovation. Or take the risk of creating their own human need for example the mobile phone that switched from a luxury to a necessity.

With reference to the applications mentioned such as the talking shoes and others I couldn't help but question, why? Do we really need it? One

organisation prided itself that if put the user's needs first. Based on its belief that all humans are inherently lazy, the designers produced a new electronic survey that fits around a Coke can. It was to make life easier for the consumer as he or she only had to press on the can to then register their satisfaction or dissatisfaction with the product, instead of having to go home and switch on their computer.

Several questions come to mind: Is the innovation primarily of benefit to the user or just more efficient? Should we be encouraging this so-called lazy human characteristic by making things easier? If we continue to design products that continually makes things easier for us, the lazier we get then the less satisfied we become. The point is meant to follow that the less satisfied we become the more we want to satisfy our needs through products.

NEED-WANTS-NEEDS-WANTS-NEED-WANTS-NEEDS-WANTS-NEED

What is the difference between humans needs and wants? Our wants over our needs, opens the door to unlimited inventions and products. The products that satisfy our wants may then create or become a human need, the never-ending cycle needs and wants begins.

We are all sensory beings and possess different sensory processing patterns and thresholds. Consequently, as technology encroaches into our environment quite often small adjustments have to be made to accommodate everyone around us. For example, the sound projected from the ring tone and chat on mobile phones is something we cannot switch off. We do not have ear-lids therefore we now have 'silent carriages' on trains.

Throughout the conference I constantly reflected on my research, which is concerned with individuals whose needs and wants are quite often not being addressed. An important group is those individuals with unusual sensory processing patterns such as those with autism, whose internal and external world can become a very confusing and lonely place.

I found myself promoting the multisensory environment (MSE) as being the perfect platform whose companies could apply their new electronics to help create unique experiences that could be adapted and modified to suit an

individual's sensorial needs and wants. There was a genuine interest and fascination which led to conversations that went beyond sensors and flexible circuit boards to family and friends who had been touched by autism and Alzheimer's disease.

The conference reconfirmed for me the important role of the designer and their duty to always question new electronic innovations, and to consider the effects they have on us now and in the future. General society continually creates and re-creates/demands new needs and wants. However the MSE is an opportunity for innovators genuinely to make a difference and cater for the needs and wants of individuals, which may have never been properly recognised or met before.

As we are sensory beings it is not surprising that it is important that innovators and designers address these too. By understanding our sensory responses we will begin to understand human behaviour, which will give us the opportunity to enrich our sensorial surroundings and wellbeing as a whole, which is what I call smart.

Appendix 3A

Stepping inside the MSE...

I take off my shoes and socks, pull back the heavy velvet curtain, a shower of fibre optics brush passed my body, my feet touch the soft, 'milky way' carpet, a shimmering effect with dots twinkling and changing colour.

I can hear the sound of gentle music in the distance; my feet sink into the soft white, cool, padded PVC floor, which extends onto the surrounding walls.

In the corner, to my left, a transparent illuminated plastic cylindrical tube of water catches my eye, a stream of bubbles ripple frantically ascending to the top, with a gentle hum that fades into the background. I reach over and touch the smooth tube, warm, gentle vibrations run through my finger. There was a panel of buttons where I could change the colours but they did not seem to work.

I start to wobble as I stand on a PVC waterbed, the whole surface starts to move, I almost lose my balance so I crouch down and move my body from side to side. The floor waves and ripples around me, with the sound of swishing water, a subtle movement of the arm or leg or slight turn of the head causes a surge of water.

Long ponytails of plastic fibre optics are attached to the wall behind, I drape them over my lap, they have an electric glow, and I bend and wind the optics through my fingers and toes. I pull them closely to my face peering closely at the intense light, enhanced by the dim lighting.

A mesmerising collage of abstract shapes in primary colours parade around the room, following the contours of the far walls and ceiling, creating a perception of space. I crawl up three steps where I am confronted with a series of mirrors, revealing multiples of myself. Two plastic cylindrical bubble tubes stand proud at either end, drifting from white light through to red, green and blue.

I slide down the soft slope brushing past a silver blanket creating a crinkling noise. I lie down for a moment, feeling relaxed. This moment of relaxation did

not last for long, I started to smell the PVC that was giving me a headache, and the hum of the bubble tube that sounded like the hum of electricity. I was lying in the middle of the MSE and there was nothing to reach for, everything was positioned around the walls. I wanted something comforting like a blanket or something soft that I could squeeze but everything was static and made of hard materials. There was a tactile panel attached to the wall that I could just about touch but when I closed my eyes all of the textures felt the same...wood, plastic and the occasional bristles of a brush. It was a sunny day outside and all I could think about was lying on a carpet of fresh smelling grass with the sound of birds and warmth of the sun beating on my face.

FACT, January 2007

Appendix 3B

Half an hour with Kevin...

Kevin is non-verbal and paralyzed from the shoulders down. The bed is his most immediate environment followed by the small residential home where he lives. There are ten residents all together, the majority of which are elderly with dementia. Kevin is the youngest, he is 32 years old and came to the residential home due to a tragic car accident that left him in the need of 24-hour care, his parents visit him every day.

Kevin is always to be found in the corner of the room, where he lies down amongst the olfactory delight of bleach and the background murmur of the television in the next room. The magnolia walls around him are blank, there is nothing to look at and the only stimulation he may experience is from his parent's visits and the daily routine of washing and eating.

Kevin seemed particularly down today, his head is tilted awkwardly to one side, his gaze transfixed onto the lino floor and his mouth locked open. Neither my presence nor the stroke of the forehead makes him stir.

"It's your turn next Kevin. Dorlies and I are going to help you into the sensory bus, is that ok?"

It's a lovely sunny day and we wheel Kevin's bed outside into the fresh air. The sun shines, reflecting onto the white sheets. Kevin's blank gaze starts to stir and his eyes slowly move in response to the elements outside.

"Kevin, we are just going to wheel you onto the lift and into the sensory bus, so once you are inside it might be dark for a few moments, before we turn the lights on."

We close the van doors and Kevin's head is still tilting uncomfortably to one side. To gently ease Kevin into the new environment we project colourful patterns in the direction of his gaze, his eyes immediately respond and begin to track the movements of the shapes.

“Kevin, I’m just going to put some music on, what do you fancy? How about the new Jack Johnson album?”

The music and projections of colour seem to work well together. I sit with Kevin listening and watching the shapes. His face already appears to be relaxed, his mouth slowly starting to unlock and move.

To encourage Kevin to move his head I turn off the projector and switch on the fibre optic panels installed in the ceiling directly above his head. Kevin responds instantly to the optics. He begins to make positive loud noises and moving his head in what appears to be an attempt to stretch up and touch the fibre optics.

I glance towards my watch, the half an hour is over, and it is time to wheel him back to his corner.

It was a shame that the session was so short, but still half an hour in the sensory bus was enough time to take Kevin out of his normal routine. The sensory bus activated Kevin, as Kevin could only move his head it was important that the sensory props could follow his gaze. This is why the projector worked well as the moving patterns covered all perspectives, and the movement encouraged him to move too. The fibre optic panel in the ceiling was a great success as it was positioned directly above Kevin, I could see that he almost wanted to reach and touch the optics. I think next time I will adapt the panel with a ‘shower of textures’ that Kevin could touch if he was to slightly raise his head, also if it’s a nice sunny day I might see if Kevin would respond well to part of the sensory session being outside.

FACT: Sensory bus, April 2007

An hour with Tim...

It is Tim's first visit to FACT (Federation for Artistic and Creative Therapy) Tim is an adult wheelchair user and is non-verbal. He lives in a residential home and has developed self-stimulating behaviours of chewing of his fingers and grinding of the teeth.

As the MSE is unfamiliar, I decide to make this an introductory exploratory session where I gently introduce him sensory props and observe Tim's reactions, in the hope of gagging his likes, dislikes and abilities.

Tim understandably looks very nervous and uncomfortable, the slightest unpredictable noise or movement causes him to jump and begin grinding his teeth and chewing his fingers.

Tim sits with a tense posture no doubt somewhat due to the wheelchair that is far too small for him. There is also no footrest so his legs are left to dangle. To take the pressure off his legs, I immediately take a piece of foam and position it underneath his feet.

I talk to Tim throughout the session to familiarise him with my voice and to help me gauge just how much he can understand. As Tim is an adult I am conscious to communicate with him in an age appropriate manner, unsure of his cognitive ability it takes time to get the right balance.

As Tim was nervous I tried to create a relaxing environment to calm his nerves, switching off all the equipment and lights aside from the bubble tube and with gentle soothing music humming in the background.

I spend the majority of the session touching and stroking Tim's hands which were tightly clenched, nestled either to the side of his chair or in his mouth. After approximately 45 minutes Tim opens one of his hands and lets me hold it. As I cup his hand in mine, I gently stroke his fingers using the bristles of a soft brush. Tim responds to the different texture and raises his head, only to notice the bubble tube. He becomes transfixed and his posture is a lot more relaxed.

Tim is a very nervous person so for the next session I will play some relaxing music and make sure that all of the other equipment is turned off, he does not like sudden movements or changes in his environment that he is unfamiliar with. Tim responded well to the tactile sensation of brushing on his hands for the next session I will gently introduce vibration.

FACT, March 2007

An hour with Tim...

The bubbles of the tube can change into four different colours at the flick of a switch. Tim responds immediately to the colour red. Stopping and starting the bubbles in ten second intervals. I watch as Tim tracks the ascension of the bubbles with his eyes, echoing the movement with his head. When I stop the bubbles altogether, he eventually looks at me as if to say in protest “where have they gone?!”

Over time, Tim has become more relaxed and comfortable in the multi-sensory environment (MSE) His hands are no longer so tightly clenched and he appears less nervous and reactive to spontaneous noise. While he still spends a lot of time chewing his hand, he grinds his teeth less frequently.

As Tim is prone to falling asleep, I feel it is important to create a more interactive, less passive session. I introduce a guitar to deter him from chewing his hands. I gently place it onto his lap and start to strum; the strumming of the strings sends a subtle vibration through his legs.

Tim immediately reacts to the sound and vibration of the guitar. When I stop playing he looks towards me as if to say ‘play more.’

After approximately twenty minutes of strumming I place Tim’s fingers onto the strings so he could feel the continued vibrations of the strings as they peter out. Tim would not engage with this at first and would immediately pull his hand away, placing it directly back into his mouth. I repeatedly place his hand onto the strings and eventually, Tim independently moves a single finger against one string, flicking it back and forth, producing a sharp sound. Tim

continued to strum on this one string, doing so for two to three minutes at a time, before pulling away.

As Tim played the guitar he began to smile, moving his body as he made slight noises 'dancing and singing to his tunes.' It was great to have identified a prop that he enjoyed and could focus on. The guitar seemed to have energized him and distracted him from chewing his hands.

After approximately thirty minutes of playing the guitar I then place a plastic keyboard onto Tim's lap, running my fingers along the keys. Tim tracks the movement with his eyes and moves his head towards the sound. His interest begins to fade. Tim was more responsive to the guitar; maybe it was the combination of the vibration, sound and touch of the strings that he enjoyed.

Tim responds well to the combination of music and vibration, he has a good understanding of cause and effect it did not take him long to realise that the strumming of the guitar strings created the music that generated the haptic experience of the vibrations. With this he would strum with more force so the sound would be louder and heighten the tactile sensation of the vibrations.

The strings of the guitar encouraged Tim to unlock his clenched fingers who appeared very comfortable with the simple action of 'flicking' the strings. I introduced Kevin to a plastic keyboard as I felt he may also enjoy the instant cause and effect of touch and sound, but he was not as interested. This may have been because it did not vibrate, the keys required the action of pressing rather than flicking which appeared more difficult and the Kevin may have enjoyed the texture of the strings rather than the plastic keys. Next time will introduce Kevin to the beaded drum that creates an intense sound and vibration with very subtle movements.

FACT, April 2007

Group Sensory session...

Rachel's mobility is limited, I manage to guide her onto the waterbed where she is able to stretch and feel the response of her subtle movements. The ponytail of fibre optics is the only sensory prop within easy reach. Everything else is either fixed statically to the wall or at either end of the room away from the waterbed. I bring the box of tactile props close to her, I sieve through the limited range to try and introduce her to something new.

I peer over at Mo who is sitting at the top of the slope yet again transfixed by the bubble tube, I think he would spend all day watching the bubbles if he could. I give up on the box of sensory props, most of them are plastic, too small and require an action (pressing, shaking and flicking) in order to activate them. Rachel would have difficulty handling them independently and the physical action required would be beyond her capabilities.

So, I reach for the fire blanket, a simple prop, lightweight, which the whole body can interact with. I lay it over Rachel's lap, as Rachel makes small movements, instantly the blanket makes a loud crinkle noise and waves in the air.

Undisrupted by my presence, Mo continues to be mesmerized by the bubbles. I bring out the circular plastic pressure pads, which activate, stop and change the colours of the bubbles. I present it to Mo to try and coax him away from the bubbles. It is difficult for Mo to associate this object with the bubble tube, and, understandably, the flat plastic texture and solid shape do not lure or tempt him away.

I peer over at George at the other end of the space and can hear him grinding his teeth his head is tilted back looking up at the blank ceiling. I try to angle the projector to the ceiling in the direction of his gaze. However, the ceiling is grey so the moving shapes are difficult to see.

Today's session was a little frustrating, it is so difficult to facilitate a group sensory session and try to accommodate to everyone's sensory thresholds, I really need to look for more tactile props that do not enquire specific actions. The safety blanket worked well with Rachel so I think I will put some lengths

of fabric into the tactile box with different textures and sounds. Mo is always transfixed to the bubble tube this worries me as he is just sitting static and watching the bubbles, I am keen to introduce something new, that moves away from the sense of sight. I will think of something tactile that I can attaché to the bubble tube to extend the sensory experience. I will talk to Phil about getting ceiling painted so that the projected patterns are more visible.

FACT, February 2007

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An hour with Dom...

One of the benefits of the MSE is that it houses an assortment of interesting sensory props, which interact and stimulate the service-users in ways in which words cannot.

The prop, the 'tweeting bird', often creates interactive multi-sensory experiences, as users respond to the textures of the bird and the tweeting sounds it makes. Dom, a non-verbal six-year-old boy, reveals his unique personality through various sounds and facial expressions he makes when reacting to the bird. At the beginning of each session with Dom I always start with the tweeting bird, as I know it is something he really enjoys. He relates the bird with his surroundings in the MSE, giving him an immediate understanding and awareness of where he is.

The tweeting bird was a great tool that encouraged Dom's personality to shine through. This simple prop informed me of Dom's way of communicating through his eyes and familiarized me to his unique sounds and facial expressions.

I stop the tweeting of the bird, asking Dom if he would like to hear the bird tweet again. He would respond encouragingly through blinking. I move the bird as if soaring through the air, moving in different directions around his body - above his head, to the side of his face and by his arm. Dom instantly responds, following the bird with his eyes and head.

Conscious that the tweeting bird might get a little repetitive for Dom, I introduced other audio-tactile props, for example, shakers and the strumming of a guitar. After approximately 20 minutes of audio-tactile stimulation I turned on the projector, which created a colourful moving ocean scene on the wall opposite Dom, which he instantly started to track using his eyes.

For the rest of the session I decided to concentrate on Dom's feet. I was very conscious that I have not touched Dom's feet before which can be a very sensitive area for many of us. I very slowly took his shoes and socks off waiting for any flinch or response. Dom's feet were initially very tense with his toes tightly clenched so I gently applied some massage cream to his feet,

which I let Dom smell first. As I gently rubbed the cold cream through his feet Dom let out a soft releasing breathe of air whilst still transfixed onto the ocean scene opposite.

As I continued to massage his feet, Dom's toes begin to slightly open and gradually became less tense. As Dom's feet visibly loosened I then introduced two different vibrating props.

I began by placing his feet onto a foam tube, which emits subtle vibrations I then rolled the tube underneath his feet back and forth. Dom started to smile and began to move his head and eyes distracting him from the ocean scene. To ensure that he was enjoying the sensation I took the tube away from his feet and Dom would then independently move his feet forward in search of the tube, which he would find and clip his feet onto.

I tried the same exercise again but with a spiky plastic ball, which emits a very strong, rapid vibration. I placed Dom's feet onto the ball, which provoked an instant reaction. It was quite unusual for me to witness Dom responding so instantly to something, so I repeated this a few times with caution observing Dom all the time. I then took the ball away from his feet and again, Dom independently searched for the ball stretching out his toes and resting one onto the ball, he would then let go of the ball and repeat again with his toe.

Today's session was really interesting; Dom really enjoyed his feet being massaged and particularly the sensation of vibration. It was fantastic to witness Dom for the first time independently making his own choices. Dom also showed great movement in his feet and legs. As he spends much of time in a wheelchair this is definitely something I would like to encourage for the next session. He also showed no signs of tiredness and falling asleep.

FACT, March 2007

An hour with Sarah...

Sarah showed great enthusiasm in the MSE today. She demonstrated this by smiling and clapping of her hands. Sarah showed an interest in music, when instruments like shakers, drums, tambourines and a guitar were placed in front of her. Primarily Sarah did not want to hold onto an instrument herself, instead she preferred watching me play whereby she would clap her hands and eventually take the instrument out of my hands. Sarah would also occasionally drop little wooden balls on the surface of the drum, which rewarded her with a relaxing 'rain sound' and brought a smile to her face.

The different lighting effects visually stimulated Sarah. She enjoyed tracking the moving sea images as well as the slow rotating mirror ball. Sarah would frequently watch the bubble tube tracking the different coloured fish moving up and down inside the tube.

I introduced hand-sized sensory props; Sarah demonstrated a clear preference for them, pushing bigger props away. She enjoys taking props out of my hands and puts them in front of her or to either side. Occasionally Sarah moved from the back of the sensory room to the front to pick up a ball, which is placed in the corner. Sarah seems to really like balls and shows delight when balls from the ball pool are thrown on the floor. This can excite Sarah, clapping her hands and jumping up and down on her knees.

Sarah enjoys the props that she can interact with independently which she can have full control of, which is why she is not interested in the static equipment of the bubble tubes and fibre optics, she is very active and would find it difficult to stay still with this type of equipment. As Sarah clearly enjoys balls, I will introduce Sarah to the sensory props that move which encourage cause and effect and hand/eye coordination such as a slinky.

FACT, May 2007

An hour with Matt...

On arrival, Matt and Sarah greet me excitably and display an eagerness to enter the MSE. Matt displays an awareness of all the sensory equipment by tracking, vocalisation or hand gestures (pointing). Equipment includes overhead projectors, bubble tubes, fibre optics and a mirror ball.

Matt's interaction with the sensory equipment is varied. He displays an understanding of cause and effect, whilst interacting with specially adapted switches that can be linked up to the equipment, allowing the service-user to either turn on and off, stop & start or colour change. During cause and effect activities Matt is not always consistent in his understanding of cause and effect, not linking the switch that he is activating up to the equipment that he is controlling, though this does seem to eliminate his enjoyment of the activity.

Sarah responds positively to sensory props, she enjoys exploring a wide range of musical instruments that include shaker, drums, guitar, rain stick and keyboard. Whilst exploring, Sarah displayed her understanding of each individual instrument and responds to the guitar as a vibration prop, laying the guitar close to her upper body strumming the strings, which in turn creates vibration.

Sarah also enjoys receiving multi-sensory massage on her hand and feet, implemented with various massage props, such as, vibration tube and spiky ball. During this activity Sarah visibly relaxes.

As Matt has difficulties with understanding the switches for the next session I will introduce him to the props that have switches self-contained with in the prop so that he can automatically link that switch to the prop, to eliminate confusion and frustration.

FACT, May 2007

An hour with Steve...

Steve initially was very excited in the MSE and was unable to contain himself. He would test boundaries, which manifested into the destruction of props and Steve's favourite, which is the emptying of boxes. I attempted to implement some boundaries for Steve by removing all props and boxes from the MSE and reintroduce them over time. This gave Steve time to feel comfortable within the MSE and to get to know me without any distraction.

When feeling lively and upbeat Steve's concentration levels tended to dip. During this time his response is erratic and he finds it difficult to stay focused for any length of time. During this time Steve's behaviour noticeably manifests itself into the destruction of equipment/props. Steve also tends to respond positively to negative requests, for example when I asked him to stop his attempts to break a prop, Steve would smile, laugh and get excited.

Over time I began to reintroduce some of the sensory props, which Steve responded to positively. During the reintroduction of props I encouraged Steve to tidy up the props by putting them back in a box and closing the lid, though at first the temptation to tip them over was far greater than putting the props away.

During the end of the session Steve seemed tired, whereby he then began to utilise the MSE in a different way, much calmer and less excitable. He lay on the waterbed, tracking the overhead sensory equipment and listening to the soft music. When Steve is in a tired state he is much more open to massage of the hands and feet using various textures and smells.

Steve is a very active boy, the MSE could help him to relax more, for the next session I will concentrate on this, play soothing music and introduce him to the aromatic props. I will also get a heavy blanket for the next session to see him the deep pressure will help him to calm and relax better.

FACT, March 2007

An hour with David...

I gently touched his arm to let him know that I am there, my first one-one sensory session with David. He is six years old with severe visual impairment, cannot speak and has limited mobility. I first met David at his school where I would often find him on his own, asleep. Most people tended to gravitate towards the other children who tended to be more responsive.

Spending most of his time in a wheelchair, the most effective way for David to experience the MSE is to remove him from the confines and restraints of the chair to enable him to stretch and feel the space between his arms and legs.

“David, would you like to come out of your chair? We are just going to help you into a harness and sit you comfortably in the sensory room, is that ok?”

I wheel David closer to the entrance of the MSE, his eyes light up and move with interest in response to the moving shapes and colours projected on the walls. New to this experience I decide to start him with one piece of equipment and, depending on his response, gradually introduce other sensory equipment.

I ensure David is seated comfortably on a large PVC cushion positioned between the bubble tube and the waterbed. The PVC gets sweaty, releasing an unpleasant smell of plastic. I decide to create a soft and comforting texture by placing a sheepskin rug on top, far removed from the hard seat of his wheelchair. To keep him alert, I make sure he is seated upright supported by an extra cushion, as he is often prone to falling asleep.

David faces a wall, transformed into a projected collage of moving shapes and colours, which continue to swirl throughout the entire room. He tracks the movements with his eyes. I sit next to David to give him the space and time to acclimatise to this new environment. I try to instigate him to move and reach for a delicate piece of silk, by moving it like water before his eyes “David do you want to feel the water? “ His eyes respond so I gently run the silk over his face, he responds with subtle movements of his mouth and cheeks.

“David, I’m just going to roll your sleeves up.”

I gently stroke his arms with a little pressure and delve into the basket of tactile props pulling out a bird made from contrasting textures of fur, feathers and rubber. "David, look what I have found - a tweeting bird!" Squeezing the bird it releases a high-pitched, tweet tweet. "Would you like to touch the bird David?" His eyes respond to my voice and he blinks. I gently press the feet along his arm for a few moments. I repeat the question, his eyes respond to my voice. I stroke David's cheek and forehead with the feathers, this time squeezing the bird simultaneously, tweet tweet. David suddenly makes a noise and smiles. I'm starting to get to know David for the first time.

The tweeting bird was a great multi-sensory prop that worked a great narrative cue. For the next session I will look for similar props that have interesting textures and sounds that create different narratives.

FACT, January 2007

Morning time with Ben...

As I push the swing higher the warm soft summer air blows onto Ben's face. He begins to smile and hum louder creating a duet between his voice and the whispering trail of breeze that sweeps past his ears.

Ben is 13 years old and has been diagnosed with Autism Spectrum Disorder, leaving him unable to communicate verbally. He will take my hand and lead me to the swing; it's his ritual, every morning, come rain or shine. We will spend an hour sometimes longer on the swings. In fact, he never wants me to stop. Ben interacts and responds to the rhythmic and repetitive motion of the swing, humming as he swoops back and forth.

'I'm sorry Ben but I think its time let the other children have a go on the swing'

Ben gets so asphyxiated with the sensation of the swing that it is always difficult to lure him away. I stop the swing and, protected by his soft helmet, Ben begins to bang his head against the rope of the swing. I was alarmed at first by this action, but I now understand that this is just one of Ben's unique ways of communicating. As I help him off the swing he squeezes my hand and continues to bang his head against my arm.

'Don't worry Ben, we can go back on the swing later, once everyone else has had a turn'

Ben then leads me to a chair, his second ritual of the day; he leans over and places the left side of his face onto the seat, pressing his ear, cheek and part of his helmet firmly against the hard plastic surface, whilst simultaneously trying to push the chair along.

'Ben, are you ok, do you want me to help you'

Ben takes my hands and places them onto the back of the chair and puts his face back into position. As the chair tilts I begin to pull, the legs glide along the surface of the textured carpeted floor creating a subtle vibro-tactile sensation, which vibrates through the side of his face.

Outside, the chair legs now battle with the uneven, hard textured surface of the ground, consisting of coarse tarmac, pebbles, cracks, concrete and the occasional abandoned toy. Concerned that this must be uncomfortable for Ben, his face however, remains fixed to the chair. With difficulty I continue to drag the chair, thinking, if only we had a more convenient vibro-tactile prop.

The awkward motion and friction between the chair legs and the hard surface below transmits loud sounds and heavy vibrations through Ben. He starts to hum loudly, creating his second duet of the morning in collaboration with the vibro- tactile sensation of the chair. I continue pulling the chair, as expected, Ben doesn't want me to stop.

Ben loves the sensation of the vibration on the chair as it is dragged over the different textures of the ground. Though I have happy to pull the chair along, this activity is not always that practical, for example when it rains and as Ben gets older I might be more difficult for him to do. It is also a shame that this activity is dependant on he play worker pushing the chair and that he did not have complete control and independence of this activity. I will start to think about a design solution that will create a similar experience but one that Ben can enjoy independently and with in any environment.

Kids Active, July 2006

Appendix 3D

Diary extract: Studio Roosegaarde, Rotterdam, October 2008

Studio Roosegaarde is based in Rotterdam and founded by the artist Daan Roosegaarde, the studio explores interactive technologies and is internationally known for its interactive artworks. These include 'Dune' which is currently on exhibition in Decode at The Victoria and Albert Museum, London and the Sustainable dance floor at club Watt in Rotterdam.

I worked at Studio Roosegaarde between July- October 2008, which was their first experience of collaborating with a textile designer. The following piece of writing is a short diary extract of my experience.

Working at Studio Roosegaarde has taught me a lot about my textiles practice and the way in which I work. I work with materials, I spend time touching, playing and analysing their behaviours, limitations and movements. It is only until I have an understanding of the material that I then start to create.

Working alongside electronic designers has been interesting, such a different way of working. It was fascinating to compare our working space. Mine was consistently piled high with materials and other objects and theirs neat with computers. Even the way in which we physically worked was different, I was often standing high up on ladders, stretching, crouching, pulling and pushing as I manipulated materials. Their actions were confined to a chair using the fine motor skills of their hand and fingers.

Whilst I was at the studio an interactive sculpture called 'Liquid' was being developed. This was a large structure made of white plastic tubes with motion sensors that would move and flash when a person stood underneath it. The first question that came to mind was, why would I want to walk underneath white plastic tubing that moves and flashes coloured lights with a robotic sound of creaking metal?

The plastic tubing did not tempt or encourage me to touch it and the motion of the sculpture was not instant enough for me to play games with it. I would have been a lot more excited if it was reactive to touch, by touching

something you instantly form a bond or relationship with the physical object. Yet the motion sensors automatically removed all contact and created a distance between the sculpture and myself.

As Liquid is programmed to behave in certain ways, its behaviour is always premeditated, removing the opportunity of spontaneity and any element of surprise. I receive far more satisfaction from objects when my spontaneous interactions also elicit and trigger a reaction. As we are all unique individuals we would have different approaches and reactions to the object, therefore every one could 'programme' the object to behave in different ways. The only interaction I had with Liquid was to walk underneath it and look up at the flashing lights. But what if it encouraged you to take off your shoes, use your fingers and body to sit, run and jump? What if Liquid was made of interesting materials that enticed touch, how might that effect the participants' experience of it?

Appendix 3C

A reflection on the first year of my MPhil Research, 2007-2008

Much of my first term was spent thinking about where and how to organise and gather information, starting with a diary of thoughts, which has now escalated into multiple diaries. It was also an important time to locate relevant libraries and web databases so that I could begin to start my literary review. An important contact I made was with the occupational therapy library, which allowed me to use their facilities and access the online medical databases.

FACT –Observations

An important part of my methodology and the inspiration and motivation behind my research project, has been my ongoing involvement with the charity, FACT (Federation for Artistic and Creative Therapy). For the last two years, once a week, I have been facilitating two multi-sensory sessions with both a child and an adult. I observed and took notes of the different interactions and responses they had to the environment and sensory equipment. This has, at a conscious or sub-conscious level, provided me with information which has guided me through my research and practise.

For me, the multi-sensory environment (MSE) fundamentally highlights the importance of sensory stimulation for those with learning difficulties and the clear requirement to re-think the design and quality of the environment and sensory props. Currently, there is a handful of commercial manufacturers who appear to be dictating the design and development of the MSE. Their products are overpriced and limited to solid/rigid materials. The MSE is developing into a high-tech/virtual environment, which focuses more on visual stimulation, hence eliminating and reducing the sense of touch, movement, smell and sound.

To understand and interpret the service-users own unique modes of non-verbal communication has been a long and enlightening journey. Their communication may be as subtle as blinking, making a slight sound or movement of the head. However, gaining an insight into their personality and to develop a relationship of trust for each other has been incredibly invaluable.

Based on my session notes I have drawn up several key observations;

- For individuals whose mobility is limited and use a wheelchair, often, the position of their head is looking up or down, hence, their gaze will be focused on the floor or ceiling. With this in mind, I am conscious that the service-users often approach the MSE from a variety of perspectives and angles. Consequently, it is important to utilize the whole space eliminating the division between the walls, ceiling and floor. Melting them together so they become one blank canvas of equal importance for potential stimulation. I have found that the ceiling is a neglected space, unstimulating to any service-user who is lying on their back or looking up.
- The service-users respond positively to the sensory props that hold a variety of textures and shapes such as, the fibre optics and the fire blanket. These props hold flexible, fluid and malleable qualities, which can be explored through the whole of the body, encouraging the individual to stretch, reach, manipulate and wrap the prop around the arms, fingers, legs, head and feet. This therefore offers a variety of interactions, which are not solely restricted to just one part of the body. They are, in contrast to the props, bound to the sides of the walls or fixed in one place and made of hard solid materials such as plastic and wood. For example, the bubble tube, limiting the range of interactions.
- As many of the service-users are confined to a wheelchair for the majority of their day, I felt it is important to encourage interaction and movement,

no matter how subtle it may be. I discovered the degree of interaction did depend on the sensory feedback of the object. The service-users responded and were motivated by the props which moved and which they could independently move and interact with. These props quite often appeared to reduce the amount of self-stimulating behaviour.

- The service-users attention span can be very limited so it is important that the sensory props have an instant reaction and respond to the service-users movements. The vibrating props were extremely effective as the individual can feel the instant sensation of the vibration. The waterbed was also effective in this respect since it reacts instantly to subtle and big movements of the body.
- The sensory props can be extremely beneficial to those who are tactile defensive as it can almost act as a 'middleman', allowing touch and interaction yet not through direct touch. The ball pool is a great prop, which allows the service-user to use their whole body to explore the balls.
- I found that the high-tech equipment limited the range of movements and stimulation and is beyond the service-users mental capabilities. Consequently, the simple and crude props proved to be more successful. However, I ended up feeling very limited with what I could use in the room and conscious not to repeat the same task over and over. Hence the need for diversity and to revert back to the original concept of the MSE, using textures and materials is very important.
- The props, which are reactive, enable the service-user to experience an instant response and they are therefore automatically engaged. There can be confusion with the high-tech props, as they have switches, which require an individual to press in order to activate the prop, which could be positioned at the other end of the space. Therefore the switch and the

prop can at times look totally disconnected, so can take time for an individual to register the relationship. Physically pressing a button can be very difficult for the service-users and the switches are made of hard plastic materials, therefore uninteresting to touch.

Initial conclusions

My motivation for the MSE (sessions) was to gain an insight into the service-users preferences and interactions with the environment and equipment, with the idea that I would be able to draw conclusions from this, which I could then interpret into my practise. In hindsight, to assume that there could be a relationship between an individual's reactions and preferences according to their special condition is impossible and morally wrong. Universally, as individuals, we all have different behaviours, preferences and reactions despite any imbalance with our sensory processing. Therefore it would be impossible to create a universal textile structure that would cater for everyone's sensory needs and abilities.

During the second term I became very sidetracked with concerns of, how do I measure the service-users reaction to stimuli, especially if a person is non-verbal, how will I truly know what they are thinking and what their likes or dislikes are? Will my interpretation of their reactions be correct? Should I really be looking at scientific ways of measuring and assessing children/adults reactions to stimuli?

With all these questions racing around my head I found myself battling through books trying to understand sensory processing, the central nervous system and the methodologies Occupational Therapists use within case studies. My discovery was that many of the case studies are anecdotal and the range of measuring techniques I came across was very confusing.

These concerns were beginning to inhibit my design thought process and I was beginning to think maybe I should have completed a degree in occupational therapy before taking on this research...

Then during my presentation in February all of my questions and concerns were answered. I realised that actually as a designer I am taking on a different approach and stance to that of an occupational therapist. I will be making and designing textile structures which will appeal and at times not appeal to the service-user. It would be the responsibility of the parent/care worker who really knows and understands the person to decide whether my textiles are beneficial.

The observations I have made have guided my practise. Working with individuals with limited mobility has made me realise the importance of movement and interaction. Therefore my practise will be focused on tempting and encouraging people to move, play, touch and interact. Initially my research title had the word 'therapeutic' which I have since removed. I felt that I did not want to proclaim that my textiles would have therapeutic properties, but would take on board the original concept of the MSE, being a form of leisure, entertainment and enjoyment, which arguably can be a very important form of therapy. Leading to the question: Does enjoyment need to be measured scientifically?

MSE - Fieldtrips

Having only seen and experienced the MSE at FACT I felt it was important to visit and document other MSE's to enable me to make comparisons in terms of design and practise. I conducted interviews with the care worker/ teachers to explore their views. Even though through my own experience I can see the benefits and problems of the MSE, it was important for me to listen to other people's thoughts and feelings to expand and reinforce my own.

I soon realised that MSE's are not often advertised and can be found in a variety of establishments such as schools, residential homes and day care centres, so to locate them was quite difficult. Therefore, I contacted the Autistic Society who produced a list of establishments that housed an MSE. I limited myself to London and selected five establishments; a school for children with learning disabilities and behavioural difficulties, a school for autistic children, a day care centre for adults, a children's day care centre and a residential home. During these field trips I made the following observations:

- There were problems with the high-tech equipment; often it was not being used. Staff were not trained to use it and with a high staff turnover and use of agency staff there is no opportunity for training.
- On two occasions I noticed that some of the high-tech equipment was broken, for example in the Spa School the interactive light floor panels had cracked and had not been fixed for two months. This is because when something breaks they have to contact the manufacturer who will then send someone to fix the equipment, which can be difficult and lengthy process. The MSE in the Spa school is merely two years old, raising question with regards to the quality, which is something that needs to be addressed.
- One teacher mentioned that some of the children do not like the smell of the PVC (which is a material that it widely used, covering all of the soft play surfaces) and it also gets sweaty. Another complained that admittedly their MSE is extremely small, but with all the lighting and technology it gets very hot so often they have to open the door, which interferes and distracts the children in the sensory session.
- I discovered that the MSE's are being used in a variety of ways. Krisharon Day School uses it as a reward mechanism so once a child is awarded 5

gold stars for good behaviour they are allowed 10 minutes in the MSE. The teacher felt it really did relax the children who were particularly hyperactive or had behavioural difficulties. The Spa school programmes the MSE into the school timetable so that each child has at least two forty-minute sensory session a week. Lockhealth is a drop in centre where there could be from 2 to 8 adults in the MSE at any one time, for up to three hours. I noticed that some of the service-users were left on their own, as there is not enough staff to allow one-to-one facilitation. Kintore Way allows other schools in the local area to use their MSE for a small fee; they even hire out 'sensory suitcases' for parents to take home with them.

- Both the care workers and teachers appeared to have different methods and approaches to facilitating the sensory sessions. Often I walked in and all of the sensory equipment would be turned on with children running wild getting more hyperactive. In another the service-users were left on their own, staring up at the blank ceiling and entertaining themselves through self-stimulation.

MEDIATE

The project Mediate began in 2002 at the Centre for Responsive Environments at Portsmouth University. Mediate is a portable interactive and responsive environment for children with autism spectrum disorders, it represents an impressive virtual/digital environment driven by intelligent sensor-controlled technologies. My initial reaction to Mediate was excitement. Here is a project which is exploring new technologies, putting them to a really worthwhile cause to create an innovative, immersive and reactive environment for children with autism.

Whilst Mediate does not claim to replace the current MSE, they do both hold similar concepts and more importantly are challenging the MSE manufacturers in

terms of design and application of new technologies. I arranged a meeting with the Mediate team at Portsmouth University, which left me with many concerns and unanswered questions:

- Mediate requires a lot of space, it is so high-tech that it would need another room to house the technological equipment that makes it function. So it is questionable as to whether an establishment (especially schools and day care centres) would be able to physically provide the space and afford the equipment, power supply and regular maintenance.
- Visually Mediate is not an inviting environment, in fact quite alienating. All of the equipment is static and made of solid materials, involving large flat screens strapped to the sides of the walls, leaving a large empty space in the middle. It almost feels like you are walking into a giant TV. Due to the limited textures and materials there was no temptation to touch and interact therefore confining the stimulation to just vision.
- The child is to enter Mediate on his/her own accord without a facilitator, which I should imagine would be a little bit scary. Will the child be able to independently navigate around the space and know to go up to the wall and press it to realise it vibrates? What if the child has limited mobility? What if the child is non-verbal therefore unable to verbalise that he is scared, needs the toilet or wants to leave? Is the space too clever, beyond the mental comprehensions of a child, would it therefore not just confuse them?

With all these unanswered questions I was left feeling a little empty with the realisation and concern that yes, new technologies are exciting but there needs to be a balance between technology and the service-users needs and that textures and materials do play a vital role for encouraging motivation, interaction and stimulation of the senses.

APPENDIX 4A

Sensory Sessions, Key Observations and Design Considerations:

Observation	Problem	Design outcome
<p>Individuals experience the environment from a variety of bodily positions, perspectives and angles. The gaze, angle and position of the head is often focused on the floor or ceiling, particularly for wheelchair users and for the service-users whose mobility is limited.</p>	<p>Apart from when the disco ball and projectors are in action the ceiling and often the walls are neglected spaces that are left blank.</p>	<p>Employ a total- design approach; utilize the whole space of the environment eliminating the division between the walls, ceiling and floor, melting them together so they are of equal importance for potential stimulation.</p>
Observation	Problem	Design outcome
<p>The service-users respond positively to the sensory props, which are flexible, move and hold a variety of textures and shapes such as, the fibre optic ponytails and the fire blanket.</p> <p>These props hold flexible, fluid and malleable qualities, which can be</p>	<p>Many of the sensory props are bound to the sides of the walls or fixed in one place, such as the bubble tube. The position and static nature of these props are often impractical for the service-users with limited mobility.</p> <p>Many of the props are made of hard materials such as plastic and wood,</p>	<p>Design props that are mobile, flexible and rich in textures, it is important that the prop is accessible to everyone and can offer a variety of interactions, which are not solely restricted to just one part of the body.</p> <p>Experiment with materials moving away from plastics and wood.</p>

<p>explored through the whole of the body, encouraging the individual to stretch, reach, manipulate and wrap the prop around the arms, fingers, legs, head and feet.</p> <p>These props offer a variety of interactions, which are not solely restricted to just one part of the body.</p>	<p>which lack variety in texture and limit the range of interaction.</p>	
<p>Observation</p>	<p>Problem</p>	<p>Design outcome</p>
<p>The degree of interaction often depended on the sensory feedback of the prop. The service-users responded and were motivated by the props which moved and which they could independently move and interact with.</p> <p>As many of the service-users are confined to a wheelchair for the majority of their day, it is important to encourage interaction and movement, no matter how subtle it may be.</p>	<p>The switch-operated technological equipment offers the single sensory stimulation of sight. Many of the props are static and do not move.</p>	<p>Design props that stimulate more than one sensory modality, such as touch and sound. Develop props that have interesting behaviours and movements that encourage the individual to move.</p>

Observation	Problem	Design outcome
<p>The service-users attention span can be very limited so it is important that the sensory props have an instant reaction and response to the service-users movements.</p> <p>The vibrating props were extremely effective as the individual can feel the instant sensation of the vibration, together with the waterbed, which reacts instantly to subtle and big movements of the body.</p>	<p>The switch-operated equipment can be quite confusing for the individual. Though the action of the finger on the switch is triggering the prop to change, the response can be too instant, the switch eliminates the process of how that change is being created.</p> <p>Touch and interaction is limited to the finger on the switch therefore does the service-user really 'feel' that their action is operating the equipment?</p> <p>There is a very limited range of vibration props, in the sensory bus a service-user enjoyed the sensation of vibrations on his head and would use a vibrating teddy bear. This was the only vibrating prop available, which was not very age appropriate.</p>	<p>Explore the area of vibration and design props whose behaviours are dependent on the interaction of the participant.</p> <p>It is important to consider the process of how a prop changes, this process is an important part of the users experience and encourages exploration.</p>
Observation	Problem	Design outcome
<p>The switch-operated equipment limited the range of movements and was often beyond the service-users mental capabilities, particularly for</p>	<p>There is a limited range of simple props, variety is important as it will then generate new experiences for the service-user.</p>	<p>The simple nature of texture, form and shape is the key ingredients to a sensory prop, an imminent range of textures, forms and shape can be achieved therefore a diverse range of props</p>

<p>those at a sensorimotor stage of development.</p> <p>The simple props proved to be successful, their interesting textures and forms was enough to intrigue the service-user.</p>	<p>There can be confusion with the high-tech props, as they have switches, which require an individual to press in order to activate the prop, which could be positioned at the other end of the room. Therefore the switch and the prop can at times look totally disconnected, so can take time for an individual to register the relationship.</p> <p>Physically pressing a button can be very difficult for the service-users and the switches are made of hard plastic materials, therefore uninteresting to touch.</p>	<p>can be developed.</p>
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OBSERVATIONS: Bubble tube

TIME SPENT	FACIAL EXPRESSION	BODY CONTACT	TYPE OF MOVEMENT
0 min	Happy	Hand & eye Coordination	Non
0-30 sec	Sad	Eye Tracking	Push/pull
30-1 min	Scared	Hands & Fingers	Stroke
1-2 min	Confused	Face	Bounce
2-3 min	Excited	Legs	Jump
3-4 min	Blank	Toes	Twist
4-5 min	Bored	Mouth	Stretch
Other 17 min	Other Transfixed into the bubbles & light	Other	Other child not more

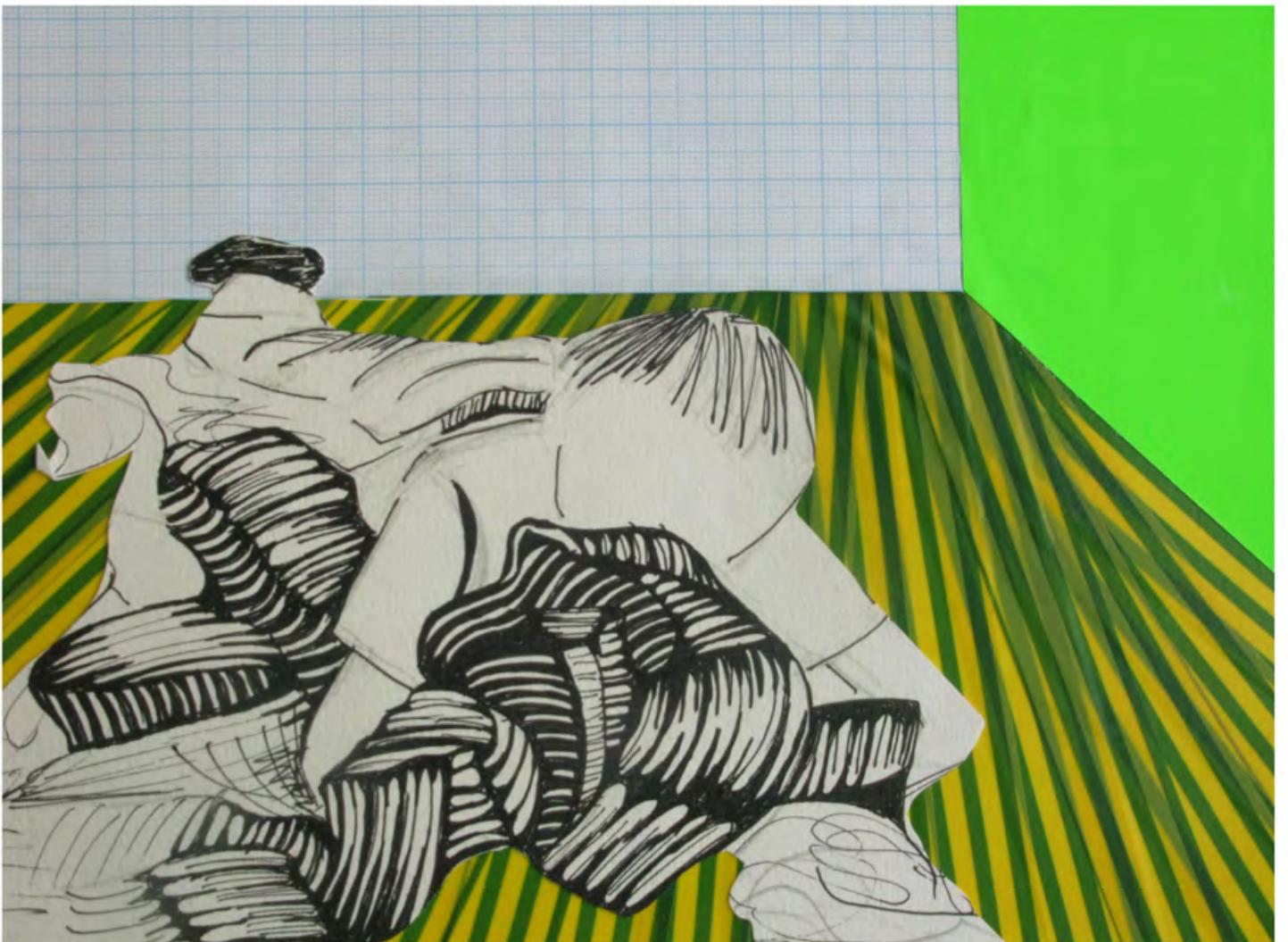
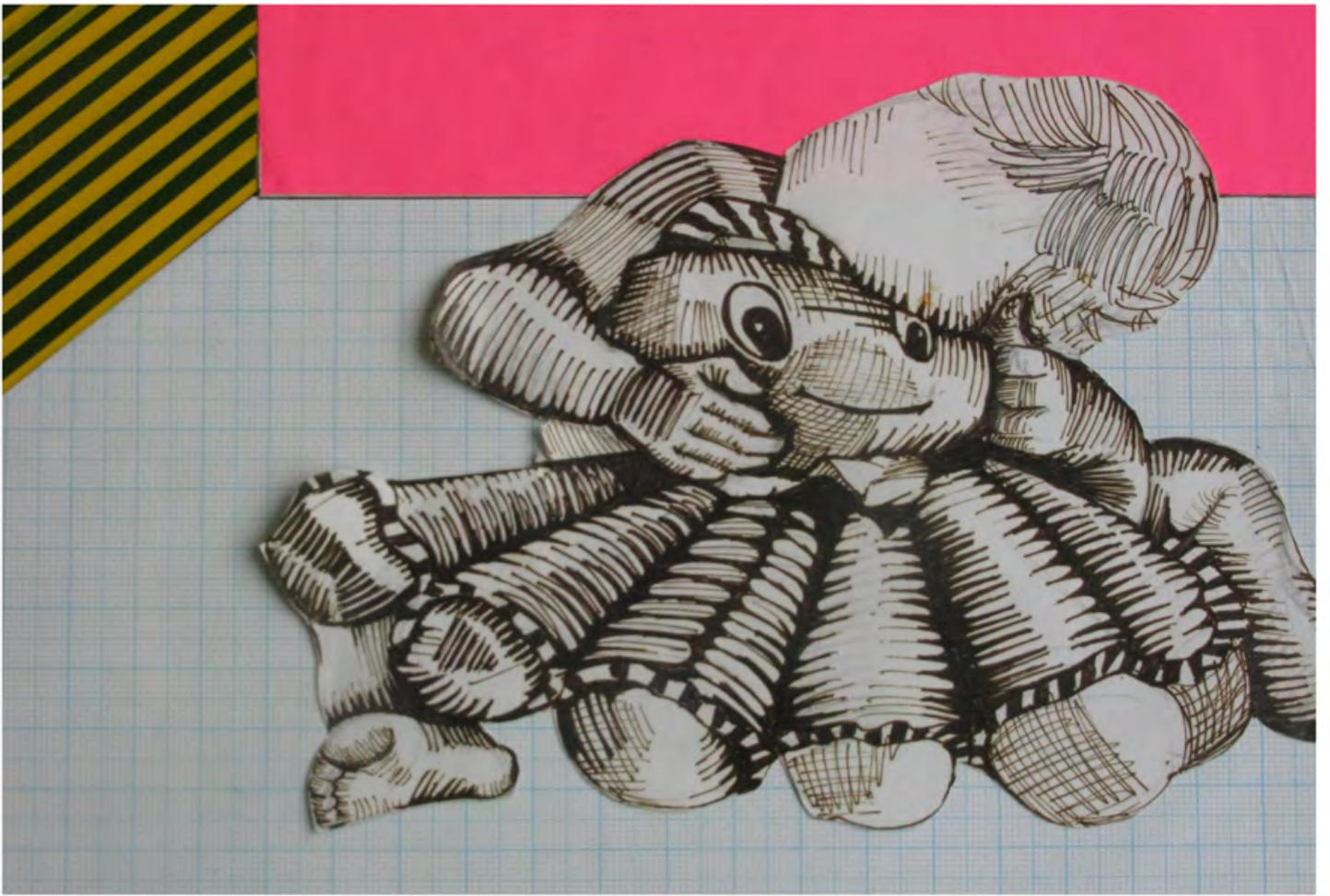
VERBAL/NON-VERBAL COMMUNICATION		REPEATED PLAY?	
Blinking		DESIGN PROBLEMS	MO was so transfixed it was difficult to introduce him to other props -
Talking		PROBLEMS AND DIFFICULTIES?	The bubble tube did not encourage MO to move
Moaning		INDEPENDENT PLAY?	Yes - but maybe too much. There was limited opportunity to interact because MO could not take his eyes away from the tube
Screaming		PRACTITIONERS COMMENTS	For the rest of session I may introduce different materials (transparent) and see what they feel and look like against the bubble tube
Shouting			
With Practitioner			This might encourage MO to move and interact with the bubble tube with his body other than his eyes
With prop			
Other	NON		

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Appendix 4C Observational Drawings Figs. 1-12

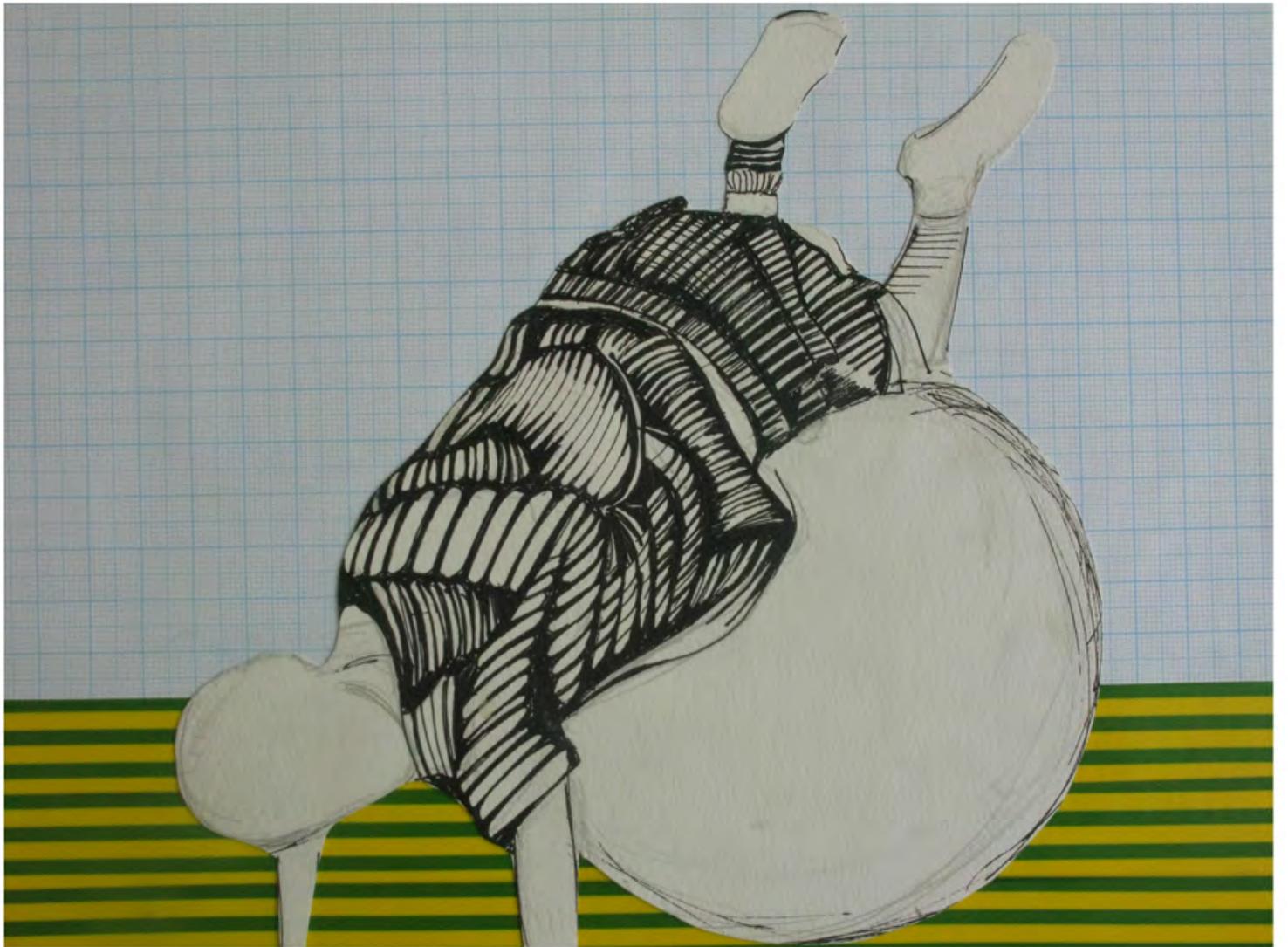












Appendix 5 Figs. 1-11

Observational Sketches: Occupational Textiles







Appendix 6A

Dr. Lesley Collier, Occupational Therapist

Southampton University

19th October 2009, 9.57am

I started by working as an Occupational Therapist in Bournemouth, working with adults with dementia. I have always been more interested with severe dementia rather than the early stages. I have always been challenged about how you get to them, how you get through them and engage them in any activity considering their level of function.

I had been working on a continuing care ward and I had been trying to think of a way I could get through to these men with very challenging behaviours, when all the other techniques I knew about didn't seem to work. I heard about multi-sensory environments. Then the psychology assistant, Paul Barber and myself heard about this room, which was in a children's unit in Poole. So we took one of our residents over to this children's unit and it was one of the very early snoezelen rooms with the foam all over the floor, padding up the walls and all white.

We took him in there and it instantly disabled him because he couldn't balance on the foam floor but what we noticed was how he wandered around picked up things and looked at them, interacted with them. There were smiles he was vocalising but they were happy sounds rather than aggressive angry sounds and we stood back and watched. We came back and he just seemed so different after that experience, he was looking out of the window and taking note of what was going passed. So we drove back in the car and the nursing staff also commented that he was a lot calmer when he got back. So we thought something obviously was happening here so we approached ROMPA who made and built the room for this particular unit. We said to them, tell you what if you give us the equipment we will research it for you. So they gave us the equipment and that was when we did our first piece of research with it and started to realise it had huge potential.

We adapted the MSE slightly because we could see from the children's unit, it was set up for children and unsuitable for adults, we didn't have any foam on the floor, we did have a small foam area so if people wanted to sit on the floor then they could. But we needed to be able to get wheelchairs in, walking frames, sticks people unsteady on their feet. We didn't go for the white room just painted sort of magnolia cream colour because again we wanted it to be fairly familiar. We didn't want to scare people going into the room for the first time and we used curtains, black out curtains rather than black out blinds because again it was more familiar.

Has the design of the MSE changed and is it changing for the better?

Well I think one of the reasons Snoezelens or multi-sensory rooms have had bad press is because people seem to think you switch things on and you take somebody into the room and leave them there for 20 minutes 'til cooked and something miraculous will have happened. It was very clear to me as an occupational therapist and to Paul who is a psychologist, that whilst we saw positive changes in this individual it had to be about the way we interacted with him too. So I tend to view the equipment purely as a toolbox and in your toolbox you need something to stimulate sight, sound, touch, smell, taste and movement. When I am talking about movement I am talking about proprioception so you know where your body is in space and vestibular stimulation.

Now those last two bits about movement are connected to theories of sensory integration where we learn to move, generally the way we move our bodies and interact with our environments. So I only ever saw it as a toolbox and I think if you think of it as a toolbox and choose the equipment to the individual then you won't go too far wrong. I think my fear is that there still is an element that you have to have all this equipment, expensive equipment and somehow something will happen to somebody and it doesn't work like that.

Is design important for the MSE?

I think its essential, I think that's one area where they are going wrong with the room the fact that they only focus on sight because what if you are not sight orientated and all of us orientate through different senses, some of us may orientate tactile orientation. I think its essential to use everyday things as well as the whizzy special stuff and also the other thing that I noticed was that with my latter piece of research is that when people came out of the room they seemed to be able to be more focused, but you need to be able to supplement the work that goes on in the snoezelen room to what goes on outside. So I always encourage people to think about Snoezelen in their environment and thinking about the sensory qualities of just everywhere we are. So that might be something as simple as the covers people have on the arms of chairs but maybe different textures so that it is not always the same. So if you have got somebody who is in a wheelchair a lot of the time they've got different textures. I often see people with dementia fiddling with petticoat and the lace bits of thread and things like that so people seek out stimulation when they are not in the Snoezelen room, so it's about enriching everything.

There tends to be an opinion that the MSE is too far removed from reality, what do you think about that?

I wonder whether they would say that if they had started off with the normal population? Just thinking about the things you do on a spa day, go into a darkened room, massages, we accept those as being some thing that we choose to do when we are feeling stressed. I know a couple of spa places that actually have a sensory room, now if it had started off with the general public would you still get that same argument if it went across to disabilities, I don't know.

Is the MSE of therapeutic value?

I sit in an extraordinary position here because occupational therapists use everyday activity therapeutically, so to me washing a dressing is a therapeutic activity because if I've got someone with a stroke and I'm teaching them how to redo it again. Learning a skill, but its something you do everyday. So I

struggle with the concept that there's some things that we don't do, I think the whole act of doing is therapeutic for us. If you put somebody into a room and don't allow them to do any of the things that we normally do, they become sensory deprived and deteriorate so the 'doing' of everyday tasks that keeps us going that's our reason for living, getting up, cooking breakfast, washing dressing going to work. They are things that we do that keep us stimulated to keep us interested and give us a sense of purpose, so that's therapeutic. So I struggle with this concept about what is therapeutic and what's leisure because actually I think leisure is therapeutic because if you didn't have leisure you would end up really stressed.

How important is it that we measure the benefits of the MSE?

As the measuring bit goes that's really about proving how good it is, and I agree with you essentially you shouldn't have to measure it and maybe you don't always have to measure it, but you need to be able to prove it works. Because we are putting these rooms into institutions that really can't afford throwing money at something that is not of benefit. So we need to be able to say with certainty that yes it does make a difference and once we have done that then that's ok.

How you measure, again I think you have to remember that the Snoezelen is a tool box so it's not the equipment per say that makes a difference it's the way that you use it. So you could have an optic fibre or a sensory prop that you've designed and it can sit in the room and somebody might interact with it but you could never really tell what purpose it was for until you know what you are trying to achieve beforehand.

What I was saying to you right at the beginning, a lot of time I've spend has been looking at what does a sensory room does to us? Why would something happen? Why would a change occur? I did a lot of work on what we would call sensory processing which is what we call when we take in sensory stimulus make sense of it and react on it. And what I did discover is that people have different processing abilities. So you've got people a bit like the sensory seekers and thrill seekers of this world who love going to Alton towers on these huge great rides, which would scare me rigid. But if you put those kinds

of people in a Snoezelen room with one piece of equipment they would be bored rigid because its not sufficient stimulus to reach their threshold.

Now the other kind of person is a sensory avoider and they are the people, strict routine people, they like what they like they don't like eating foreign food if they are not quite sure what it is. If there is something on their plate they are unfamiliar with they will always sniff it first or prod it with their fork. They like routine because with routine they know what's going to happen and in fact can show you a graph with it so that you can see the different quadrants. So you have a sensory avoider and if actually you put them in a room with everything switched on they would just be totally overwhelmed by it and run from the room screaming. So it's not about the equipment per say it's about the person and how you set up the room for that individual.

Do you have any suggestions or advice for designers who want to design sensory props for the MSE? Can you explain to me Winnie Dunns Model of sensory profiling and this may be of benefit for a designer?

What I would suggest you do is that you choose to stimulate something in a certain way, and you consider people in this grid, so you adapt the piece of equipment your prop so you've got something that gives you very subtle stimulation right through to something that is very blatant. And then you can test them amongst people in a certain group. So this is Dunn's model of sensory profiling processing by a lady called Winnie Dunn. At the left hand side you've got this threshold of reactions so if you think about yourself, just for a minute, if somebody speaks really quietly to you may not notice they are talking to you so your threshold hasn't been reached. If somebody yells at you or the fire alarm goes off that hits the threshold very quickly. So it's a point at which your threshold is reached at the point of which you react. Some people have a very low threshold so they react quicker so they are the people who do not need a lot of stimulation to notice things. They hear things that a lot of other people with a low threshold would miss. They respond quite quickly whereas somebody with a high threshold takes a long time before they react and needs a lot of stimulus for them to react, a bit like me first thing in the

morning. I need a lot of stimulation before I can respond. At the top you've got their behavioural strategies that they use to manage the threshold that they are at. If you are passive you don't do anything about it, if you are active you work to either seek out stimulation or to control it. So then you've got these quadrants, and this is where I'm thinking that maybe you could think about the individuals in these quadrants, so for example if we start at the high threshold to start with:

Somebody who needs a lot of stimulation before they respond but if they are passive behaviour they fall within the low registration quadrant so they don't notice things going on in everyday life, they miss things, they leave things behind, they don't get jokes quickly, I'm a little bit of a low registration person. I mean when I was writing my PHD I had my two children at home and there would be fighting out in the hallway and I could be totally oblivious to it I could just concentrate it just didn't reach my threshold. So very often people who are passive low registration people look like swans they drift through life as though nothing phases them and actually they are probably missing quite a lot too.

Then you've got the person who has a high threshold but actually needs to get out there and seek it. So this kind of person is your thrill seeker, spicy foods, when they are sat there is always a foot going, if there is a pen and you start talking to them they will fiddle with the pen and you've probably seen people like that a work. They are on the go all the time, now if you designed a piece of equipment for these two people they would have to be in your face blatantly stimulating really stimulating. If its passive they are not going to go out and seek it you need to be a bit more clever about the way you do it...so things on chairs so then actually its there they don't have to go and look for it.

So thinking about stuff like that might be good, building it into everyday products that people might use. Whereas to somebody who is a sensory seeker they are going to go out there and get it so you can be as novel as you want and create as much as you want in that kind of environment. People in the low threshold are slightly different so you've got the sensory sensitivity people who they notice stimulation really quickly and get really irritated by it

so they don't like heights, they don't like labels in their clothes, they don't like certain textures of foods. Then you've got the sensory avoider who is someone that doesn't or actively go out of their way to do something about it as they are people who like a routine.

So If you designed these props to fall in these quadrants and then people can access before they go into the room, you could set the room up to meet the sensory needs of that individual where you're more likely to get a success.

Is the MSE growing popularity?

It is, I think the thing that will increase its popularity will be the research because we are in a market where you are supposed to use evidence based techniques on the patients. There is a growing body of research out there, I don't know whether you have managed to seek it all out, that think if we can continue to produce robust studies to prove that it works then that thing will drive it forward.

Is it a problem that most research conducted on MSE's are anecdotal?

It is and the trouble with that is if you look at the hierarchy of acceptable research you've got the randomised controlled trials (RCT) at the top, and then you've got the qualitative stuff that is further down. Our medical industry looks at randomised controlled trials as gold standard, so you can be as pompous as you want about well you know we should be doing single case designs and should be doing this, but the bottom line is that if you want people from the department of health to put money up for this kind of thing, then you are going to have to do RCTs. Which is what I did, and you can do it, we shouldn't be afraid of doing that.

Why do you think its not being done more?

Well because its quite a new technique and you have to start off with these little observational designs, single case designs to test whether its worth doing for an RCT, because an RCT is expensive so you have to do this preliminary exploratory stuff first to see whether you have got any thing to research in the first place.

Are you the first person to do an RCT on the sensory room?

As Robust, even so it was challenging and I can see holes in it even. So I made it as robust as I possibly could to get some results and got some really really positive results. To show the kind of things that really stands out.

Is there a relationship between the concept of sensory integration and the MSE?

Ok well a sensory room is just a tool, it is just something that we would use. Sensory integration is an approach that you would use, it is a technique, slightly different and what I was going to show you is another little graph that might help.

So in our toolbox in the sensory room we have equipment that will stimulate sight, sound, touch taste, smell, taste and movement. And we may use that however we want, now sensory integration – Jean Ayres who is the woman who devised this approach. She suggested that children and adults who had clumsy behaviours or were very distracted or didn't like wearing clothes seemed to respond adversely to sensory experience, had problems with the way they were taking in sensory information.

Ayres would say they are not using the information appropriately coming in and the key sensory areas she looked at were vestibular, proprioceptive and tactile stimulation. All of which start developing before the babies even born, whereas things like smell and motion develop after the baby is born so if you don't get these senses working properly it can effect the way you do everything else.

Where does Sensory Integration Therapy take place?

It can take place in a special room, and the rooms have things like trampolines, mats hanging from the ceiling, so you can lie on it and it rocks so you can get purpose built rooms. If you go to Asia they have hundreds of these fantastic looking rooms, not so many in the UK because they cost so much money. A lot of that approach you can use everyday stuff, skateboards,

a lot of the Early Learning Centre do a lot of the equipment is just stuff that is out there. People who are pure integrative therapists will say snoezelen is not part of sensory integration, but there is no reason why you couldn't use a snoezelen room to encourage some of these things. So you can use them as part of your sensory integrative approach, I think if only if you look at the MSE as a tool it will be ok- in its own right.

How are occupational therapists trained about the MSE?

Our students are trained, I run a module course called sensory profiling and it includes the MSE.

I work as a consultant for ROMPA so if somebody buys equipment he might say to me could I go and do a training session with him or her so I will do that as part of my consultancy role with him or her. But most of the stuff and training is actually Asia based, Singapore, Shanghai and places like that.

MSE is taking off in Asia, it fits better with their eastern concept because they are very much about mind, spirit and body as it is harder here because we are such a medical model.

What do you think the future holds for the MSE?

If we get the research behind it, it has got a bright future, if we get too carried away with these fantastic light rooms it will die a death.

Appendix 6B

Philip Bath, Centre Manager for the charity FACT (Federation for Artistic and Creative Therapy, London,

16th November 2007, 10.49am

What are people's reactions to the MSE?

Initially most people are impressed with the room. You look at it and it's stimulating whether you have a learning disability or not. Most people judge it visually with out realising what you could achieve in the room.

A lot of people believe that you don't need that sort of environment to have a snoezelen experience. A lot of people think you should be outside to feed your senses, which is perfectly right you have got a great snoezelen environment out there, but I think you can balance the two and this is a safe environment for people to explore, be themselves, open up and achieve things which they may not achieve anywhere else.

How is the MSE used?

The room can be used passively or actively, the emphasis is much more on using an active room. When they first came about you didn't have switches or anything you would literally just go in with a nice smell coming from the diffuser, some nice sounds with the light on. So you would just sit in there and relax basically.

It is down to the facilitators to decide how to utilise the equipment. With some service-users I do think going in and just sitting down relaxing with no expectations of that person is a great way to use the room. But with some service-users this is not going to work because they need to be active so it's great that it can and should be used in both ways.

Is the MSE becoming technology led? What is your opinion of the sensory props and equipment?

When the idea first came around, they had a summer fair and decided to create a space for people with learning disabilities. So they had sheets and added liquid in and water projected onto white sheets and had sacks of rice and sand to put your hand in and smells. So the technology has evolved over years, it started with natural elements and now it's very technological. Personally I think the multi-sensory environments are much too full of plastic and crap, you should have some form of natural materials like wood, and everything is too plastic. You have the fibre optics but that again is plastic.

Rompa used to try out their equipment with people with learning difficulties and now they don't, so the main thing in a lot of it is about visual stimulation, but it goes so much deeper than that and they don't look into their designs properly enough. Like the switch on the bubble tube. You've got that big round thing which is quite hard to put anywhere also you have got your colour id's around the corner, and then you've got the orange button in the middle. So for me if you touch that orange button you are going to expect orange bubbles, but it doesn't it stops and starts the bubbles so that is really confusing. Because if you are going to do colour identification with the user they are going to think orange and actually that's not orange that's stop and start, so they should have either put a makaton symbol on it or left it plain.

With the new equipment its just too high tech even with some of the switches they just use the on and off. It has gone a bit technology mad and you don't really need all of that.

From your experience what do you think the benefits of the MSE are?

This is a great environment to build up relationships with people. I think with the people that we work with and their client base they don't get much chance of that. They are pushed around, told what to do, taken to a day centre, pushed in

front of the telly to watch Neighbours. Whereas here you have got a nice environment, its calm and you get time to build up on relationships and I truly believe especially with the adults slightly different in the way we work with the children, even though its relationship building, but certainly the 1 to1 with adults it is about them gaining confidence in you, getting to know you and build up that trust and all those things so it is very much a relationship building exercise rather than you just coming in and having a look at the bubble tubes.

It's a safe environment, I quite like the idea of the padding. I know sometimes that looks a bit institutionalised but I also think it safe and created a sort of warm environment if you like. I think the room should always be white rather than the coloured rooms or the black room, because I find them a bit too intense and the black room is a bit like you are in a nightclub. The black rooms are coming a bit more into play because UV is quite a big thing in the rooms as well.

It's an environment whereby people do things which they don't normally do and that might be just holding a fibre optic displaying some understanding of cause and effect, accessing a switch for the very first time giving you direct eye contact, all those things that you don't get the chance to do outside they get the chance to do in an environment like that.

Also there is no pressure, we don't go into the room as session facilitators with expectations I did originally start off with session plans thinking I'm going to do 10min bubble tubes, 10 mins with fibre optic, but you can't always do that because service-users are people as well and they have good days and bad days, mood changes just like we do. So for me to expect something of them I don't think that's right, you have to wait to see what sort of mood they are in that day and you build on that.

From my own experience especially with schools, it works well with adults but all the health and safety issues now that are coming into play. For example

Mohammed, all out training that we did in Germany they didn't like hoist and all things like that but it is all about letting that service-user roll around and have that experience of being pulled up the slope. I hate putting children in hoist I know its safe and all that but I just don't like them. I would rather lay them down on the sliding matt getting used to the floor.

Have you come across any difficulties with the equipment?

Some children are apprehensive when they look in the room because it's quite dark and so unsure about going in. One of the big things, which is a mistake on our part, is the fibre optic carpet in the entrance What I have noticed with a lot of the children, when they have a learning disability, it looks too dark and looks a bit like an infinity tunnel and even a couple of the adults will not stand on the carpet. Some kids are a bit overwhelmed with the environment, so what I do is just turn 1-2 things on and slowly introduce new things keep the curtain open and work your way in like that.

From your experience what sensory props are most effective?

A lot of the props that we used are not used for what they can actually do, it's more about a tool to reach out to that service-user, for example just because we have a shaker doesn't necessarily mean we are going to shake it. Like today I put the shaker on Dominic's hand. It's not about what the prop can do but us making the connection with that.

For me the prop that seems to be more noticeable in the room is the mirror ball because it covers the whole area, covers the floor, ceiling and walls so people notice more than other things, and respond positively and display awareness because they can actually see it.

Vibrations are very popular because it's an instant thing put it on your hand and you are going to feel something. If it's used in the right way introduced subtly engage child/adults results it can be used in a positive way.

For me I would keep the designs very basic and very simple, something that is not going to confuse somebody too much, something you get an instant result from. I.e. if you pick it up you get a sound or you can feel something or see something, so it doesn't take too much time for the service-user to work out, easy and simple to use. Starts off simple then you can progress and utilise it in another way with a service-user who may understand and achieve that little bit more.

Appendix 6C

Lillian Amdurer, Head Mistress at Krisharon Day School

London

13th November 2007

My sensory room was built more than a year ago now, only because there was a family who gave us some money towards it, because we are a charity we couldn't have possibly done it on our own. So it is a very small room and we are only a school of 18 children it's a room that 1 to 2 children can go in at a time. When you see the children experiencing all of the experiences in there its just heaven.

Are you happy with the design of your MSE?

There are still certain things that we are not completely happy with and we want them to come back and redesign and redo certain things, which are not working for us. I just wish I had a larger room because ventilation wise its not very good, if you start turning on too many of those electric lights and equipment then its gets very hot and you need to have the door closed in order to get the full effect.

We have also got a bubble tube and the bubble tubes needs to have the bubbles coming out in quite a rush, theses ones just trickle away so this needs to be taken care of. Otherwise we are happy with this room.

How does the MSE get used?

The room gets used every afternoon after lunchtime.

It's both relaxing and interactive depending on what you want to use it for. Sometimes we use it as a reward for children with poor behaviour. If they give you good behaviour you need to reward them in some way to encourage the good behaviour so it will happen again and gain. So if we know what ticks with this child is the sensory room then that will be the reward that they get and the

teacher will take the child in there for 5 minutes to relax. It could be used for educational purposes, i.e. shapes identifications of voices and sounds.

When the weather is bad and the children come inside the building it's almost like a box, so it's very difficult. How do you entertain them so we have got the gym and library music room and soft room and now a sensory room as well?

What inspired you to install an MSE into your school?

When I first joined the school 3 years ago one of the children was going to the sensory room at FACT (Federation for Artistic and Creative Therapy). Her parents were insisting that she had to go to FACT and so we then had to arrange for transportation on a weekly basis every Monday.

I actually went to FACT and I saw the MSE and I am thinking yes this is great, now I can see what can be provided for a child who really has poor sensory contact with the world and I was extremely impressed, so that started me off. So I got some information from FACT and information from other places that had sensory rooms and came to the conclusion that yes I wanted that facility, because we have 2 children who have very poor sensory contact with the world and the others of course will benefit.

It is an extra element to teaching isn't it if all your senses are alive. So I did my research and when I contacted the companies for prices and it came to £12,000, which was beyond my capacity, I can't do it. But we have a strong fundraising department so in about 7 to 8 months we had one donor who gave us the full amount.

Has the MSE made a difference?

The sensory room does make an impact, it's different from anything else it's quite a special warm corner. It's relaxing, it is seen as a reward and also the room that I have used was called the boring room until my time. So when I became head teacher, and I am to the school, I'm thinking I don't want a boring room in my school and that was the space that children went if they were naughty and needed timeout. That's the room they went to so I had to turn it around because

I'm thinking I can't have a boring room in the school I don't want children to think negatively of spaces, so I did actually manage to turn it completely around, now they want to go to that room.

Sonia Colvill, Teacher at the SPA School, London

19th November 2007

The school changed over from mixed needs to only autism specialism and the head teacher at the time decided that a soft play room would be very good for the students 4 years ago, sensory room possibly the same time.

Do the students enjoy the MSE?

Students either really like it or don't like it at all, they tend to be one or the other. The ones who don't like it is because they don't like the lights (quite a lot of lights in the sensory room) and they don't like interacting with anything. The majority of students like it though.

How is the MSE used?

Each class has a snoezelen session in the timetable and its usually 2 children to one adult. A session lasts for 40 minutes, which is the same as a class session. I find it relaxing when I go in with the children, they like the bubble machine, disco floor or infinity tunnel. They have a freedom of choice in the room, and take it easy.

Are you experiencing any problems with the MSE?

There are problems when things go wrong and you can't fix it, because of all the wires and things. So sometimes when something is broken it will stay broken for quite a long time. Anything that is too high tech for someone like me then you don't use it, because you don't know how it works.

Tina Jupp, Teacher at Kintore Way Children's Day Centre,
London

19th November 2007

Our MSE is coming up to a year old. We have other schools using the room, booking in sessions, and we also have sensory suitcases. What we are going to do is hire them out for other schools to use so more or less what's in here is what's in there.

We are very happy with the room, it's getting used all the time and even normal children are even coming down to use it, they find it fascinating. The children that don't suffer from Autism etc... they just think it's amazing

Every 6 weeks we have to make sure it's all maintained and everything is working. So far all the children I have worked with in the sensory room it has suited them down to the ground. The little boy that I am looking after at the moment won't get in that ball pit but he will hang around the bubble tube and hold onto that but won't get in the ball pit. Sometimes you have to try and work out for yourself what they like.

Appendix 7A

ROMPA: The Complete Resource

The company ROMPA® was formed over twenty years ago and contributed towards the design and develop of the UK's first Snoezelen® environment at Whittington Hall, Derbyshire (1987). As the MSE has continued to expand and grow so too has ROMPA, who is now the market leader in the design, manufacture and installation of multi-sensory environments.

ROMPA is the current owner of the Snoezelen® trademark and supplies over 8000 products to more than 600,000 customers¹ worldwide. With new developments in materials and technologies their product range continues to expand and diversify where this year their product range is presented over 270 pages in the 2010 catalogue.

With such a foothold in the MSE market I was interested to find out the average sensory value of their products, how much of their product range requires power or batteries and the types of materials that are being used to construct these products. I therefore designed a tally chart and listed every sensory prop with in twenty-four sections of the 2010 ROMPA catalogue, which made a total of 481 products. For each sensory prop I took note of their sensory value, which ROMPA has already illustrated using a symbol system (illustrated below), whether they required mains power or batteries and the material content of each prop.

¹ Romp, a sense of place (online) NHS 60TH Anniversary book, available from: <http://www.theconstructioncentre.co.uk/companies/rompa-ltd/1539/>

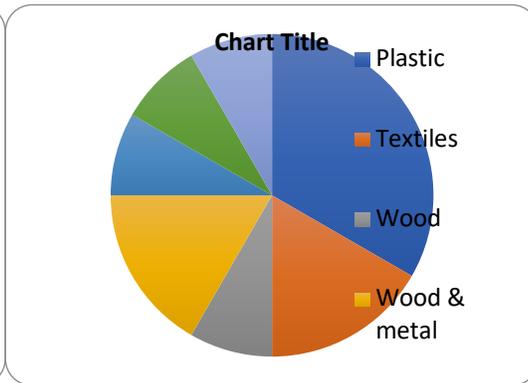
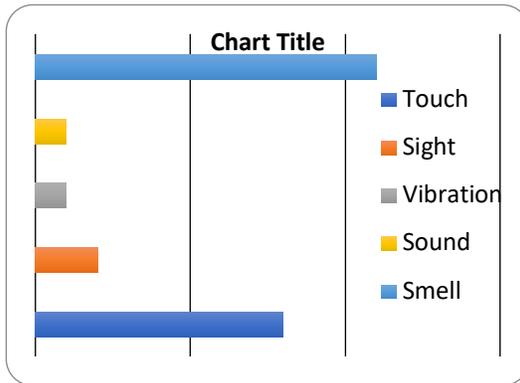
Appendix 7B

Product Analysis Chart: Catalogue Section: Stimulating Sensory Activities

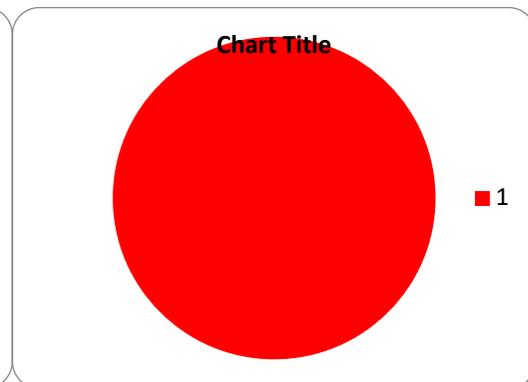
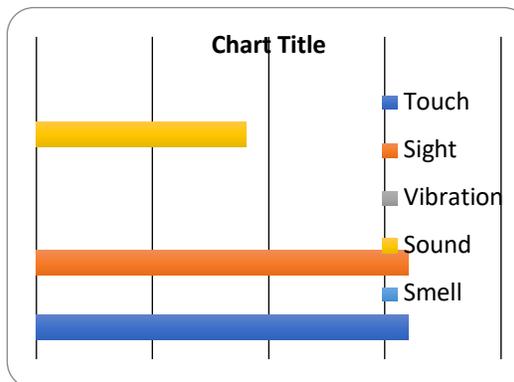
STIMULAING SENSORY ACTIVITIES									
Product name	Materials	Power supply	Battery	Touch	Sight	Vib	Sound	Smell	Low-tech
Activity board	Wood/plastic		X	X	X		X		
Activity centre	Wood/plastic		X	X	X		X		
Mirror diffraction activity centre	Wood/plastic		X		X		X		
Floor cog board	Wood				X				X
Quiet activity centre	Wood/plastic			X	X		X		X
Ultra violet tactile panel	Wood/plastic/Metal		X	X	X				
Be active box	Wood/plastic								X
Feely panel	Wood/plastic			X					X
Tactile panel	Wood/plastic			X					X
Midi tactile panel	Wood/plastic			X	X				X
Tastoletto	Wood			X	X				X
Tactidudo	Wood			X	X				X
Shape labyrinth	Wood			X	X				X
Perception panels	Wood/plastic/metal			X	X		X		X
Tactile sheet	Wood/plastic/textiles/rubber			X	X				X
Tactile totem	/sandpaper/Astroturf			X	X				X
3d awareness game	Wood			X	X				X
Tac-tiles	Wood/plastic			X	X				X

Sensation trail	Wood/plastic			X	X		X		X
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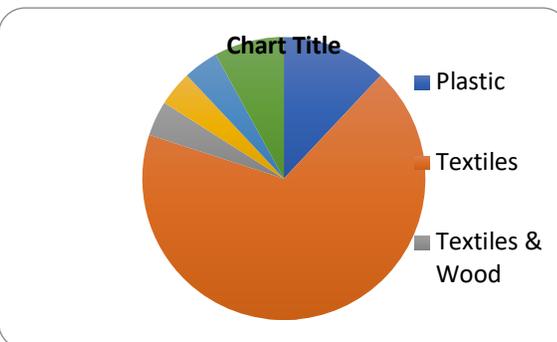
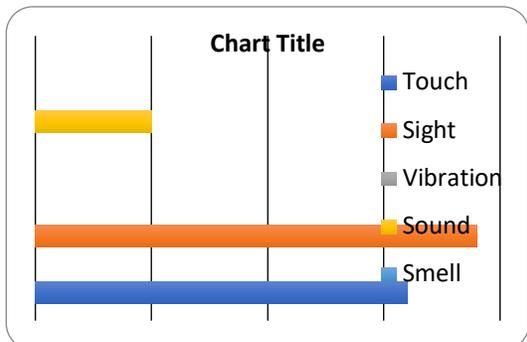
Aromatherapy



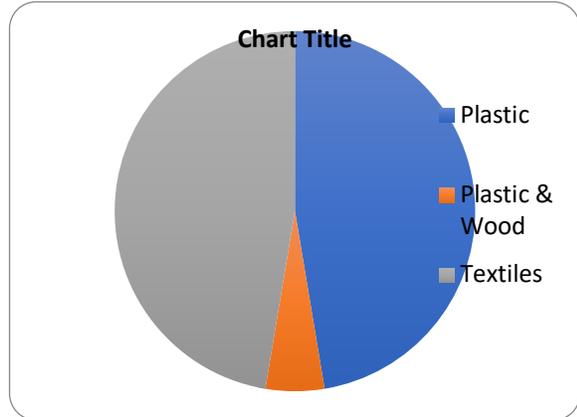
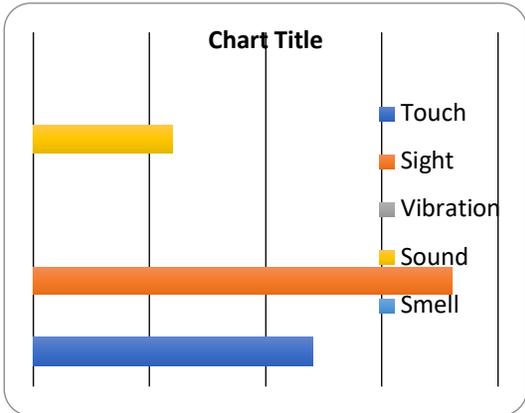
Developmental Activities



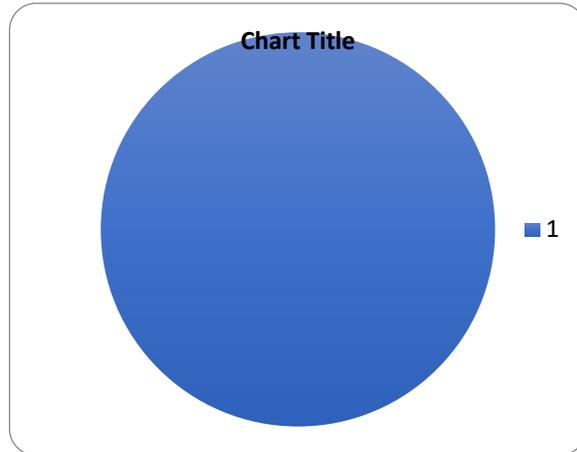
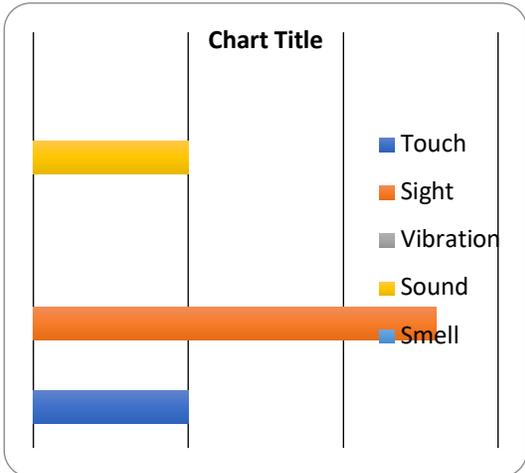
Early Learning



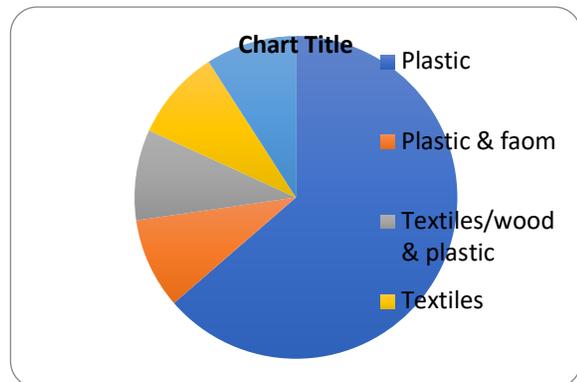
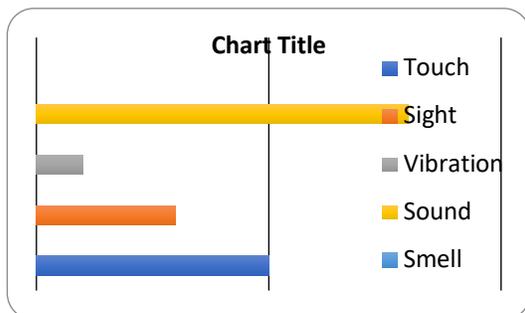
Glow in the Dark



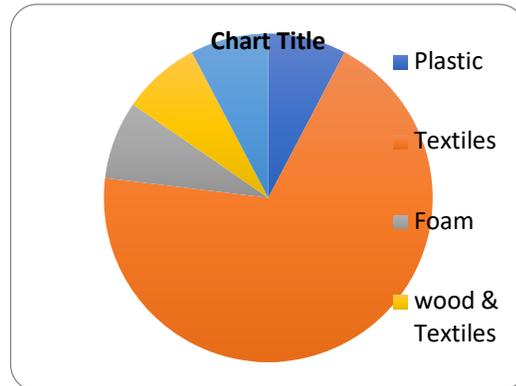
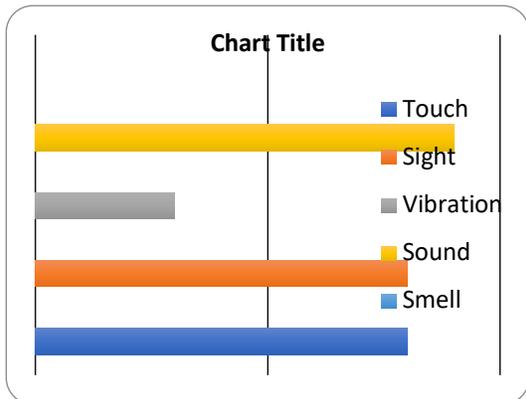
Interactive light



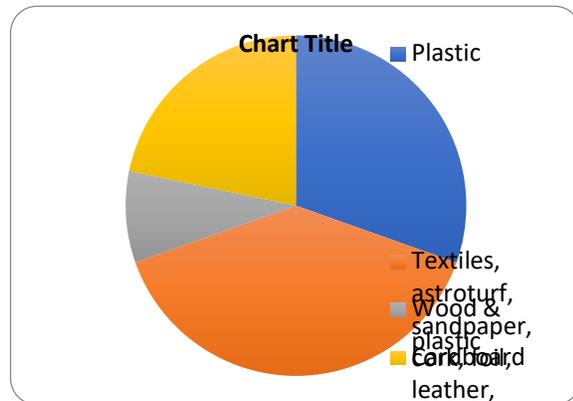
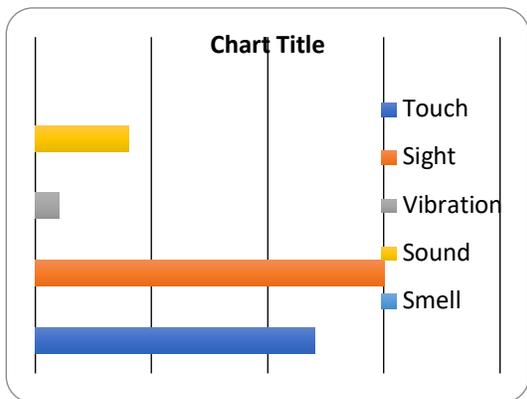
Massage and Vibration



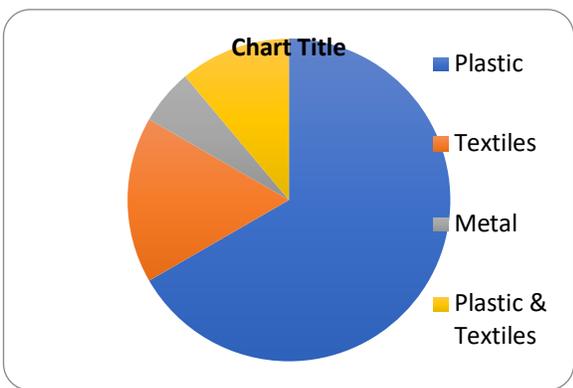
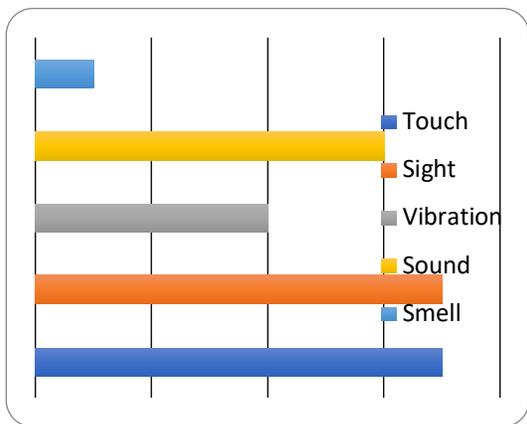
Matts and Movement



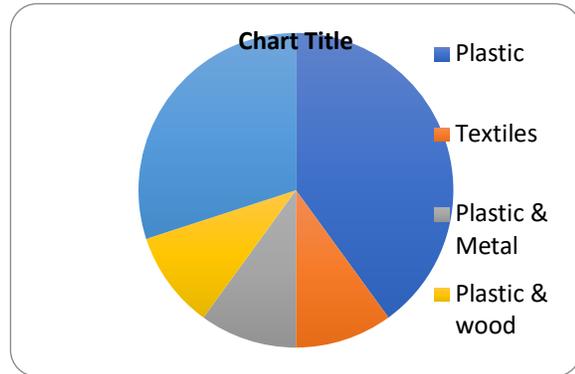
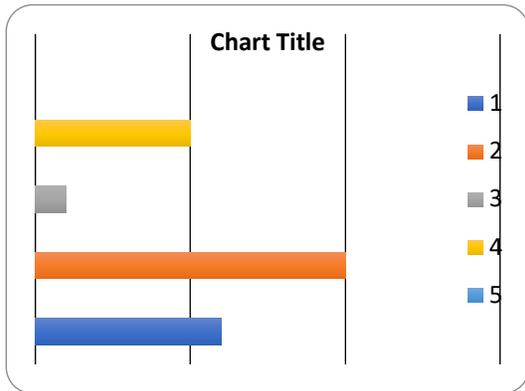
Older Adults



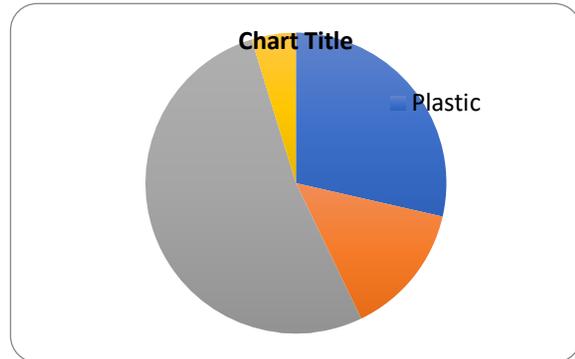
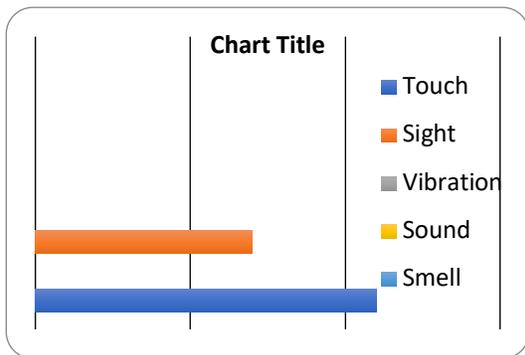
On the Move



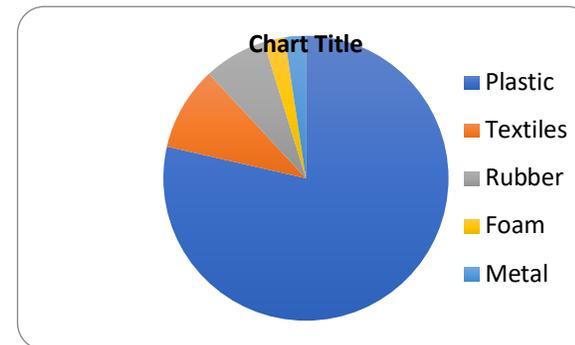
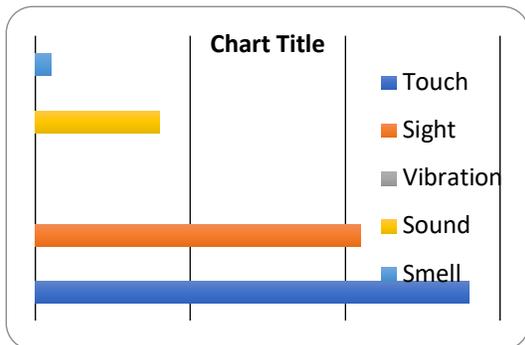
Puzzles, Push and Pull Alongs



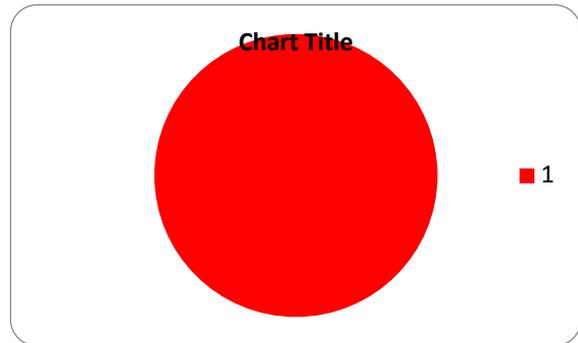
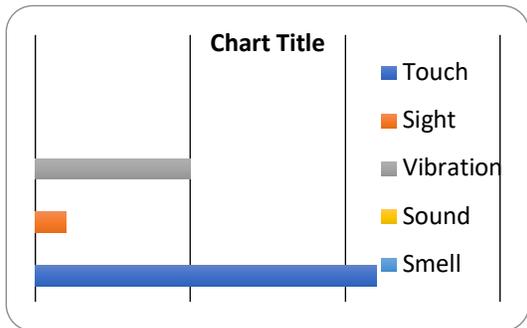
Seeing Through Touch



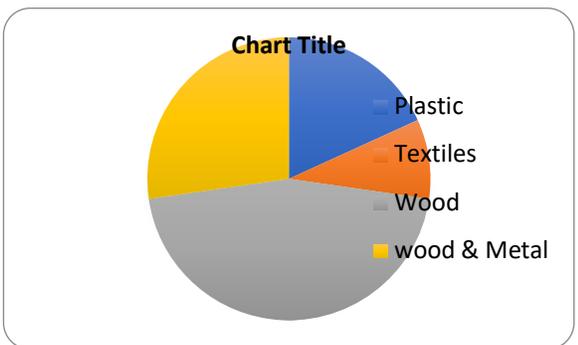
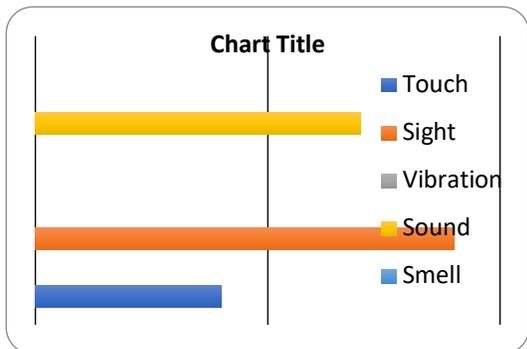
Sensory Balls



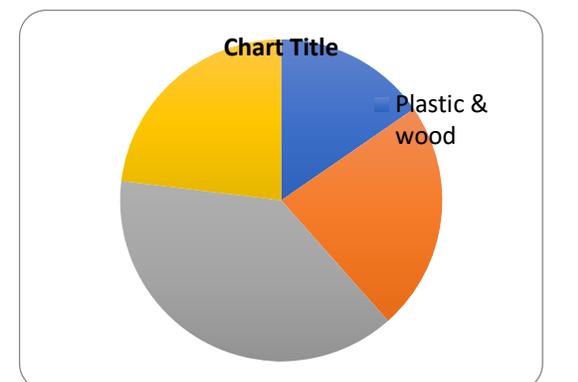
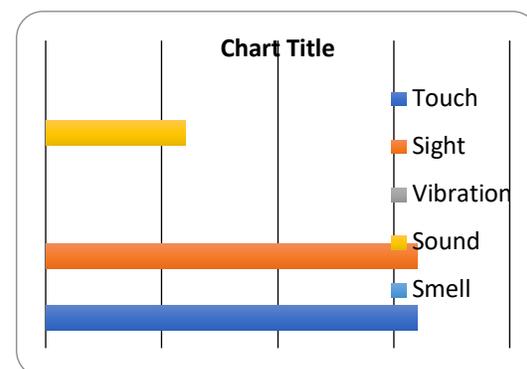
Soft and Sensory



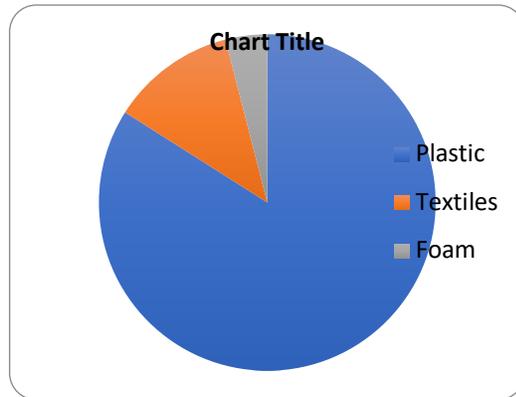
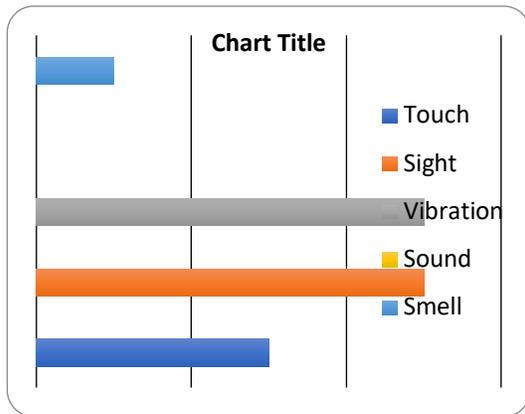
Sounds like Fun



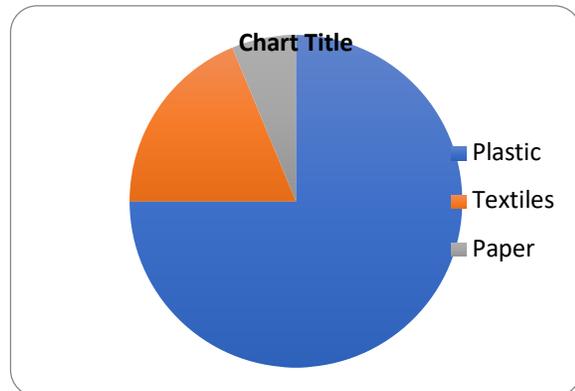
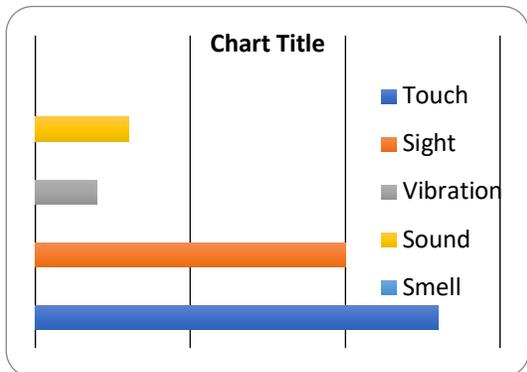
Stimulating Sensory Activities



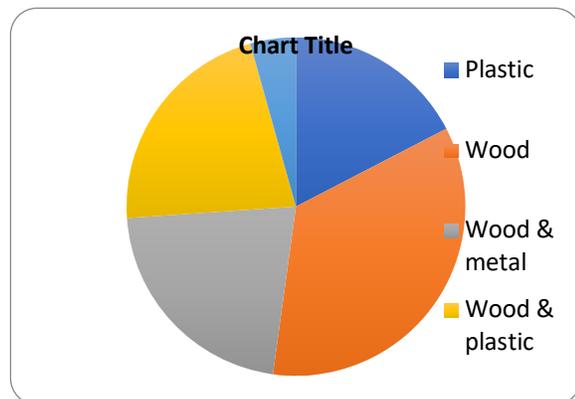
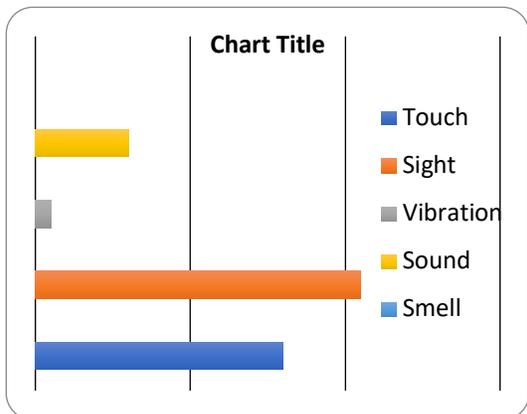
Switches



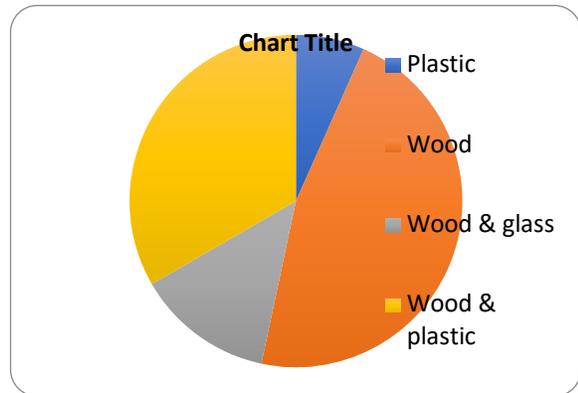
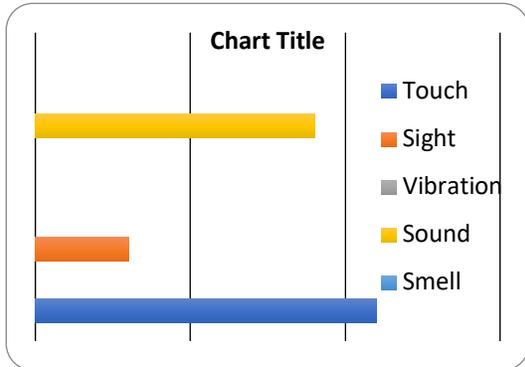
Touch and Feel Experience



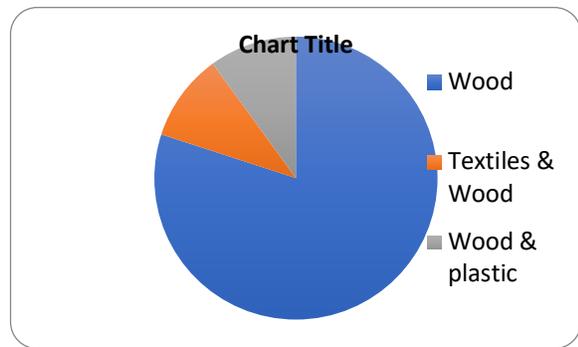
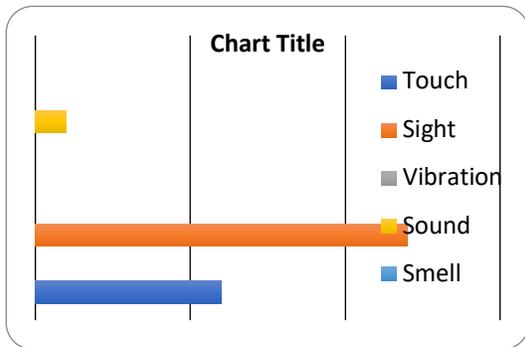
Tracking and Threading



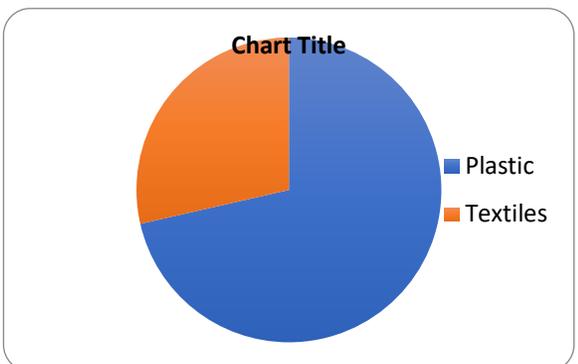
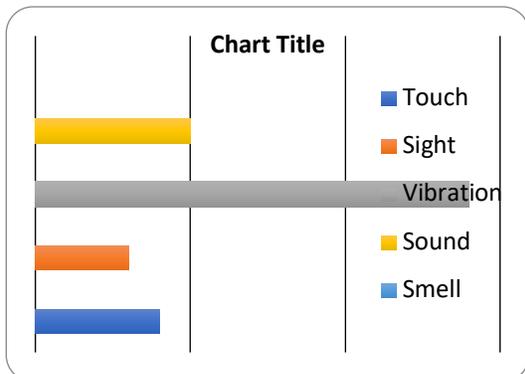
Turn, Flip and Roll



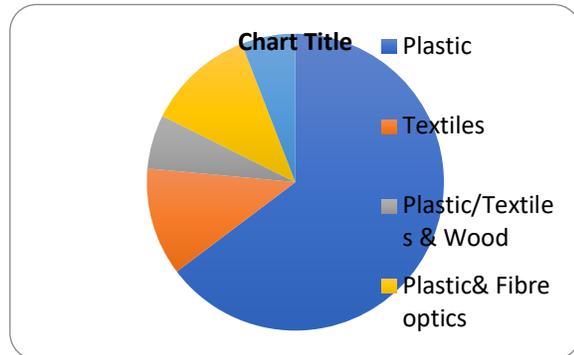
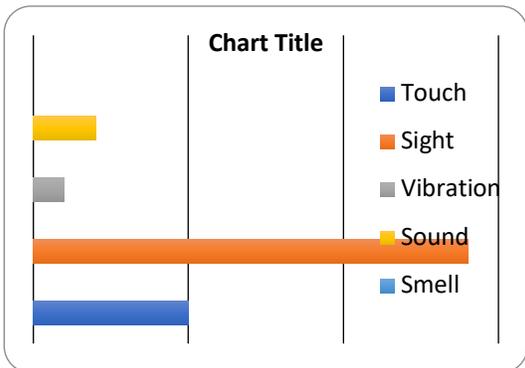
Twist, Turn and Touch



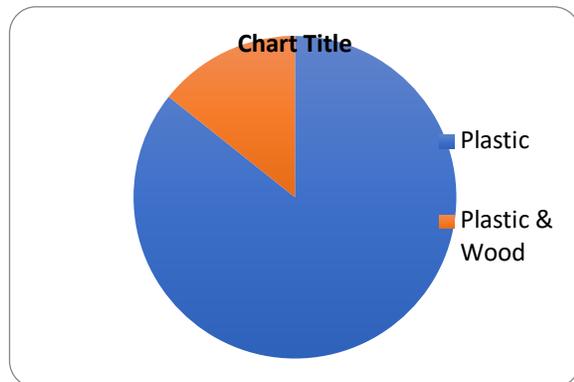
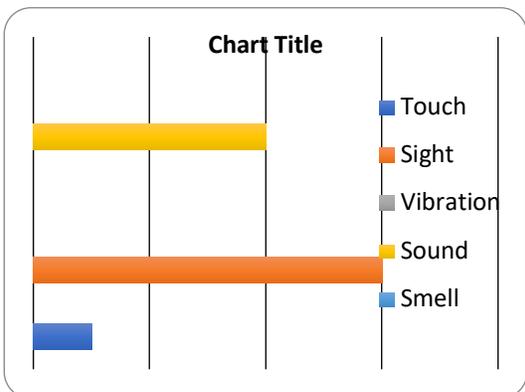
Vibration



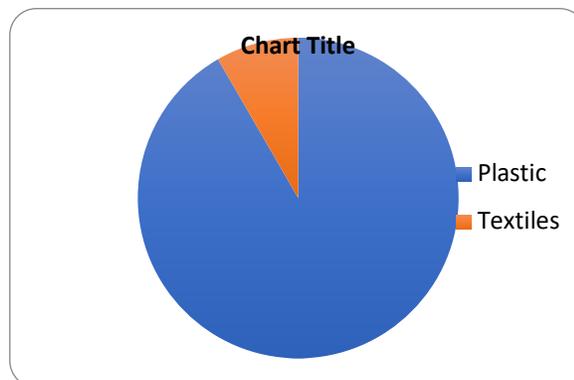
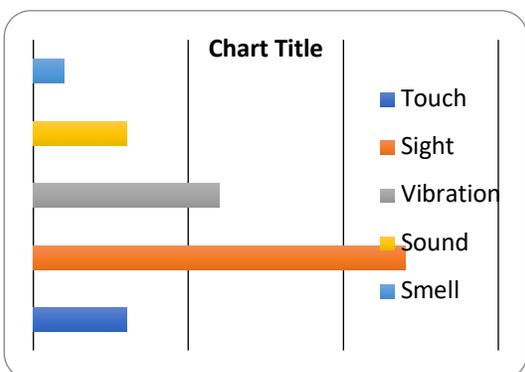
Visually Stimulating



Wall Panels



Wi Fi Products



Appendix 7E

Data Analysis

Materials?

When comparing the amount of plastic products against those that featured textile materials such as carpet, faux fur, nylon, knitted wool, 73% of the products were plastic based and 23% textiles.

Out of the 24 catalogue sections plastic featured highly in 14 of the sections, particularly those that involved mains power and batteries such as wi fi, interactive light and wall panels and 89% of the switches were made of plastic.

Textiles featured highly in the 5 sections whose products were aimed for young children and older adults who are at a sensorimotor stage of cognitive development. 100% of the products in two sections, soft and play and early learning were made of textiles and textiles featured highly in touch and feel experience, older adults, mats and movement and the developmental activities section.

Wood featured highly in the 5 sections that involved active touch and sound, such as sounds like fun, seeing through touch and turn, flip and roll.

Sensory Content?

The following percentages represent the over all sensory value of all 481 products in all 24 sections of the ROMPA catalogues; 40% sight, 36% touch, 6% vibration, 16% sound, 2% smell.

Though the stimulation of touch features highly alongside sight, it is important to bare in mind that almost ever product apart from the interactive light section can be said to stimulate touch. It is not just touch but the quality and haptic experience of touch that needs to be considered. As 60% of the products are made of plastic, 22% textiles, 13% wood it is highly likely that plastic is the

only haptic experience presented to many individuals. These figures also reveal that far more consideration needs to be given to the stimulation of sound and smell to create a truly multi-sensory product range.

Power Supply?

23% of the products require mains power, 18% batteries and 59% of the products are low-tech.

Though there is an 18% difference between the low-tech products with the mains and battery powered, it is important to consider that much of the low tech products involve small hand held props which are often stored in boxes to the side of the MSE. It is the mains powered props that tend to dominate the environment such as the bubble tube, projectors, fibre optics and interactive wall panels and simultaneously these products are in the catalogue sections where plastic is featured highly.

Conclusions

ROMPA clearly has a vast product range featuring a mixture of low-tech to high-tech and battery powered equipment does overall address the primary senses of touch, sound, sight and smell.

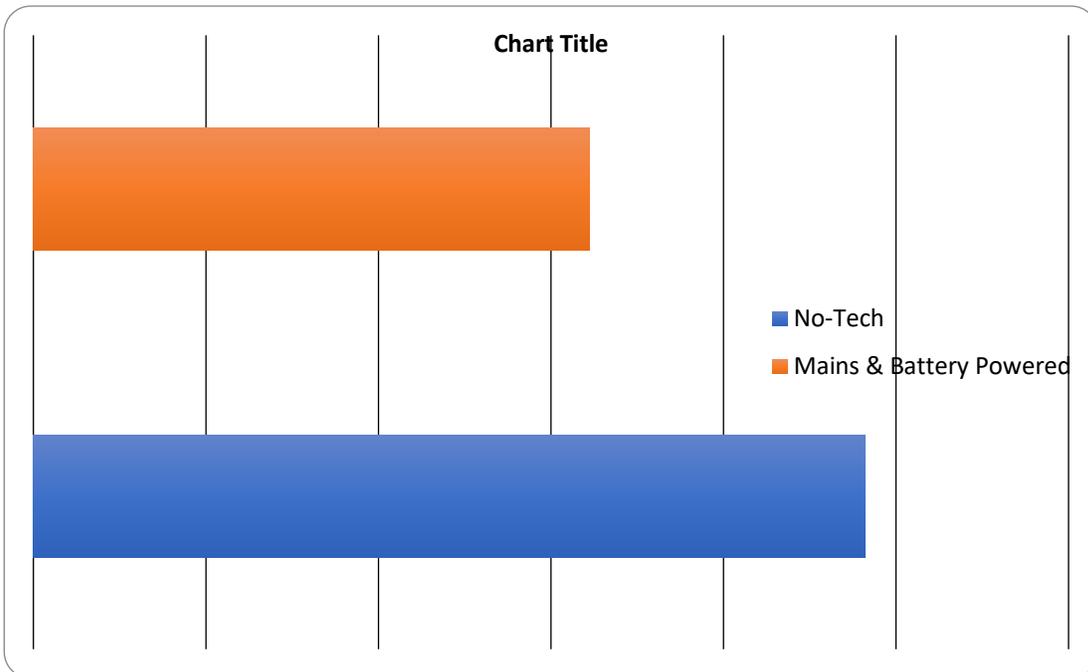
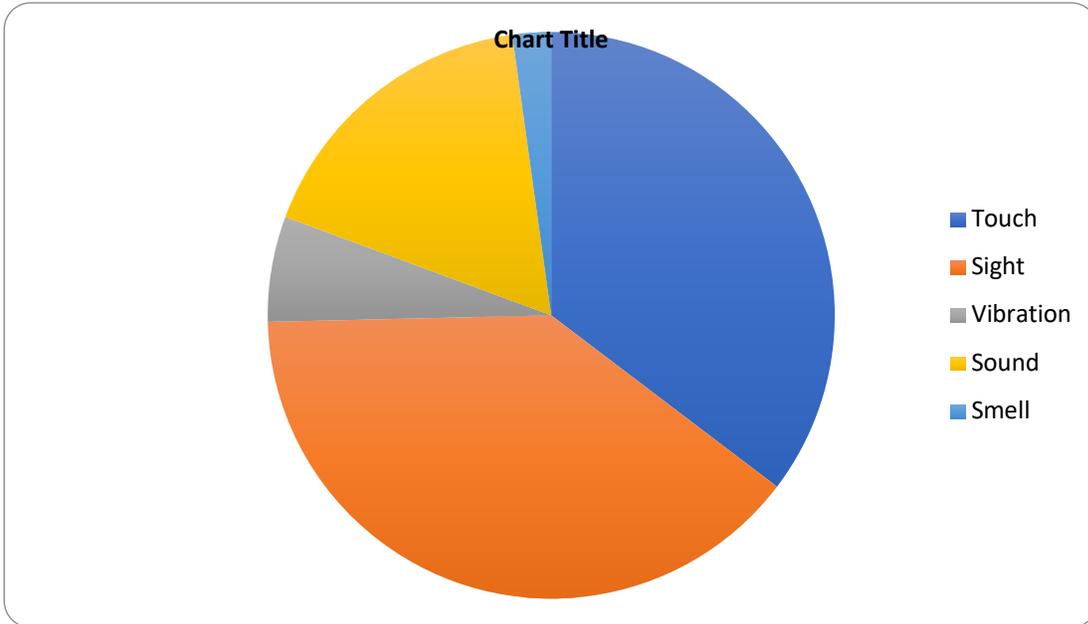
Yet, when we start to look closely at each individual product the results reveal that the products lack diversity in materials, where plastic is featured highly. More thought needs to be given to the material quality of the products this will create a diverse range of haptic experiences and may simultaneously stimulate the sense of smell and sound.

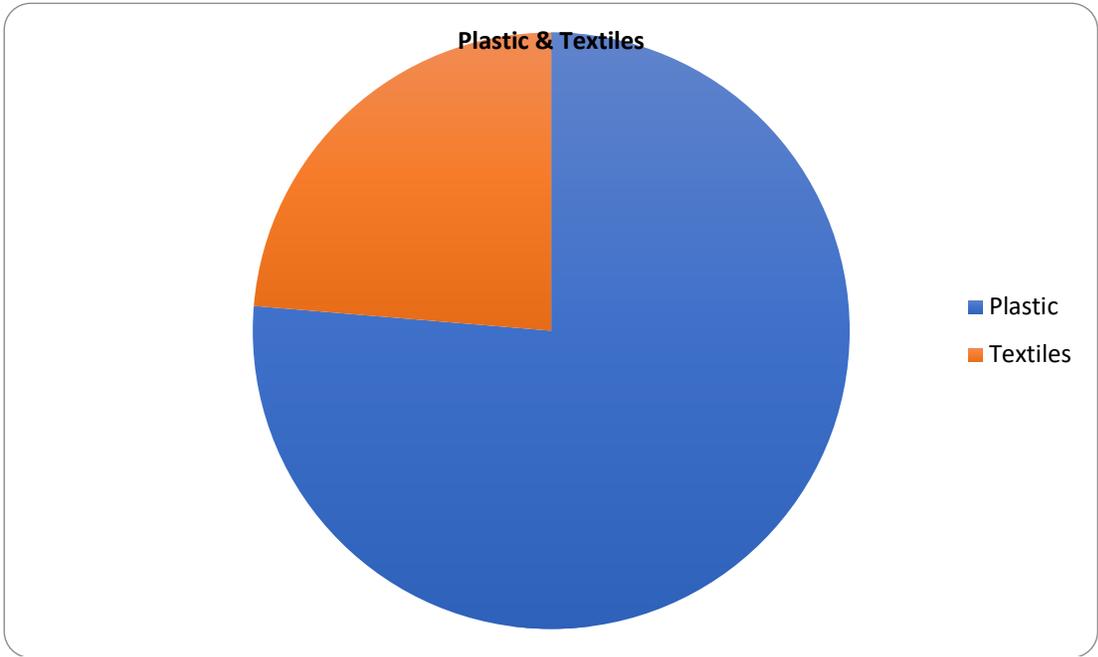
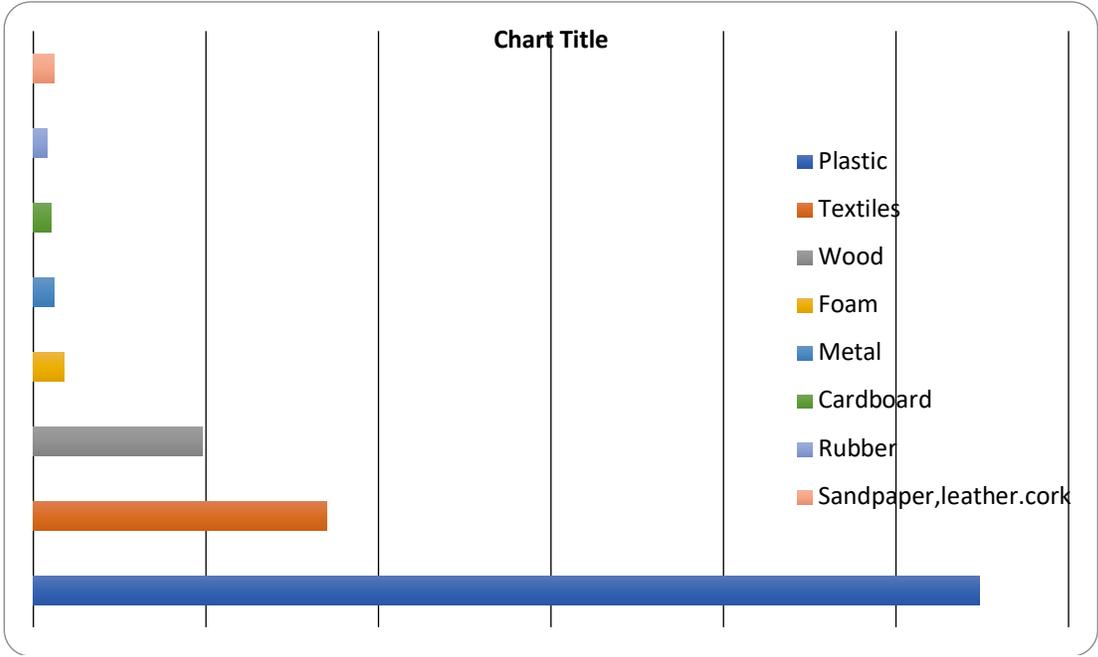
The majority of the mains and battery powered equipment and switches are made of plastic and privilege the sense of sight, which were incidentally the most expensive and were featured at the beginning of the catalogue. It would be interesting to find out how ROMPA arrange their product sections, whether there is any prioritize given?

Textiles materials featured predominantly in the hand held props that would most likely be stored away in sensory prop containers. More consideration needs to be given to the textile props in terms of scale, if they start to compete with the mains powered equipment in terms of scale, the textile sensory prop may well also become part of the sensory interface of the MSE.

Appendix 7D

The sensory quality and material quality of products in the ROMPA® catalogue





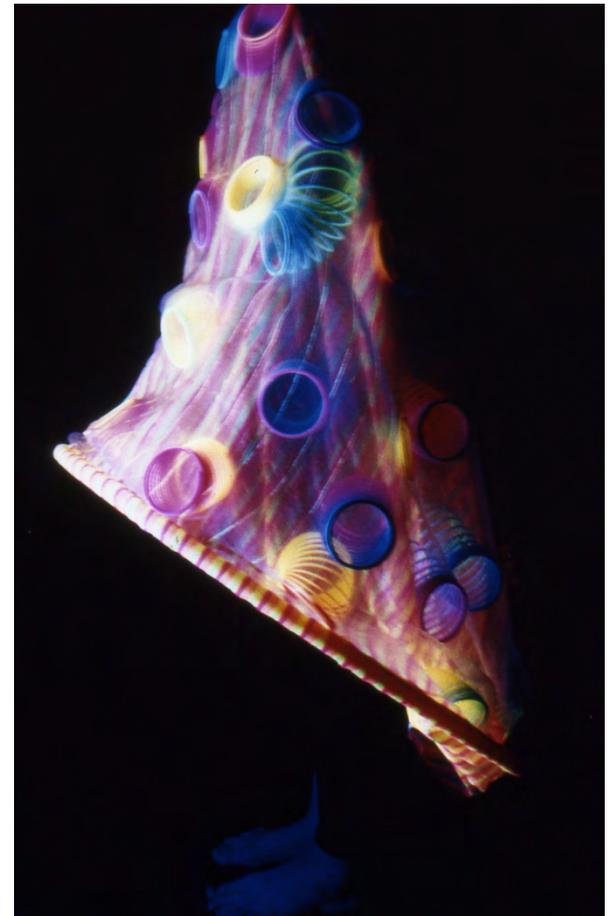
SNOEZELEN®

The development textiles props for
the multi-sensory environment to encourage
touch, movement and play

KATIE GAUDION

April 2010

The Royal College of Art



Figs. 1-3 Katie Gaudion, A collection of ultra violet reactive woven sculptures, 2002

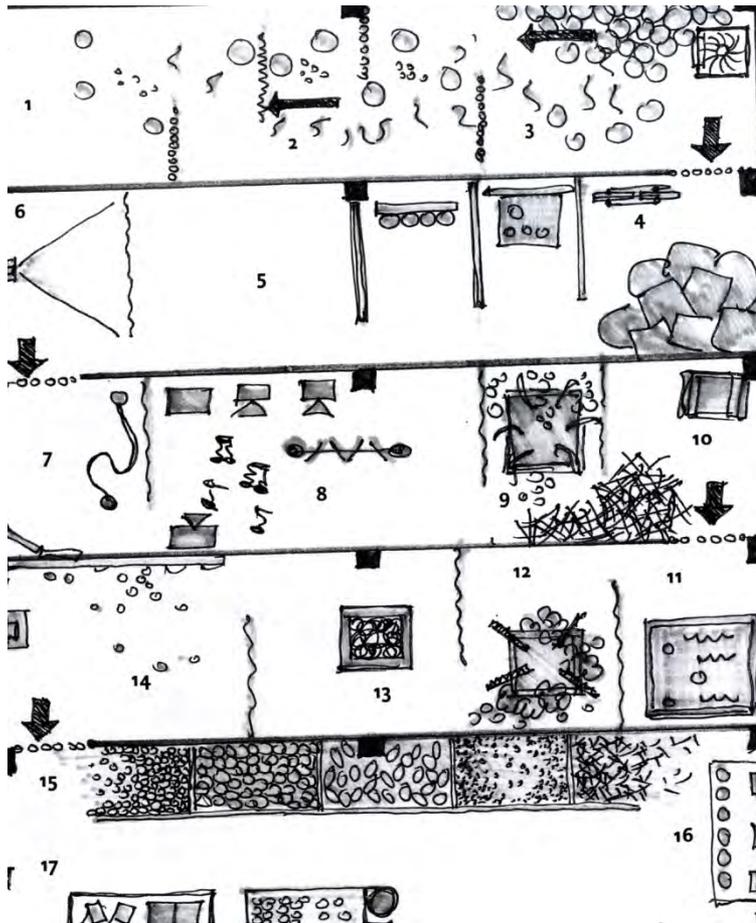


Fig.4. Floor plan: the first Snoezelen® room: the activities tent, 1978

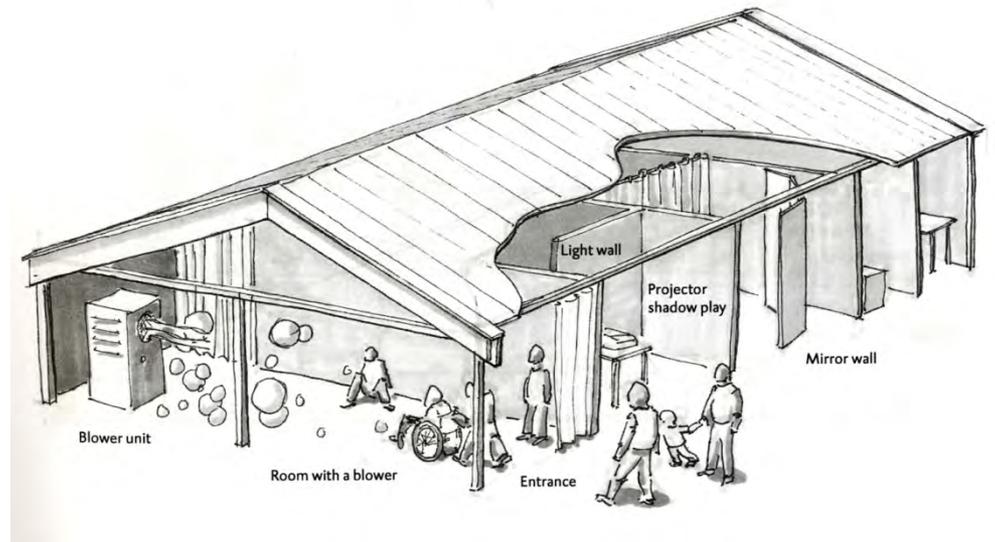


Fig.5. The Activities tent, 1978



Fig.6 Public play area, Lloyds Bank, London



Figs.7-8 Garden Centre, Guernsey

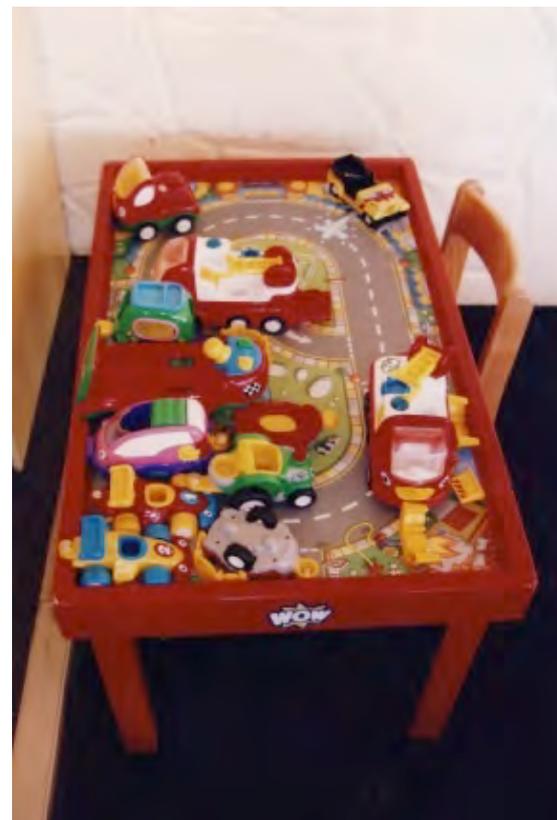




Fig.9



Fig.10



Fig.11



Fig.12



Fig. Electronic-orientated interactive games

Fig.13-15 Material-orientated interactive games



Fig.16 Café BooBah



Fig.17 Google Office: Lego Furniture



Fig.18 Google Office: fun with lego

Lego for Children and Adults!



Fig.19 Children toy Library, 2008



Fig. 20 Google Office Design,
2008



Fig.21 Kindergarten Design (2006)



Fig.24 Tree of dreams (2005)



Fig.25 Erick Mann Elementary School(2007)

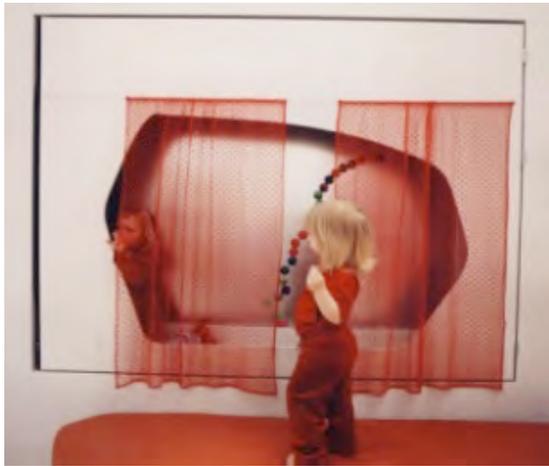


Fig.22



Fig.23



Fig. 26 Erick Mann Elementary School(2007)

Fig.21-26 The interior design of Kindergarten schools



Fig.27 Erika Mann Primary School, Berlin, 2009



Fig. 28 Google Office, Hammocks



Fig. 29 Verner Panton: Flying Chairs, 1963



Figs.30-32
Playgrounds for the Elderly, 2008



Figs.33-35 Robert Morris: BODYSPACEMOTIONTHINGS, Tate Gallery, 1971



Figs.36-38 Robert Morris: BODYSPACEMOTIONTHINGS, Tate Modern, 2009



Figs.39-42 ROMPA



Fig. 43 Friedrich Froebel, The 1st Gift, Ball, 1898.

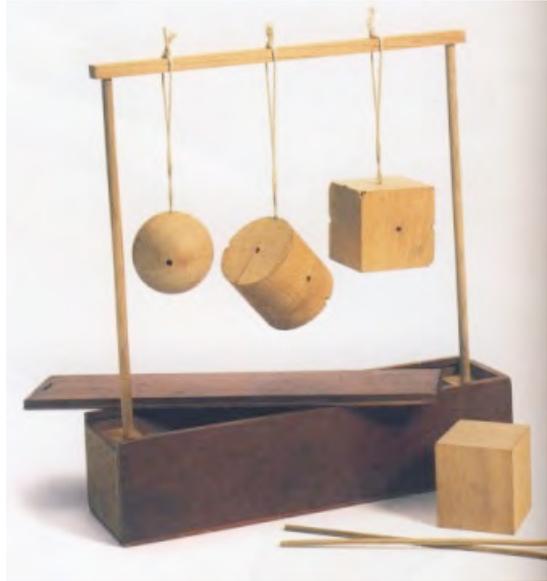


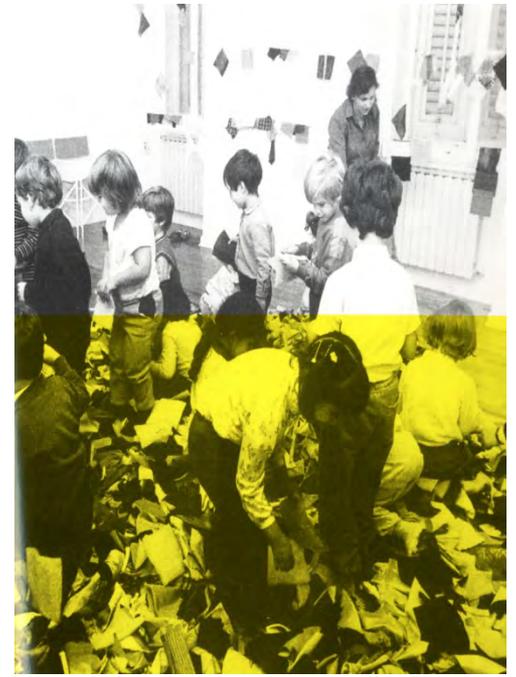
Fig. 44 Friedrich Froebel, The 2nd gift, sphere, cylinder & cube, 1890.



Fig. 45 Maria Montessori, The Pink Tower, 1910.



Fig.46-48 Montesorri activities



Figs.49-54 Tactile Workshops by Bruno Munari

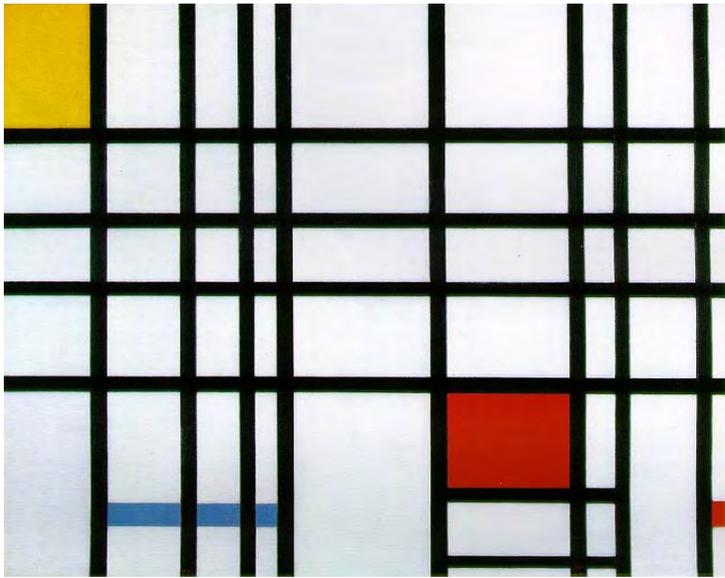


Fig. 55 Piet Mondrain Composition with Yellow, Blue, and Red, 1937-42



Fig. 56 Buckminster Fuller, Geodesic Dome



Fig. 57 Wassily Kandinsky Cossacks, 1910-1



Fig. 58 Frank Lloyd Wright, The Guggenheim Museum, New York



Fig.59 MSE at FACT



Fig.60 Multi-sensory bus at FACT



Figs. 61-63 Children interacting with the ball pool and materials in the sensory bus



Fig. 64 Little Room © by Lily Nielson



Fig. 65 Be Active box, ROMPA, 2010



Figs.66-68 The mobile teaching cubicle



Fig.69 Verner Panton: Phantasy Landscape,
1970



Fig. 70 Alan Parkinson: Luminarium (1992)



Fig.71 Early experiments with inflatables

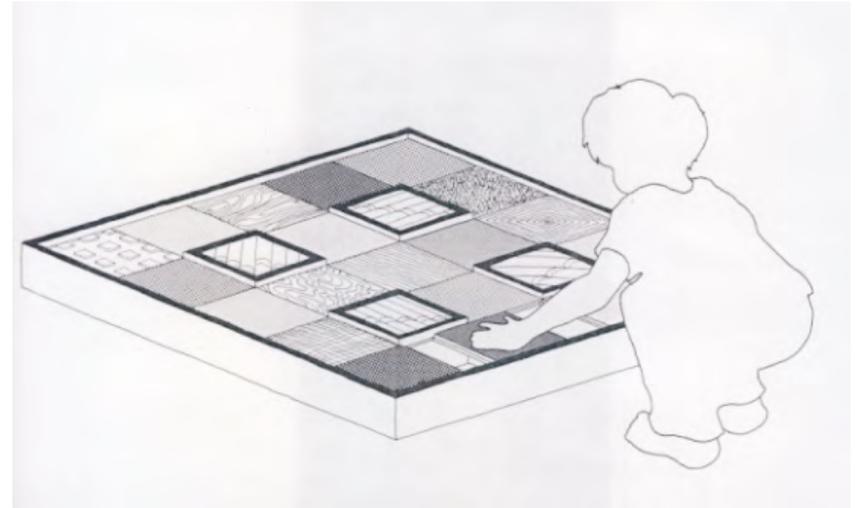


Fig. 73 Tactile boards



Fig.72 Giant tangle® Sphere, ROMPA



Fig. 74 Tac-Tiles, ROMPA



Figs.75-76 Accommodation for the residents at De Hartenburg (2008)



Figs. 77-79 The original textile sensory props in the MSE at De Hartenburg ,Holland

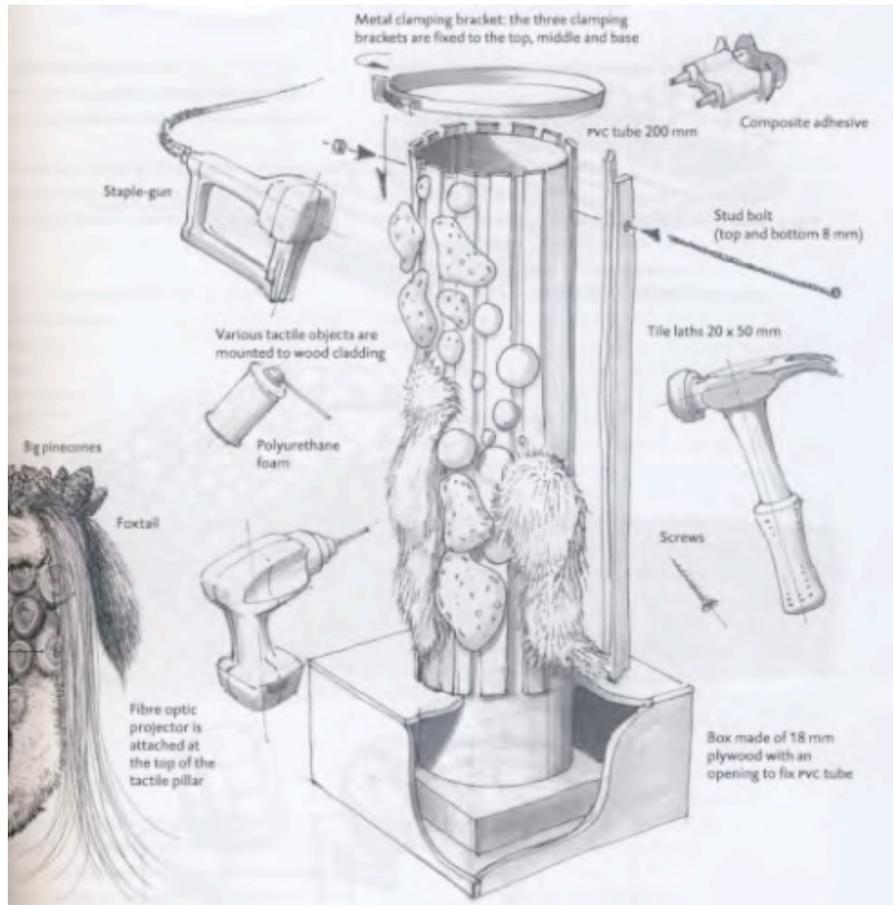


Fig. 80 Construction manual tactile pillar

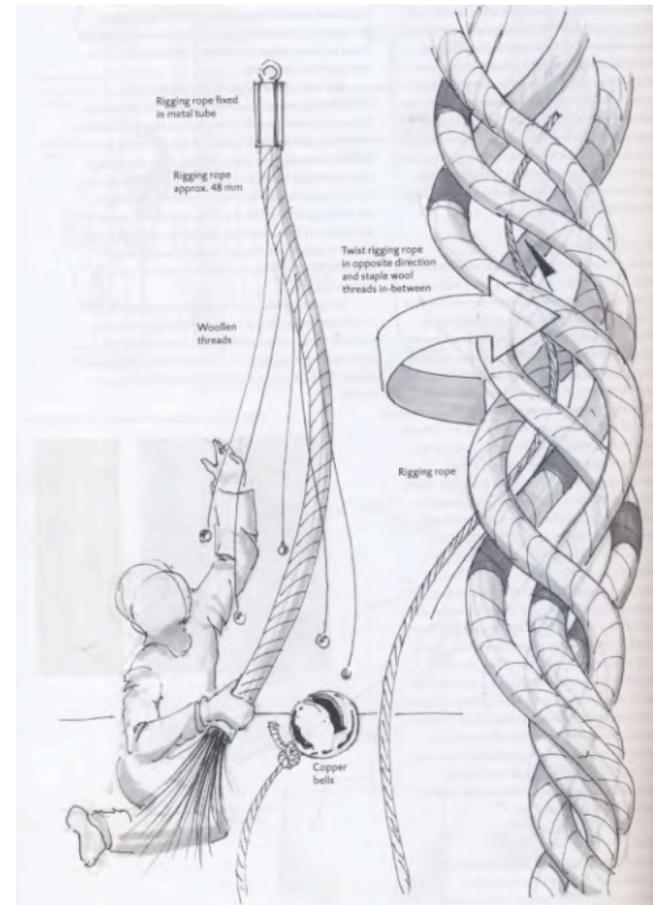


Fig. 81 Construction manual rigging rope tactile mobile



Fig.82 Ernesto Neto

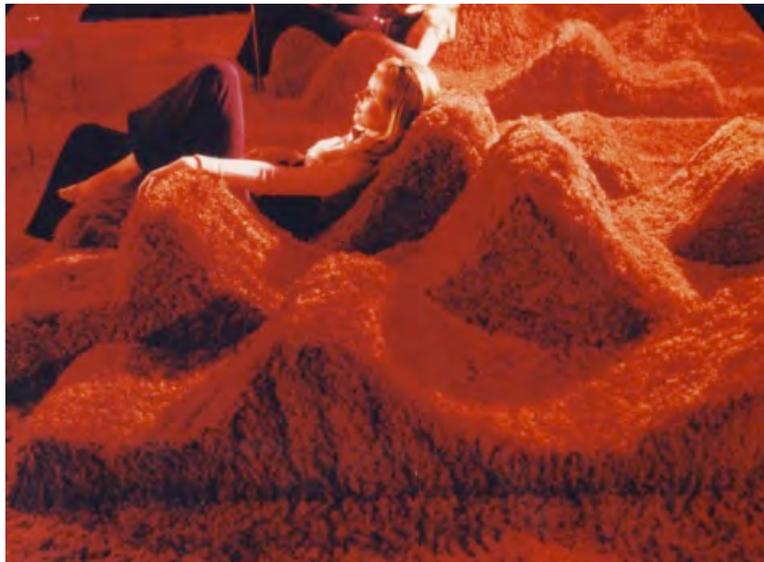


Fig.83 Verner Panton, 3D Carpet, 1969



Fig.84 Verner Panton, Phantasy Landscape, 1970

Immersive environments by Ernesto Neto and Verner Panton



Fig. 85 MSE entrance at De Hartenburg
2008



Fig. 86 Yayoi Kusama, 2008



Fig. 87 Fabio Novembre, bar
design



Fig.88 Ball pool in the MSE at De Hartenburg, 2008



Fig. 89 Anish Kapoor, Mirrored Ball, 2009



Fig. 90 Anthropodino, Ernesto Neto, 2009



Fig.91 Narcissus Garden, Yayoi Kusama, 1966



Fig.92 Heat and light reactive floor in the MSE at De Hartenburg, 2008

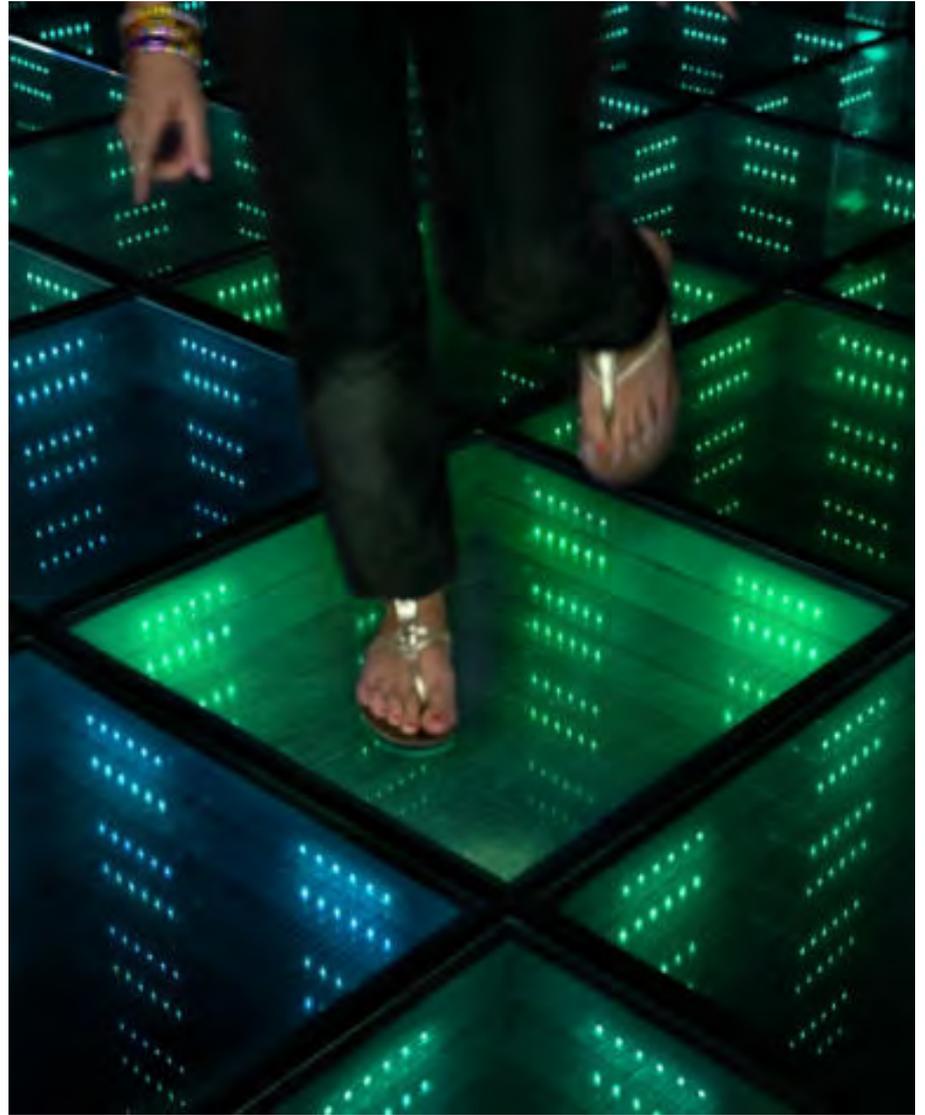


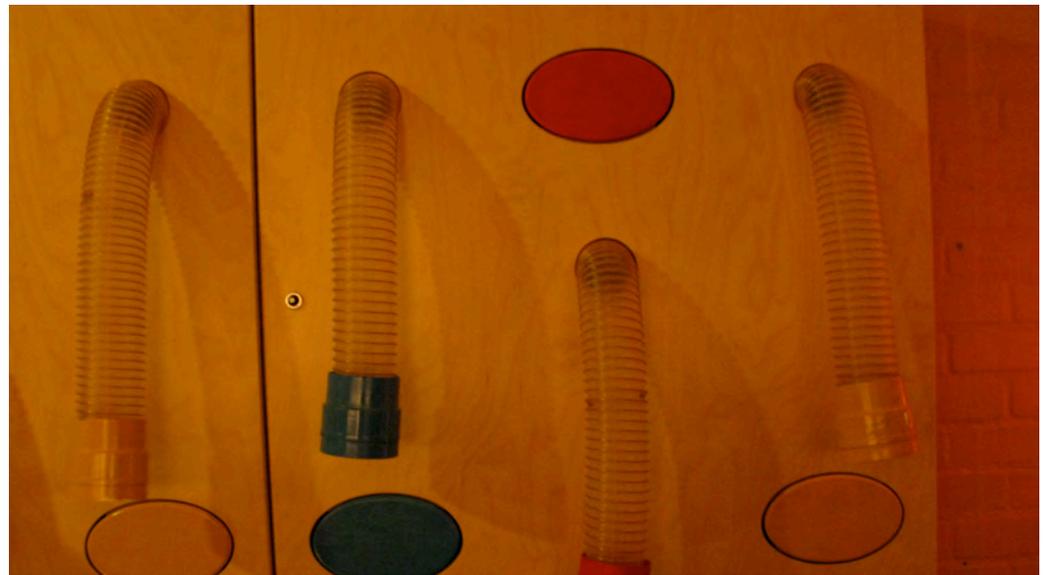
Fig. 93 Interactive sustainable dance floor at Studio Roosegaarde, Holland, 2008



Fig.94 Light reactive wall in the MSE at De Hartenburg



Fig. 95 Light brix, HeHe Association, 2001



Figs.96-99 Handmade sensory props, by Ad Verhuel



Fig.100 MSE- A



Fig 101 MSE- B



Fig.102 MSE- C

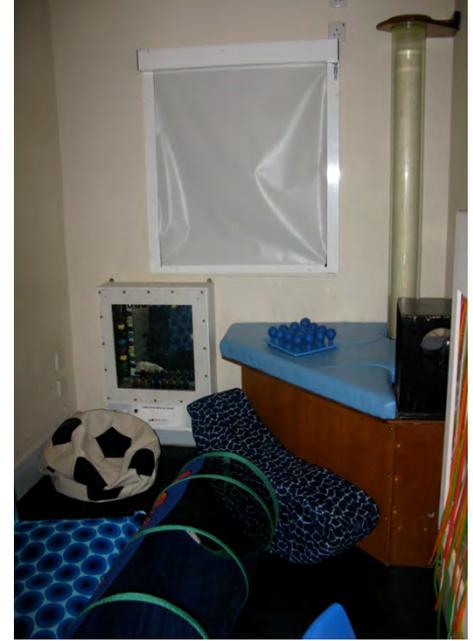


Fig.103 MSE- D

Photographs illustrating four different MSE



Fig.104 Props: MSE- B



Fig.105 Props: MSE- A



Fig.106 Props: MSE- C

The static plastic and electronic props found in the A,B,C



Fig.107 Ceiling: MSE- C



Fig. 108 Ceiling: MSE- D



Fig.109 Ceiling: MSE- B

Photographs illustrating the ceilings of the MSE



Fig.110 Broken interactive floor in MSE - C



Fig.111 Snoezelen® Wagon, ROMPA



Fig.112 Table Tent, ROMPA



Fig.113 Sensory Trolley



Fig.114 Sensory Suitcase



Fig.115 Sensory Unit



Fig.116 Manhattan, ROMPA

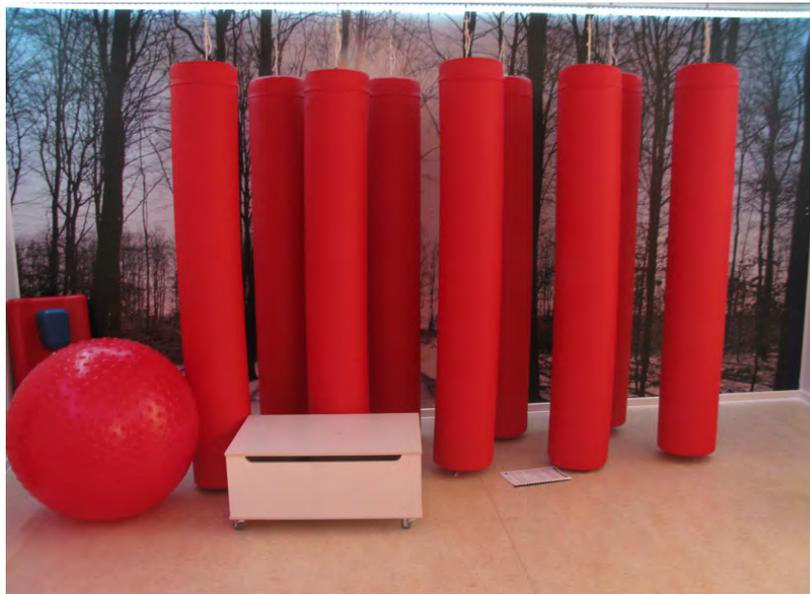


Fig.117 Sensory Safe Space

Examples of mobile sensory experiences



Figs 118-121 The exterior of The Golden Horn, Denmark 2009



Figs.122-125 Sensory Environments inside The Golden Horn, Denmark,2009



Figs.126-128 Sensory environments in side The Golden Horn, Demark, 2009



Fig.129 Nap Room, Google office



Fig.130 Slide Down, Google office



Fig.131 Massage Booths, Google office



Fig.132 Soft walls, Google office



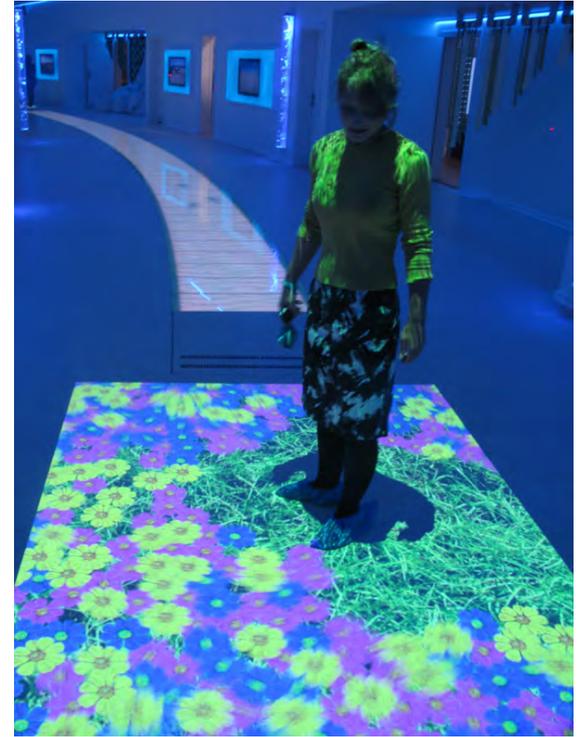
Fig.133 Strictly private conversation, Google Office



Fig.134 Google office



Fig. 135 Private Space, Google office



Figs.136-138 The entrance of The Golden Horn, Demark, 2009



Figs. 139-140 Tip-Tap Touch suspended amongst the digital screens in The Golden Horn



Fig.141 Classroom: MSE- B



Fig.142 Classroom: MSE- D



Fig.143-144 Homemade sensory box, MSE-D

Homemade sensory adaptations of the classrooms

SENSORY-IN-A-BOX KIT B (right)

FLIGHT CASE

- Set of four UV Coloured Slimline Switches
- 100 strand x 2 metre Fibre Optic and Lightsource
- Space Projector
- 8" Battery Powered Mirror Ball, Stand, Pinspot and Filters
- Sound Activated Switch

PLASTIC SENSORY CASE

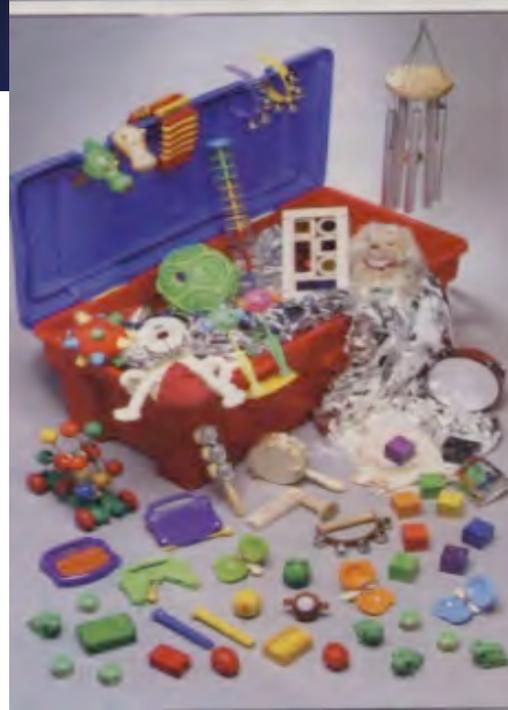
- Inflatable UV Ball
- 3 x Space Blankets
- Maglite Torch
- Vibrating Snake
- Deedle Dude
- Butterfly Castanets
- 2 x Fun-Size Tock! Glitter tubes
- Threading Butterfly
- Mirror Chimeabout
- Rainmaker
- 2 x Egg Shakers
- Clatterpillar
- 2 x Koosh Balls
- 2 x Hedgehog Balls
- 4 x Fluff Balls
- 3 x Sensory CDs
- Mustafa Hamster
- Black Magic Box
- Portable Rechargeable Interactive Bubbletube with Carrier Bag



06 34 12 7 Sensory-in-a-Box Kit B

£1655.00 (V)

Fig. 146 Tactile vibration sensory tub
£395.00, Spacecraft™



TACTILE VIBRATION SENSORY TUB

The Tactile Vibration Sensory Tub contains items which will offer contrasting experiences such as Warm/Cold, Soft/Hard, Smooth/Rough, Reflective/absorbant and round/angular. The vibratic items can be held or placed against the body. Comes in a sturdy wheeled tub with a suggested 'Ideas of Use' manual covering each item of equipment. Size of Tub: 600mmW x 390mmL x 300mmH.

Contents:

- | | |
|---------------------------------|--------------------------------|
| • 1 x Study Wheeled Tub | • 1 x Sensyball |
| • 2 x Contrasting Tactile Trays | • 1 x Cherry Stone Neck Pillow |
| • 1 x Vibrating Bumble Ball | • 1 x Koosh Ball |
| • 1 x Japanese Brush | • 2 x Furry Mittens |
| • 1 x Wiggly Worm | • 1 x Smiling Flower |
| • 1 x Deedle Dude | • 1 x Groovy Skwish |
| • 1 x Tactile Rhythm Pal | • 1 x Z Ball |
| • 1 x Pinpression | • 2 x Water Wigglers |
| • 1 x B Wheel Messenger | • 1 x Scooter the Dog |
| • 1 x Sheepskin | • 1 x Vibrating Snakes |
| • 1 x Zoompf Ball | • 1 x Spider Ball |
| • 3 x Space Blankets | • 1 x Beady Buddy |
| • 1 x Cellulite Massager | • 1 x Morpho Ball |
| • 1 x Nobbly Wobbly | • 1 x Vibrating Pillow |
| • 4 x Geo Rattles | • 1 x Whizzler Ball |
| • 2 x Masse Ladybirds | • 2 x Smiley Faces |
| • 1 x Wiggly Giggly | • 1 x Brush and Smoothie |
| • 2 x Wheel Messenger | • 1 x Hedgehog Ball |

406 34 14 1 Tactile Vibration Sensory Tub

£395.00 (V)



Fig. 145 Sensory in-A-Box
kit £1655.00, Spacecraft™

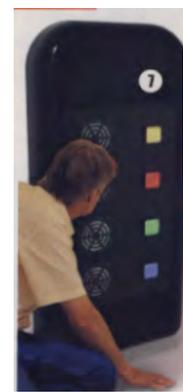


Fig.148 Switch activated equipment, ROMPA catalogue, 2010



Fig.149 Interactive Wall, Jason Bruges, Hotel Puerta America,2005



Fig.150 CAVE Automatic, Virtual Environment, 1991



Fig.151 Funky Forest: An Interactive Ecosystem, 2007



Fig.152 Mediate



Fig.153 Mediate



Fig.154 mediate



Fig.155 Deep Walls, by Scott Snibbe, 2003



Fig. 156 -160 Studio Roosegaarde: Liquid sculpture and developing an interactive façade, Holland 2008

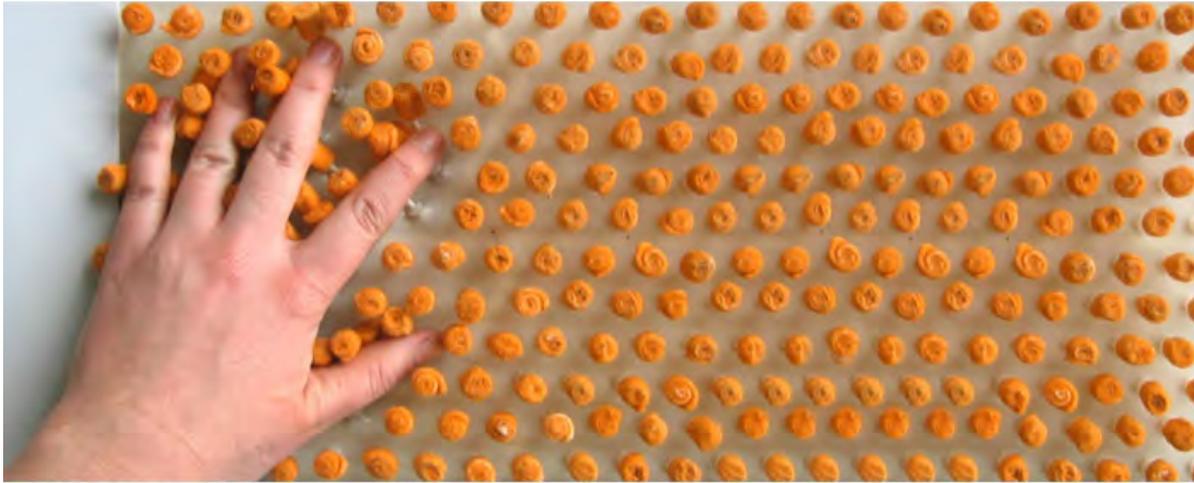


Fig.161 Super Cilia Skin, 2004



Fig.162 Robotic wiping cleaner
"Fukitorimushi"



Fig.163 BMW GINA 2008



Fig.164 Mette Ramsgard Thomsen
robotic membranes, 2007



Fig. 165 MetroNaps: Energy Pod, 2004



Fig. 166 A suspended chair in the MSE at De Hartenburg, 2008



Hand loom Factory, Kerala, India, 2001

Power loom Factory, Kerala, India, 2001

Figs. 167-170 The working environment of a hand loom and power loom factory, India, 2001



Figs.171-173 Peter Zumthor: Thermal Bath Vals, Graubunden, Switzerland, 1990



Fig.174 The MSE at De Hartenburg, featuring a disco ball, 2008

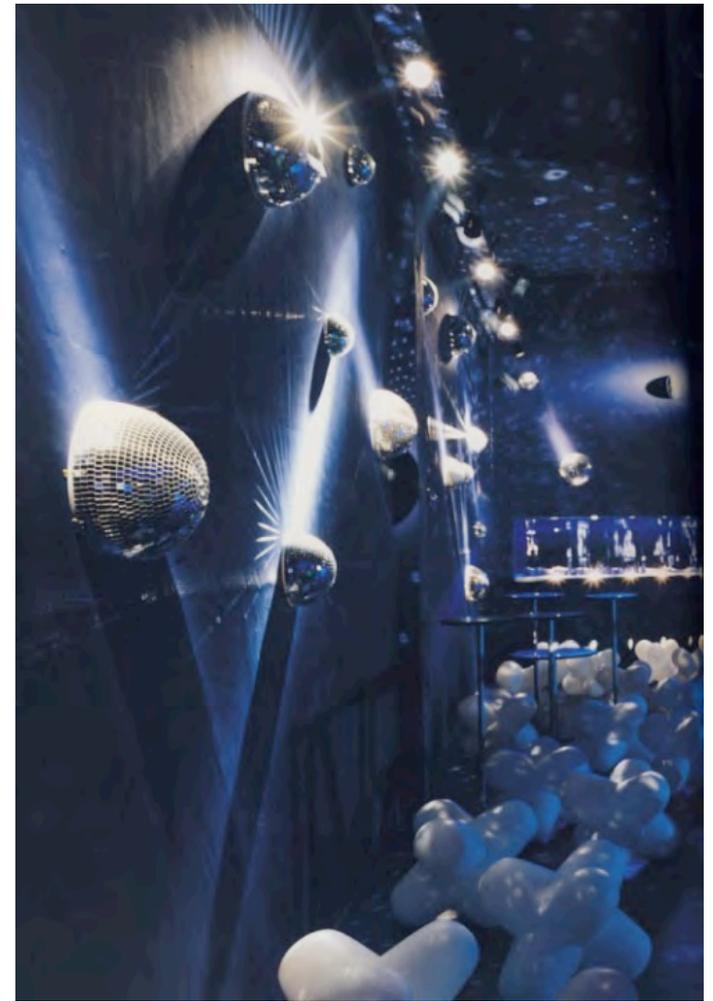


Fig. 175 Fabio Novembre interior design, featuring Disco balls



Fig. 176 DECODE: Daniel Rozin Weave Mirror, 2007



Fig. 177 DECODE: Mehmet Akten Body Paint, 2009

Interactive exhibitions at the Tate Modern



Fig. 179 Rachel Whiteread, 2006



Fig. 180 Bodyspacemotionthings, Robert Morris, 2009

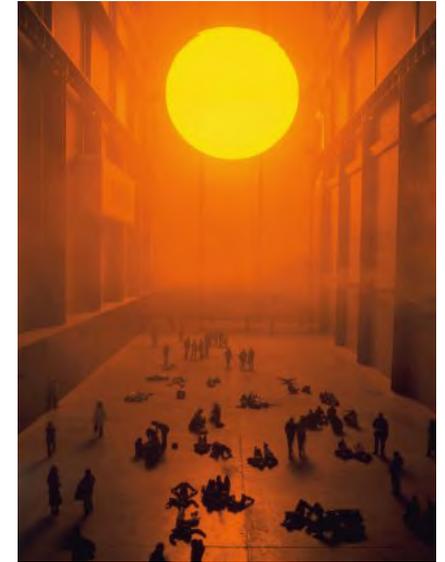


Fig.178 "The Weather Project" Olafur Eliasson, 2003



Fig. 182 Cildo Meireles, 2008



Fig.181 Miroslaw Balka, 2009



Fig. 183 Verner Panton: Swimming pool, 1969



Fig.184 Chihuly: Swimming pool, 1994



Fig. 185 Verner Panton: Two Level Seat (prototype), 1973, Metzeler

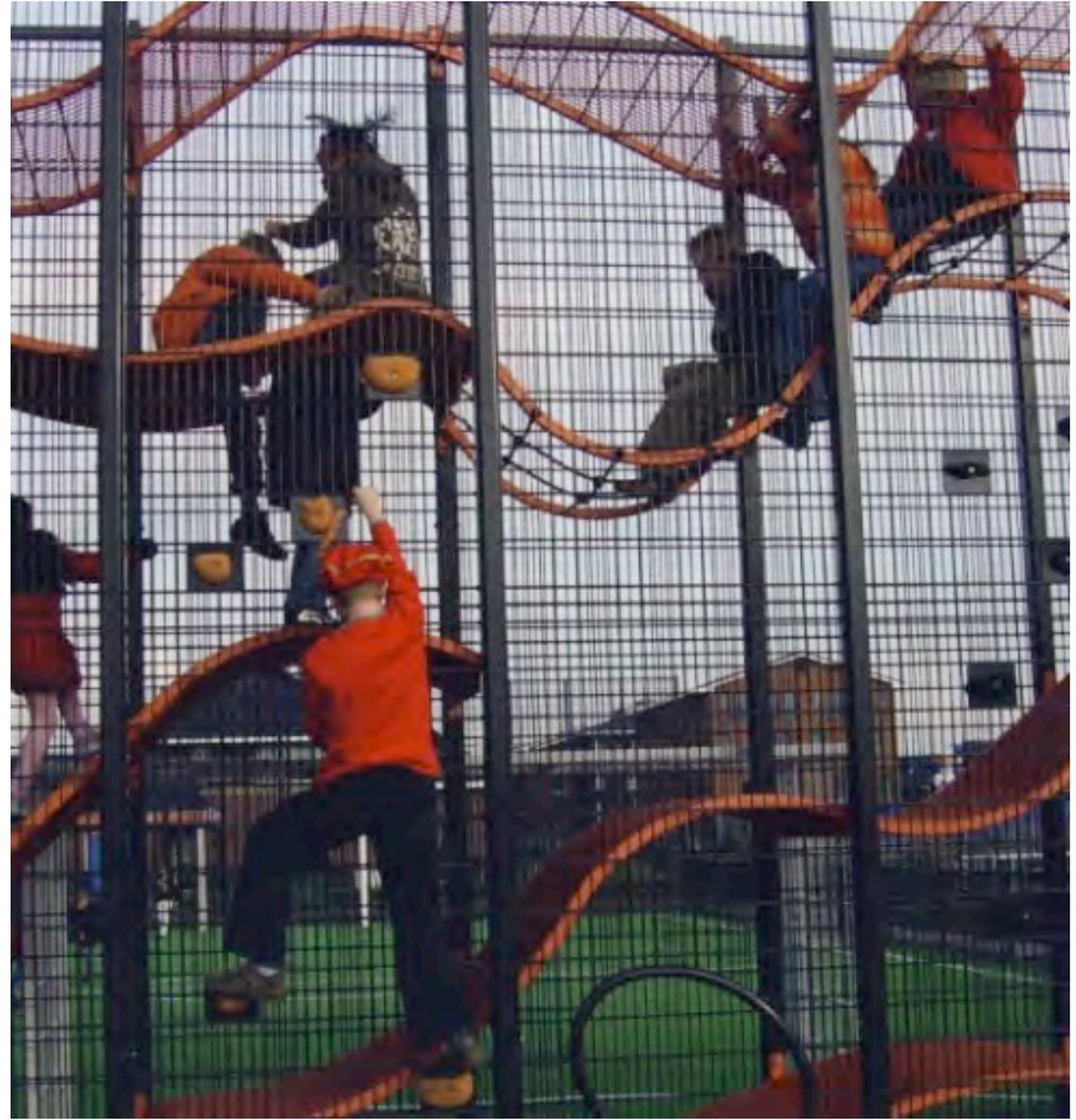


Fig. 186 Carve, Wall-Halla, 2005



Fig. 187 Verner Phanton: shell lamp ceiling, 1985/85



Fig. 188 Bamboo skewer ceiling, 2005

photo: Michael Moran



Fig. 189 Verner Panton, Interior Design, 1971



Fig.190 Google Office, Interior Design

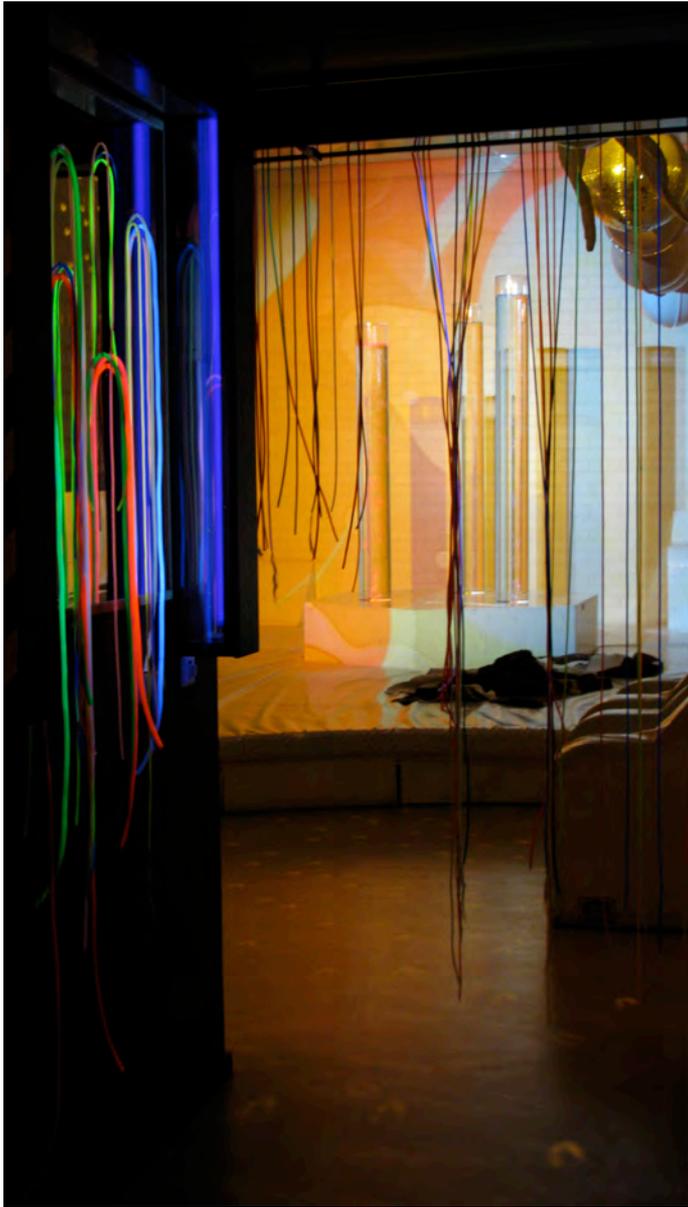


Fig. 191 The MSE at De Hartenburg



Fig. 192 Tune Me, Immersive conceptual radio, Touch Me :
design and sensation, Victoria and Albert Museum,
London, 2005



Figs. 193-194 Breathair™ Toys Comprising visible air, Senseware, 2009



Fig. 195 Flock Printing, Kiwi like texture, Haptic, 2009



Fig. 196 Pairs of haptic geta, Haptic, 2009



Fig. 197 Playing with toys, Ostrava, Czechoslovakia, 1923

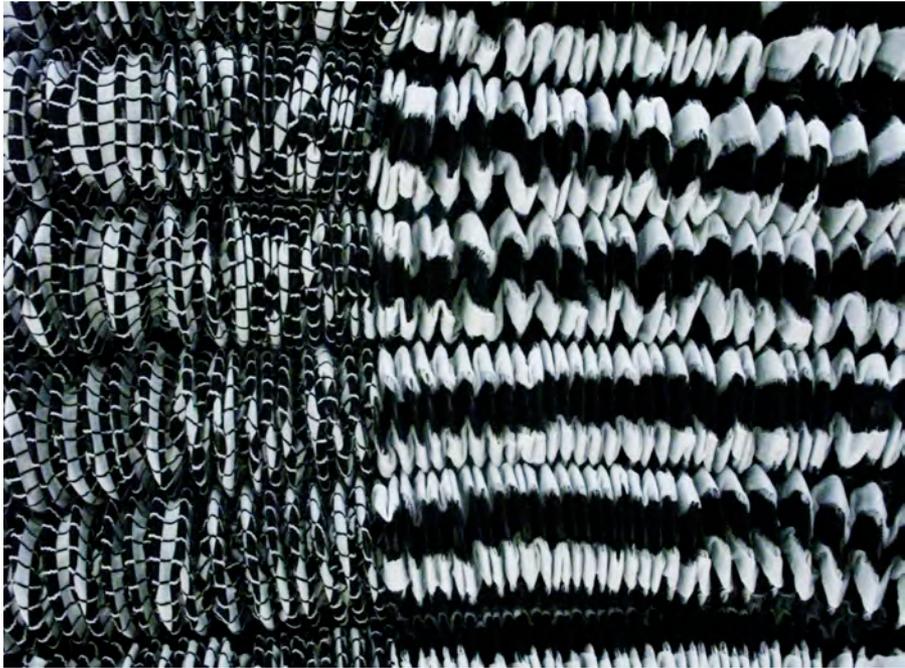


Fig.198-200 Springy-Thingy





Southpaw weighted blanket



Sand snake



Southpaw weighted shoes pockets



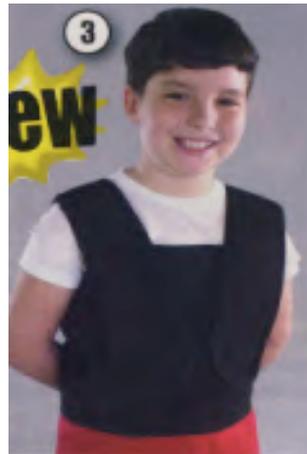
weighted vests



Weighted cushions



Fig. 201 Weighted products



Bear Hug



Weighted neck wrap



Weighted lap pad wrap



Fig. 202 Toys and Playthings

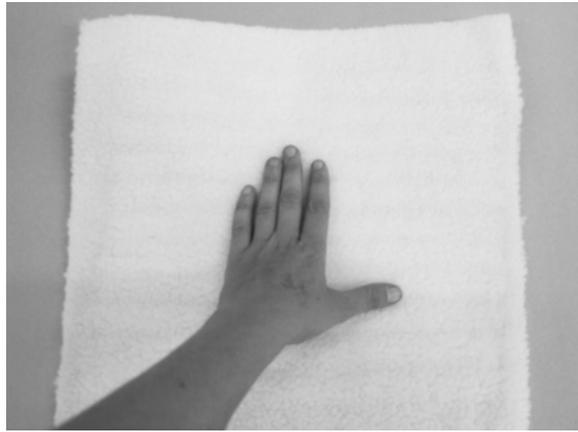
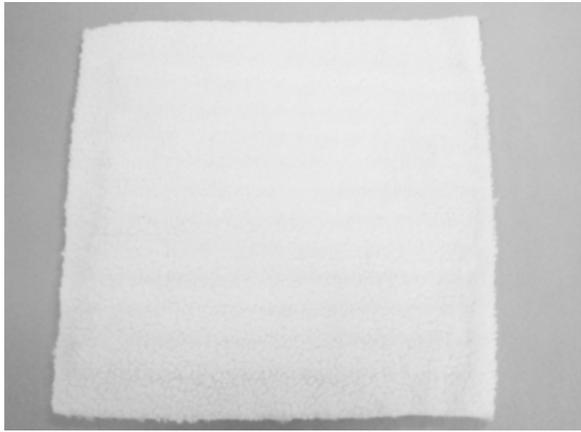


Fig. 203-206 Snap-wrap Textiles

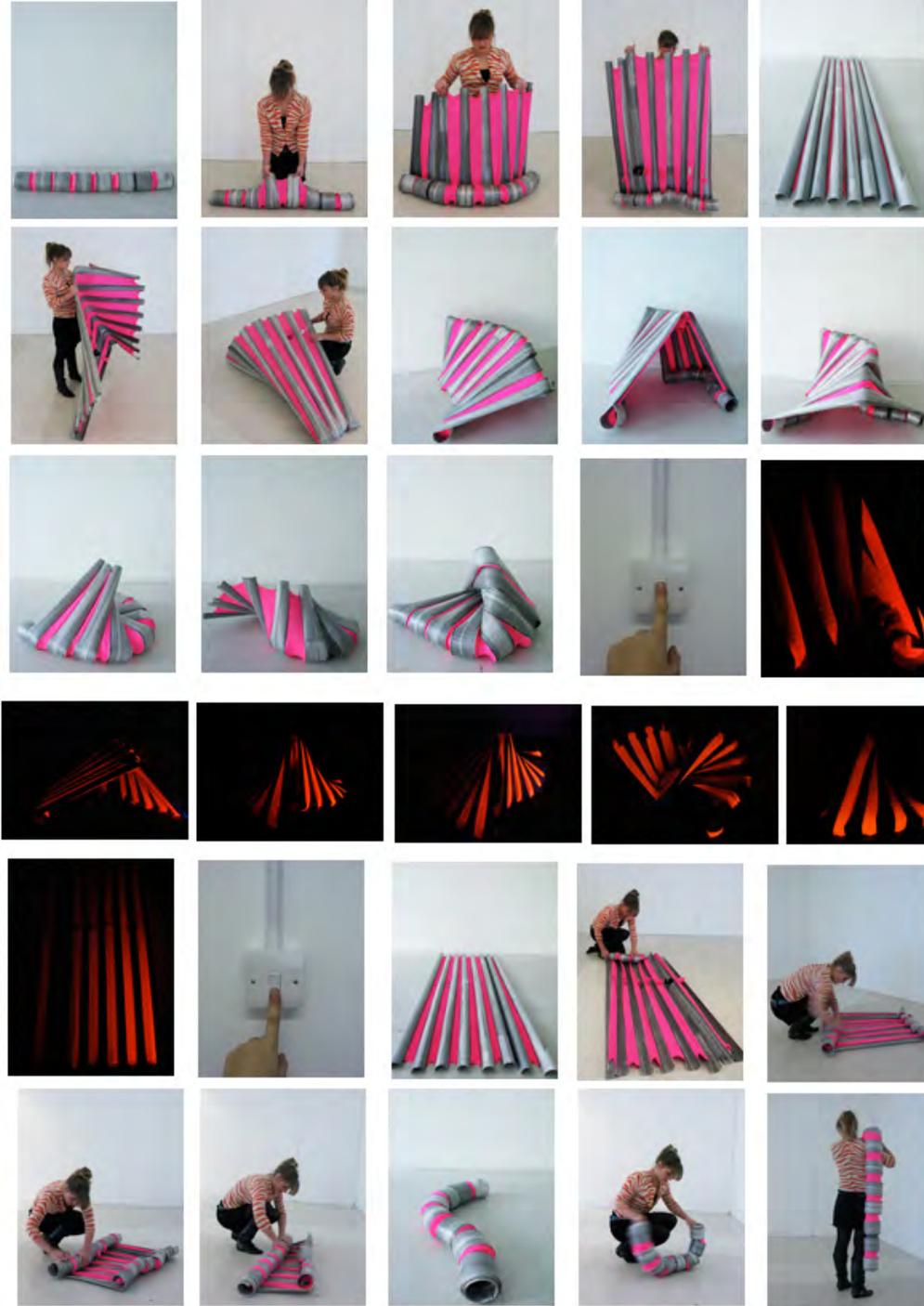


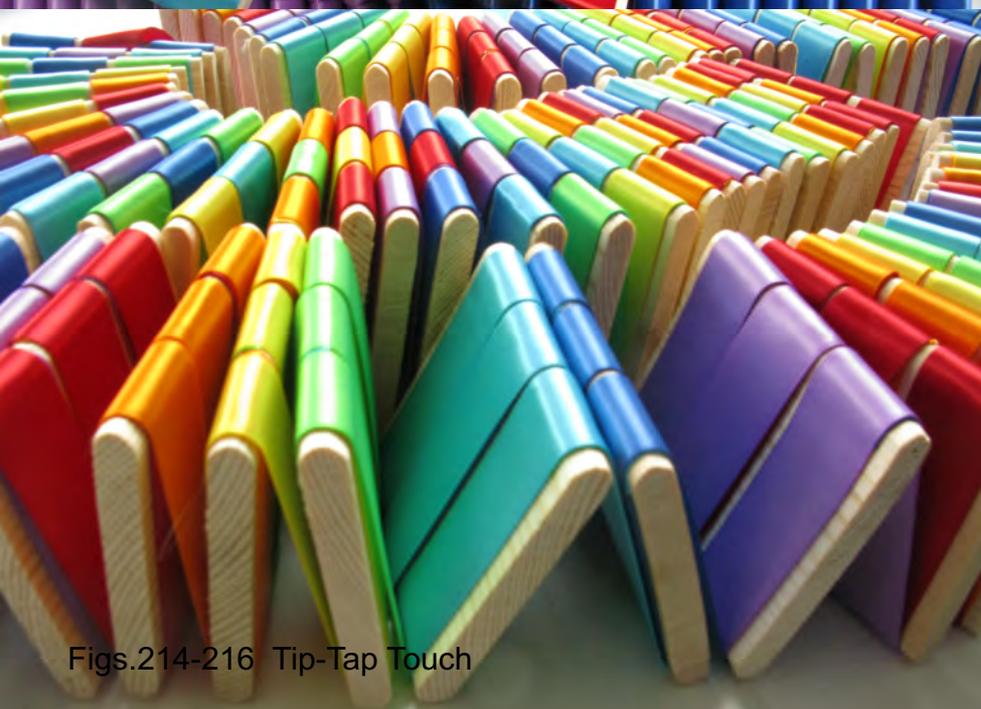
Fig.207 Rola-Textiles



Figs. 108-110 Marbelous



Figs. 211-213 Tactile Journey



Figs.214-216 Tip-Tap Touch

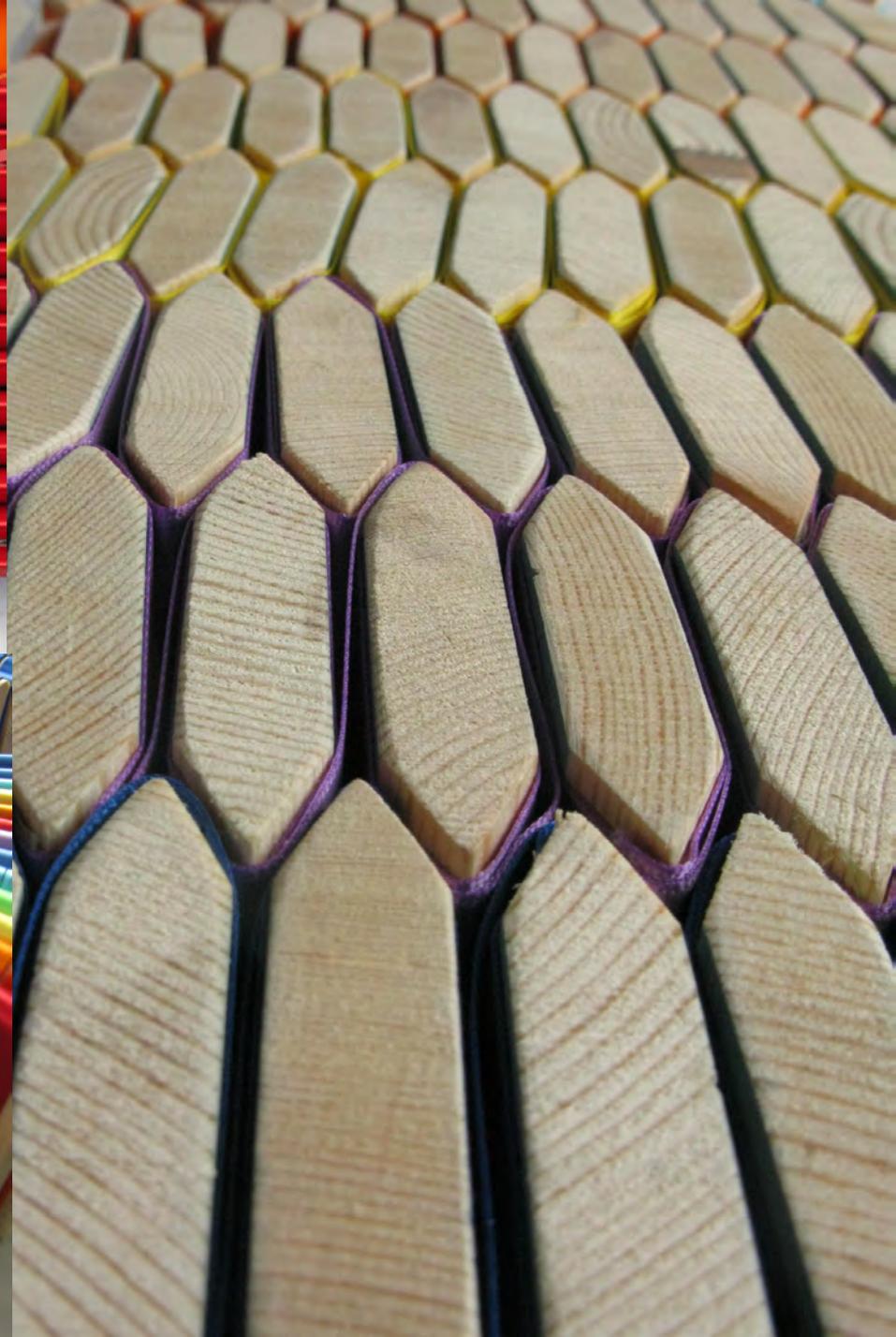




Fig.217 Tip-Tap Touch



Fig.218 Montessori activities at Brethren Retirement Community



Fig. 219 Digging for objects



Fig. 220 Swinging



Fig. 221 Bubble ball bath



Fig. 222 Brushes, textured mitts and joint compression



Fig. 223 Large pillow for burrowing