Designing Interactive Play Experiences for Sick Children in Hospital

A Thesis submitted in fulfilment of the requirements for the degree of Master of Arts.

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Ruth Sancho Huerga

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Contents

Acknowledgements ........................................................................................................... 5
Abstract ............................................................................................................................... 6
Research Question ............................................................................................................. 7
1. Introduction .................................................................................................................... 8
2. The self .......................................................................................................................... 10
  The self .......................................................................................................................... 10
  Self-esteem (The I-self and the Me-self) ............................................................................. 11
  Body self-perception ....................................................................................................... 12
  The Global self .............................................................................................................. 13
3. Related work .................................................................................................................. 16
  Play .............................................................................................................................. 16
  Art and movement therapy ............................................................................................ 18
  Interactive media .......................................................................................................... 21
4. My Approach ................................................................................................................ 24
  4.1 Design methods ...................................................................................................... 24
  4.2 Design goals .......................................................................................................... 24
  4.3 Design Approaches ............................................................................................... 25
    4.3.1 Implementation: Co-Design ............................................................................... 25
    4.3.2 Content: Jacques Lecoq’s Theatre Technique ....................................................... 28
    4.3.3 Context: Desensitisation ....................................................................................... 30
    Desensitization goals ................................................................................................. 30
5. The Workshops .............................................................................................................. 32
  5.1 Objectives .............................................................................................................. 32
    Objective 1: Reframing medical equipment .................................................................. 32
    Objective 2: Reframing the hospital environment ......................................................... 32
    Objective 3: Reframing medical tasks ......................................................................... 33
    Objective 4: Reinforcing children’s sense of ownership and control ......................... 33
  5.2 Design process ........................................................................................................ 33
    5.2.1 Laughter Tree .................................................................................................... 34
    5.2.2 Doctor Giggles .................................................................................................. 36
    The shadow puppets and graffiti names ..................................................................... 36
    5.2.3 X-Safari ............................................................................................................ 41
6. Evaluation ..................................................................................................................... 44
  6.1 Demographics ........................................................................................................ 45
  6.2 Data gathering methods ......................................................................................... 47
  6.3 Questionnaires ...................................................................................................... 47
  6.5 Interviews ........................................................................................................ ...... 48
7. Findings ........................................................................................................................ 49
  7.1 Analysis of the findings ........................................................................................ 49
    7.1.1 Artefacts .......................................................................................................... 49
    Shadow puppets .......................................................................................................... 49
    Graffiti names ............................................................................................................ 50
    Hand Glove Puppets .................................................................................................. 50
    7.1.2 Notes ............................................................................................................... 52
    7.1.3 Questionnaires ................................................................................................. 54
7.2 Where the goals achieved? ................................................................. 55
  7.2.1 Reframing medical equipment ....................................................... 55
  7.2.2 Reframing the Hospital Environment ............................................ 57
  7.2.3 Reframing medical tasks .............................................................. 58
  7.2.4 Reinforcing sense of ownership and control ..................................... 58
7.3 Additional Findings ............................................................................ 59
  7.3.1 Positive Findings ........................................................................... 59
    Body Movement .................................................................................... 59
    Body Representations .......................................................................... 60
    Positive Body Awareness ...................................................................... 61
    Reinforcing the sense of self .............................................................. 61
    Reinforcing global sense ..................................................................... 62
  7.3.2 Negative Findings ........................................................................... 64
7.4 Group Findings .................................................................................... 65
  7.4.1 Bodily representation ...................................................................... 65
  7.4.2 Bodily auto-topography ................................................................. 65
  7.4.3 Bodily creative communication ...................................................... 65
    Making and moving ............................................................................. 65
    Sharing ................................................................................................. 66
    Motivation ............................................................................................ 67
8. Discussion .............................................................................................. 69
  8.1 The dimensions .................................................................................. 69
    8.1.1 Bodily representations ................................................................. 69
    8.1.2 Bodily auto-topography ............................................................... 71
    8.1.3 Bodily creative communication .................................................... 72
      Intrapersonal Communication ............................................................. 73
      Interpersonal Communication ........................................................... 73
  8.2 Tactics ............................................................................................... 74
    8.2.1 Bodily representation tactics ....................................................... 74
    8.2.2 Bodily auto-topography tactics ..................................................... 76
    8.2.3 Bodily creative communication tactics ........................................... 77
  8.3 Limitations and Future Work .............................................................. 78
    8.3.1 Testing the design dimensions with other designers ....................... 78
    8.3.2 Implementing the tactics .............................................................. 78
9. Conclusion .............................................................................................. 79
Appendix .................................................................................................... 81
  Ethics Approval ...................................................................................... 82
  Letter of Approval from The Hospital La Fe of Valencia .......................... 83
  Letter of Approval from The Hospital Sant Joan de Deu of Barcelona ........ 84
  Questionnaire for participants in the hospital workshop .......................... 85
  Invitation sent to potential workshop participants in the hospital .............. 86
References ............................................................................................... 87
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Abstract

For sick children, hospitals provide a challenging environment for the development of a positive sense of self. I believe the opportunity for creative self-expression plays an important role for hospitalised children to develop such as positive sense of self. In response I have designed workshops to support such self-expression around a positive sense of self using Co-Design, Desensitization and Lecoq's theatre techniques. These workshops centered around two interactive digital games I designed: ‘Doctor Giggles’ and ‘X-Safari’ that aim to reframe and personalise children’s hospital experiences. The outcomes from the workshops suggest that designing personalised play for sick children by reframing the hospital environment, medical equipment, procedural tasks and family relationships through humour and creativity can support the development of children’s positive sense of self. In order to guide other designers and play therapists in facilitating such workshops, I have derived three design dimensions – bodily representations, bodily auto-topography and bodily creative communication and a set of design tactics. These insights are aimed at contributing to our understanding of how to support sick children in hospital.
In this research, I have investigated the design and creation of physical and digital play throughout workshops so that they may be used as complementary care for sick children in hospital. These workshops were conducted in the Hospital Sant Joan de Déu in Barcelona (Passeig Sant Joan de Déu, 2, 08950 Esplugues de Llobregat, Barcelona) and the Hospital La Fe (Avinguda de Fernando Abril Martorell, nº 106) in Valencia, Spain. The aim of these creative play workshops was to develop children’s positive perception of the self. Therefore, the project investigates the potential of creative play to transform the condition of being in hospital into a more creative experience.

The research question that the project investigates is: ‘How do we design creative play workshops to support the development of the self for sick children in hospital?’

In summary, my research “Designing Interactive Play Experiences for Sick Children in Hospital” investigates the potential of creative play to transform the condition of being in hospital into a more creative experience.
1. Introduction

This practice based research project has developed from reflecting on personal experiences as well as drawing inspiration from other practical projects and initiatives concerned with children’s personal experiences such as Clown Doctors (“Clown Doctors, The Humour Foundation,” 2011). In particular the project draws from a personal life experience of what it means to be a sick child in hospital as well as the experience of being a professional artist and a laughter therapist.

As a child, I went to hospital many times as an out-patient for treatment of a blood disease; later as a family we also spent much time with my father in hospital because he developed a motor-degenerative illness. My father was a visual artist, musician and a dancer, as are my mother, my sister and I. During my father’s treatment, I witnessed and experienced the therapeutic power of the arts on my relatives’ emotional well-being and myself. Illness, pain, anxiety, fear and stress were part of our lives, but because of my artistic family, our home life remained full of vitality, creativity, vivacity and enjoyment. I encountered moments of emotional suffering that I could overcome through play and art. Therefore, for me, art and play became my most important treatment.

As a sick child in hospital, my family experienced emotional and physical disruption once I became ill. The family dynamics changed as family members needed to adapt quickly to new agendas and changes in lifestyle. These changes caused feelings of anxiety, guilt, rage and stress. In this context, play and creativity performed an important role to relieve these feelings and restore a more positive, light-hearted, loving, relaxing and creative experience of being sick in hospital. Play brought back my childhood and creativity reinforced a more
positive development of my ‘self’. Both play and creativity became emotional healing tools that my family and I used as complementary care.

My research has investigated, supported and facilitated the development of creative play workshops for sick children in hospital. In this research I have developed two digital games that combine physical and digital elements in order to support sick children’s positive perception of the self. These games have built on other projects for sick children that have been running in hospitals for the last decade such as Clown Doctors ("Clown Doctors, The Humour Foundation," 2011), Starlight ("Starlight," 2014) or ChildLife ("ChildLife," 2012). I like these initiatives as they have focused on the development of children’s sense of self through creative play and the reality of being a sick child in hospital rather than trying to distract children from their situation.

I approached the self from my theatre and performative play background through the different perspectives of ‘self-esteem’, ‘bodily perception’ and ‘global self’ (Harter, 2012) because these concepts of the self are affected by being a sick child in hospital and are important in the development of a positive sense of the self. In the next section, I will explain these concepts.

In summary, I believe a positive development of the self is very important for children to grow up in a healthy way; in contrast a negative construction of the self can develop future traumas and frustration during teenage years and early adulthood. Hence, helping sick children in hospital to develop a positive construction of the self can support children’s future development.
2. The self

In this chapter, I am expanding on the concept of self as it will help to answer my research question on how to support the development of a positive sense of the self in sick children in hospital.

Hospitalised children can undergo many bodily changes because of their illness or recovery treatments. For example, children with cancer can suffer emotional side effects such as sadness, anxiety, and also physical changes such as alopecia, weight change and amputation from recovery treatments (Pinquart, 2012). These changes can be very stressful and painful when children do not have enough strategies to cope with their changing self. For instance, the main theme that emerged from adolescent cancer patients when talking about their self is that they “don't look normal” (Larouche and Peuckert, 2006). In response it has been suggested by Hart and Rollins (2011) that creating play as a strategy to approach children’s sense of the self from an enjoyable perspective can be very helpful for the development of positive emotional health (Hart & Rollins, 2011).

The next section offers a brief explanation of ‘the self’ from different perspectives in order to present a theoretical context for my research. These perspectives are ‘Self-esteem (the I-self and the Me-self)’, ‘Body self-perception’ and the ‘Global self’.

The self

The idea of the self has changed through the history of humanity. In the romantic period, the self was related to the interior and understood in terms of morality, spirituality, creativity, and the soul; in the Modernism of the 20th century, the self became a rationalist concept. The Post-Modernist movement developed a more
relative idea of the self (Harter, 2012). In this chapter, I relate to Susan Harter’s (2012) construction of the self in which she distinguishes two main agents based on William James’ theory (James, 1984): the ‘I-self’ (the actor of knowledge) and the ‘Me-self’ (the object, the known) (Harter, 2012).

**Self-esteem (The I-self and the Me-self)**

Self-esteem is, at root, a measure of children’s judgment of their own worth, primarily built through positive experience (Hart & Rollins, 2011). It grows as children experience loving positive communication and as they take on and master difficult mental challenges (Harter, 2012). Such experiences can give rise to a genuine sense of accomplishment, pride and belonging (Plummer, 2007).

Susan Harter (2012) outlines how the I-self refers to the physical real person, the ‘actor of knowledge’, whereas the Me-self refers to the mental idea (the object of knowledge) that everyone creates and develops of this I-self. The I-self develops in childhood and undergoes many different cognitive changes, impacting and reshaping the construction and development of the Me-self (Harter, 2002). This is important for this research as I believe sick children’s I-self can strongly influence the construction of the Me-self.

Several social psychologists such as Gergen (Gergen & Gergen, 1988), Mischel (1971), as well as Wenger and Vallacher (1980), assert that the theory of the self must take into account the multiple roles that people adopt. In particular, adolescents develop the ability to construct multiple and even contradictory selves (Harter, 2012). This is important when supporting sick children in their late middle childhood (from 7 to 12 years old) because it suggests that any construction of the Me-self might not actually be the real I-self. In other words, the I-self and the Me-self are changing. I draw from this that the work should support children in choosing from different selves rather than feeling constricted into a single self. Multiple representations of the self can expand the
idea of change of the I-self (Lewis & Mitchell, 1994) increasing the perception that ‘being sick in hospital’ is just one representation of the Me-self, which can change. Furthermore, Schilder (1999) describes body image as the picture of our body that we form in our mind (the Me-self). Healey (2008) defines it as the mental picture people have of their own body including size and shape. In the next section I will explain the concept of body self-perception in detail.

**Body self-perception**

Body self-perception is the construction of the self in our mind through the perception of our body (Healey, 2008). I believe for children in hospital a creative approach to deal with any changes in their body can be crucial to developing a positive perception of the self. This construction of ourselves through the body is also related to the Global self, as explained below.

In this research, I refer to Healey’s depiction of body self-perception. Children from middle childhood have a clear sense of what their body looks like (Harter, 2012). This body self-perception construction can be influenced by social-cultural values, media, education and personal relationships (Healey, 2008). Furthermore, Gibson (1952) adds that “the perception of one’s own bodily posture depends on perceived space”. In other words, a child’s bodily perception is created through the way children experience reality that encompasses the environment where they are (the hospital). Gibson (1952) when talking about proprioception and the perceived space (framework) asserts that “not only the perception of the position of object but also the perception of one’s own bodily posture depend[s] on this framework”.

When we look at our body, the image that we project of ourselves is created by our consciousness, and the emotions that we receive at that moment transform into feelings with memories of our body that we have from the past. There is a continuous flow of action and reaction between our bodies and our minds. From a
phenomenological point of view, we could assert that our bodily self-perception is created by the way we perceive reality, which also creates memories: “what we store up as memories is not images of things we perceived at one time. Rather we store up the earlier perceptions themselves. We store up the perceptions we once lived through. (...) That is why memories can be so nostalgic. They are not just reminders, they are the activity of reliving” (Sokolowski, 1999, p. 68).

This is important, as explained previously, because our body images and memories are crucial for the construction of our daily body perception. Taking this into account, creating play that develops positive and creative perceptions of the body could help children to reinforce and develop a more creative perception of the self.

Changing the way we approach our body creates a different experience as well as the emotions and feelings that arise from it. A different approach to our body self-perception from a more creative, funnier and humoristic point of view can sequentially create new experiences, new memories and different future projections of our body self-perception.

**The Global self**

Global self is the construction of the self in relation to the achievement and success of societal expectations, the development of personal relationships and the way that others perceive us (Harter, 2012). In middle childhood the global self is constructed through comparing oneself to other peers’ abilities and skills. It is in middle to late childhood (from 7 to 13 years old) when children develop the capacity to make distinctions between one’s real and one’s ideal self (Harter, 2012). I believe this becomes very important for sick children in hospital when comparing themselves with healthy peers and friends.
Nelson (2003) explains when talking about children in their middle childhood, the child’s cultural self changes during these years as the child adopts the standards and values of society. For example, the child’s perceptions of one’s attractiveness is strongly determined by cultural standards of appearance (Harter, 2012). This self is constructed in relation with others and it is called ‘global self’. I believe for hospitalised children, the hospital becomes a microcosm of society that can profoundly impact the development of the Me-self. As such, designing projects that interconnect family and other sick children’s positive relationship experiences while being in hospital can develop more positive future choices of the global self.

Furthermore, global self is found to relate to motor competence (Skinner & Piek, 2001). Motor competence seems to be an important determinant in the creation of children’s global perception of the self, as individuals are motivated to demonstrate competence (Harter 1987), and perception of competence is an important determinant of achievement-related behavior (Deci & Ryan, 2012). I therefore believe that both domain-specific and global perception of the self (Harter 1982, 1985) is found to relate to motor competence (Skinner & Piek, 2001).

Creating play that invites sick children whose motor competence has decreased to move – even if it is just going out from their room and sharing physical activities with their peers – can be essential in supporting the global self. As Vedul-Kjelsås et al.’s (2012) findings highlight, self-perception can strongly relate to both physical fitness and motor competence in children. Therefore, during the design, development and implementation of the workshops, physical differences or disabilities were approached from a creative way rather than approached as a limitation, for example, in the construction and development of the two digital games ‘Doctor Giggles’ and ‘X-Safari’, moving the avatars with the hand-glove was similarly engaging for both, able and non-able children, as well as playing
with the X-rays shadow puppets behind the shadow theatre made with a hospital bed sheet.

In conclusion, I have based my research on different theories relevant to the concept of the self: Self-esteem (the I-self and Me-self), body self-perception and the global self. These concepts support my project’s main aim to support the development of a positive sense of the self in sick children in hospital.
3. Related work

Many hospitals have recently implemented play and art therapy programs as complementary care for sick children in hospitals (Hart & Rollins, 2011) given that hospitals environments and medical procedures can be very stressful for children: “Medical procedures cause anxiety, fear, and behavioural distress for children and their families, which may intensify their pain and interfere with the procedure” (Hart & Rollins, 2011).

In this chapter I am presenting different previous complementary care projects that aim to help sick children to develop a more positive sense of the self as they have informed my research. In particular, I was inspired by projects that use play, art and movement therapy as well as interactive media so I will focus what I learned from these.

Play

In recent years, play therapy has been highly valued in hospital environments because of its potential to normalise, educate, and facilitate communication between children and adults (Stagnitti & Cooper, 2009). This becomes important for families in hospital, where the possibilities and capabilities of playing together are reduced. As Webb explains: “We know that family functioning contributes to the functioning of ill children and that children do best when their parents are doing well” (Webb, 2007, p. 205).

Webb explains, when talking about children with cancer, that “siblings are the sometimes forgotten witnesses and survivors of cancer. They often feel vulnerable, jealous, guilty and worried, and with this fear of the ill sibling’s dying, a sense of heightened responsibility” (Webb, 2007, p. 205). When the sick child
and their siblings play together, it helps to construct an equal and positive relationship between the healthy siblings and the ill child. Including healthy siblings in the path of recovery can relieve feelings of being ignored or guilty.

Play is important for the achievement of healthy mental and physical development in children. As Koller and Gryski explain when talking about Piaget’s studies, it is through play that children can acquire motor and mental development (Koller & Gryski, 2008). As a result, health practitioners and health sciences in general are now more and more interested in the development of sick children’s emotional health through play; they have looked into different projects and ways to achieve a more personal and humanised therapeutic and hospital experience, especially for sick children in hospital (Hendon & Bohon, 2007). These therapeutic play programs aim to assist children in managing the emotional and physical impact of being a sick child in hospital: “If a child is admitted into hospital it is important that their play is not left behind. [...] Play facilitates comprehension, enhances coping and provides emotional support for children undergoing medical procedures” (Stagnitti & Cooper, 2009). For instance, the ChildLife Program (2012) utilises play to help children cope with the emotional and physical changes caused by medical procedures. Other programs such as Payasospital (2012) Therapeutic Clowns (Koller & Gryski, 2008) and the Clown Doctors programs (2011) aim to address the issue of being a sick child in hospital through magic, props and physical play. Clown Doctors (2011) is an organisation that uses puppets and props combined with clowning, acting and play to bring laughter and play to hospitalised children all around the world (Koller & Gryski, 2008). The Clown Doctors provide children with the opportunity to control the play and their environment; in doing so, children can feel more in control. This empowers children to participate and reinforces their self-esteem (Koller & Gryski, 2008). Furthermore, studies suggest that clowns performing with children requiring surgery can be effective for managing children’s anxiety (Stagnitti & Cooper, 2009). Also Koller and Grisky (2008) showed that play can be very effective for managing children’s anxiety produced by the hospital environment.
Throughout my project, I expanded the Clown Doctors’ ideas and techniques. For example, the Clown Doctors inspired me to design plays with puppets that the children have made themselves. I also performed as a clown character during the workshops: I approached the children and ran the workshops in an entertaining way to facilitate communication and the development of play during medical treatment sessions and different departments in the hospital as suggested by the Clown Doctors.

In summary, these prior projects demonstrate the importance of using play to help children cope with the experience of being in hospital. They also demonstrate the importance of bringing back children’s feelings of control and ownership through play. However, I identified a missed opportunity when it comes to looking at the development of play workshops that involve more than one child at a time and aim to develop children’s perception of the self.

**Art and movement therapy**

I decided to combine play therapy and art therapy throughout puppetry and performative play, allowing and encouraging children to use both in the creation of physical and digital play. In doing so, I allowed children to develop small performative pieces and poetry stories as part of their play. Play therapy and art therapy converge in “their natural appeal to children and their healing qualities of creativity, spontaneous expression, make-believe, and non-threatening, developmentally appropriate communication” (Malchiodi, 1999, p. 22).

According to Judith Aron Rubin (2005) Art therapy offers a way of overcoming the frustration, terror and isolation that emotional experiences such as trauma, stress, or depression may engender. “It provides an alternative medium for expression and communication through which feelings might be conveyed and understood” (Rubin, 2005, p. 45).
Art therapy emerged in the late 1940s (Botton & Armstrong, 2013). The American Art Therapy Association (AATA, 2014) defines art therapy as the therapeutic use of art making, within a professional relationship, by people who experience illness, trauma, or challenges in living, and by people who seek personal development. Through creating art and reflecting on the art products and processes, people can increase awareness of both self and the other; cope with symptoms, stress, and traumatic experiences; enhance cognitive abilities; and enjoy the life-affirming pleasures of making art (“AATA,” 2014). Art therapy does not rely on the artistic value of a final artwork but on the personal process of making it and the capacity of this process to be used as a healing tool.

In hospitals where sick children are more vulnerable and more dependent, Art therapy can provide opportunities for children to function independently as well as to be more active and social. It also provides the opportunity to represent emotions in an abstract level through symbolic representations (Rubin, 2005). I used the works developed in the Art therapy workshops for the development of digital games as an expressive platform for children.

Art therapy typically utilises visual arts to further emotional, cognitive, physical and social integration of the individual; this is based on the premise that body, mind and spirit are interconnected (Botton & Armstrong, 2013). For example, the Art2Healing Project (2014) is a creative arts therapy organisation based in Asia that provides emotional support through creative arts therapies to women and children who are victims of trauma. Other organisations, such as Associazione Phillipo Astori (2014) run art therapy programs in their orphanage, Hisani Orphanage in Tanzania, where artists are invited to develop artistic therapeutic projects with children in order to help them reinforce their self-esteem and express their feelings through artistic expressions such as dance, painting, singing, movement, etc. I visited the orphanage in 2013 as visiting artist and developed puppetry workshops made with surrounding rubbish to help children to reimagine and rebuild their home environment and reinforce their self-esteem. From this
experience I learned that the integration of the physical, emotional and social aspects of children becomes very important also for hospitalised children who, due to physical changes caused by illness and medical procedures, can isolate themselves and suffer severe decreases of self-esteem (Larouche & Chin-Peuckert, 2006). According to Rubin (2005), hospitalized children can find art therapy an opportunity to organise their thinking and a chance to express and cope with powerful feelings. Many hospitals all around the world such as the Royal Children’s Hospital (2014), St. Louise Children’s Hospital (2014) and UC Davis Children’s Hospital (2014) run art therapy programs as a complementary care for sick children to distract them from their hospital experience. However, I believe that trying to utilise the hospital experience as a source for creating therapeutic play that increases children’s positive perception of this experience is an area with also much potential but is yet to be explored.

Movement therapy programs, such as the Autism Movement Therapy Organization (2013) and OneHealth Organization (2013) are based on movement like Dance Movement Therapy (Goodill, 2005) and Theatre Therapy (Walsh, 2013). The Autism Movement Therapy Organization has been developed as an expressive tool for helping autistic children and adults to address emotional and physical issues. The OneHealth Organization movement therapy program explores personal and collective stories using dance and movement to approach processing trauma. Since the 1950s, therapists, doctors and health practitioners have recognised the emotional and physical benefits of Dance Movement Therapy (DMT) as an “alternative” medicine (“American Dance Therapy Association,” 2012). Recently, many hospitals around the world have developed DMT projects based on the Laban technique (Newlove & Dalby, 2011). Also Bio-dance (D’alencar, Mendes, Jorge, & X, 2008), Creative Dance (Meekums, 2002) or Five Rhythms (Meekums, 2002), are used as complementary care for patients.
I learnt from these programs the importance of using visual arts and movement to help children express themselves in hospital. In doing so, I believe children can develop a more creative perception of the self, which in turn can hopefully support a more positive perception of the self. However, I found a gap in our understanding when it comes to drawing from both types of therapies, art and movement, at the same time. I believe mixing both through creative play workshops could help sick children have a more enriching experiences of being in hospital and develop their sense of the self at the same time. Therefore, I decided to combine different techniques – such as puppetry, theatre movement and visual art – in the development of my project.

**Interactive media**

Children find digital technology a very familiar media (Pykhtina et al., 2012) and engagement with this media provides them with a joyful and creative platform to explore their imagination (Calvillo-Gamez & Cairns, 2008). According to Gold et al., hospitalised children can also find emotional and physical relief through virtual reality (Gold, Kim, Kant, Joseph, & Rizzo, 2006). Furthermore, many organisations such as Juegaterapia (2013) supply digital games consoles to sick children to alleviate their stress and anxiety. There are also some digital games designed specifically for sick children, such as “Operation IBD” (Waters, Oore, Shepherd, Abouzied, Cox, Kellar, Kharrazi, Liu, & Otley, 2006), “Bronkie the Bronchiasaurus” (Knauf, 1996) and “Glucoboy” (Slater, 2005) that aim to help children manage, understand and monitor their treatment (Waters et al., 2006). These projects focus on treatments. They assert that games for sick children can be welcomed and useful as complementary care (Waters et al., 2006). These prior works around interactive media inspired me to believe that digital play could also be beneficial for my project. However, they do not allow for co-designing the experience, which I believe is a missed opportunity to contribute to children’s sense of ownership and control of their own hospital experience. In particular, I
see an opportunity to combine play workshops and digital games to create digital play experiences for hospitalised children.

Extending the work on digital play, tangible objects (physical objects combined with digital interactive potential), have recently been designed to support complementary care. As Hornecker and Buur explain “Designing tangible interfaces requires not only designing the digital but also the physical, and their interrelations within hybrid ensembles, as well as designing new types of interaction that can be characterized as full-body, haptic, and spatial – new challenges for design and HCI” (Hornecker & Buur, 2006, p.1). For example, Waters et al. suggest that combining digital media with physical objects could be used for emotional and physical recovery treatment (Waters et al., 2006). Another example is “Elements”: “Elements” by Duckworth et al. (2007) is an interactive tabletop that supports rehabilitation of patients recovering from traumatic brain injury. “Elements” encourages and supports upper limb motor recovery by painting, creating music, matching objects and shapes using physical objects in a digital environment. Khut’s works (2014) utilise the body itself to play and create interactive and participatory experiences in hospital. For instance, “BrightHearts Project” (Khut, Morrow, & Watanabe, 2013) is an application that uses biofeedback to help sick children relax and manage the pain and anxiety experienced during medical procedures. “The Heart Library Project” (Khut, Loke, et al., 2013) is an interactive art exhibition for hospital and health care settings, schools, museums and art galleries that combines interactive heart-rate controlled audio-visuals with audience participation in order to relax patients and visitors. Yet another example is Magic Land (Pykhtina et al., 2012): it is an interactive tabletop that combines four different toys implemented on a smart table to help children understand and overcome feelings of anxiety. The following games demonstrate how the system enables a wide range of different activities to support complementary care: “Flying Feathers” supports imagination, “Rosebush” supports play, “Hero/Avatar” supports fantasy playing and “Water” supports new
play opportunities. These works suggest that combined digital and physical interactive objects can support therapeutic play (Pykhtina et al., 2012). However, these projects examine pre-made play objects given to the children as toys. I see an opportunity to allow children to co-design their play experiences around digital technology and interactive media in order to allow for play related to physical interaction to emerge.

In conclusion, I have presented a number of projects and works that I draw from. Many of these projects borrow from the arts and utilise technology to help children to improve their emotional and physical health. Inspired by them, I focused on how to use arts – especially theatre, puppetry and interactive media – to support the development of a positive perception of the self.
4. My Approach

My approach consisted of looking at my previous work as an artist and performer in order to find ways to develop and conduct two workshops using two digital games I designed for sick children in hospital. Therefore, the core idea behind the workshops was to allow the children to create their own puppets that are used within the digital games. I also analysed these artefacts, through observations, notes, and questionnaires. Furthermore, I analysed the workshops in order to derive insights for future workshops. I begin by explaining my design methods.

4.1 Design methods

The design methods consisted of designing two digital games that could be later changed with the children’s own creations, such as by the introduction of the children’s shadow puppets, graffiti names and children’s textures. I also used these two games in the workshops and then analysed the workshops to derive insights for future workshops as a way to help children.

4.2 Design goals

One of the goals of the project was to reinforce and reframe a positive and joyful child, family and hospital staff relationship through creativity and play. I identified four key concepts to achieve this goal: medical materials, hospital environment, medical task and sense of ownership and control. I received feedback of how to improve and design the games in order to achieve my design goals: reframing medical materials; reframing the hospital environment; reframing medical tasks, and reinforcing children’s ownership and control.
4.3 Design Approaches

As part of the workshops, I designed two digital games ‘Doctor Giggles’ and ‘X-Safari’. My design approach was informed by three key prior works: The notion of co-design (Druin, 1999) helped me particularly with what I call the ‘Implementation’, Jacques Lecoq’s theatre technique (2009) was particularly useful for the creation of the ‘Content’, and the notion of Desensitisation (Stagnitti & Cooper, 2009) helped situating the work with the ‘Context’ of the hospital environment. The workshops and games were implemented on two occasions and the responses of the children and their families of making the props used in the games and their experience of playing the games was recorded. This was then analysed in order to derive insights for others who want to create similar workshops.

In the next section, I will begin by contextualise my work within prior work on co-design, in particular the co-designing of play for children.

4.3.1 Implementation: Co-Design

Sanders (2005) defines co-design as “a collective creativity that applies across the whole span of a design process.” (Sanders & Stappers, 2005, p. 2) The authors use co-design to refer to the creativity of designers and people not trained in design that work together in the design development process (Sanders & Stappers, 2005). This is important when taking into account the participation of not only sick children but also their relatives and the hospital staff such as nurses, doctors, teachers, volunteers, etc. I decided to introduce parent participation into the workshops as a way to develop creative play experiences among the family in hospital rather than experiences of worry and seriousness. Play therapy (Stagnitti & Cooper, 2009), as explained in the previous chapter, is the use of play as an emotional therapeutic tool. Many healthcare professionals use play therapy to help sick children to cope with hospitalization and medical procedures (Goodman,
2007). Co-designing play with the family and the hospital staff, as conceived by Sanders, represented a perfect method to achieve this goal.

Allowing children to become co-designers of their own hospital experience can provide sick children with a better sense of ownership and control of their experiences (Shanhe & Zhihua, 2011). Co-design can stimulate children’s imaginations and bring back a sense of control and ownership of themselves and their environment. For sick children, who might also suffer isolation, it provides a platform for socialisation and sharing. Children naturally want to be with other children (Hendon & Bohon, 2007). As a result I decided to utilize co-design as part of the workshops in order to achieve a sense of ownership while reframing the children’s time at the hospital into a more creative positive experience.

As Druin (2002) suggests when talking about designing interactive technologies with children, I first defined a target age group from 7 to 12 years old (middle childhood) in order to understand the appropriate psychological developmental level, technological skills, knowledge and expectations of this age group. I selected this group as my previous teaching experience provided me with an understanding of the experience and skills of this age group.

During the design and development of the project, I created different co-design sessions with children, other designers and researchers in order to develop the first prototypes for the puppets as well as the pilot digital game ‘Laughter Three’, which turned into the games used in the workshops: ‘Doctor Giggles’ and ‘X-Safari’. Prior to the work in the hospital, I worked with four children in order to create puppets as examples for the children in hospital. I also worked with other artists and designers to create the digital games. We had seven informal meetings in which we discussed and developed different ideas. Furthermore, I presented the development of the games and the puppets in different sessions and workshops to peers and other researchers at the Exertion Games Lab (2012) at RMIT.
University. I also presented and tested the digital games with five children to assist in my decisions on the final designs. As co-design implies long periods of development, my intention with the children was to focus on their suggestions and propositions for using physical play engagement. Also, by creating with them the physical props I attempted to allow children to be co-designers.

I also aimed to involve children in the design of the digital games, even though digital games require specialist skills and long development cycles. For example, the quote “Technology can work as a bridge and a catalyst for children interacting with each other. […] Children want to share, show, and use technologies with others.” (Druin, 2002) inspired me: I saw an opportunity to asked children to help me to create some of the textures in one of the games, ‘X-Safari’. I also presented the game design prototype to other colleagues, researchers and game designers who provided ideas and suggestions.

Once in the hospital, during the co-design creative play workshops, children and family members created their own puppets and other forms of artistic expression such as graffiti with the medical equipment. They also wrote some poems with me about their puppets. These puppets, graffiti, and poems were scanned and introduced in the digital games as part of the games themselves so that other children could see them and play with them. These co-design workshops aimed to help the children to appropriate and reinforce feelings of ownership of the medical equipment and the hospital environment while increasing children’s self-esteem.

I also note that co-design, as suggested by Hendler and Druin (2000), advocates that children participate as much as they can from the beginning of the process so they can play the role of informers, users, testers and partners. However, when working with children in hospital one has to deal with often unexpected factors such as new treatment tasks or health issues that might prevent the flow of a traditional design session. In order to work with children from the beginning of the project, I first approached and co-designed with healthy children and brought
the early versions of the digital games to the hospital to finish them with sick children. The hospital environment required a different approach than when working with healthy children. Sick children in hospital undergo medical and treatment tasks and are surrounded by an environment that can be both stressful and frightening. Hence, designing for sick children in hospital requires the development of different co-design approaches in order to match the challenges that the hospital’s experience demands. For instance, simple and short-term design activities were conducted with adaptability and changeability in mind to support the child’s needs.

### 4.3.2 Content: Jacques Lecoq’s Theatre Technique

Jacques Lecoq’s theatre technique (2006) is a physical theatre and movement technique created and developed by the actor and mime Jacques Lecoq (Murray, 2013). Influenced by Antonin Artaud (2012) and Jean-Louis Barrault (1974), his technique encourages actors to investigate performance and movement rather than giving them instruction to play (Sherman, 2010). For example, with the work of the “Neutral Mask”, the actor uses a mask with no facial expressions in order to represent with his/her body the character’s journey. Actors can also use props for representing things, but these objects cannot be used in a naturalistic way. This technique nurtures creativity and exploration and is based on the power of failure for the achievement of success. This in turn draws from Lecoq’s “auto-cours” (Sherman, 2010). The auto-cours are workshops that provide students with the opportunity to make discoveries based on the structured improvisations and technique of their classes (Sherman, 2010). Lecoq wrote that the intention of the auto-cours is to “ensure that we never lose sight of the main goal of the school: creativity” (Sherman, 2010, p. 92). The auto-cours rely on the idea that ‘failure’ is success, so it opens new ways to change, experiment and adapt. As Martin (2004) explains, the “failure to fulfil the assignment’s requirements opened up another world, and this was where Lecoq turned our interest” (Sherman, 2010, p. 91).
Lecoq’s pedagogy is more a training in adaptation and wonder than instructions of skills. In other words, during the auto-cours, knowledge is not transmitted but found (Sherman, 2010).

As an actor trained in Jacques Lecoq’s technique, I found that the concept of the auto-cours and failure as a way to succeed could be helpful to develop play with sick children. Based on adaptability, change and different perspectives of ‘failure’, this method could help the children look at their own reality – the condition of being sick in hospital – from a more open, positive and creative perspective. Participants could look at reality from a more phenomenological perspective, or what Merleau-Ponty describes as ‘perceptual faith’ (Merleau-Ponty, 2005). Merleau-Ponty (1964) termed perceptual faith as a stance that prefers observation to judgment and collects impressions rather than prescribing values to concepts. Central to perceptual faith is a commitment to ambiguity and a kind of reflection that the philosopher Renaud Barbaras (1997) calls an “astonishment before the world”. By coupling the imperative for creation in the ‘auto-cours’ with Merleau-Ponty’s endorsement of ambiguity in perception, the children could better embody a practice that involves the creative power of failure and incompleteness.

I decided to use a theatre technique as a design approach because of the inter-relationship between theatre and pretend play. In pretend play, as in theatre, the real and pretend situations are kept separate. There are two different worlds in pretend play: one layered over and projected onto the other (Lillard, 1993). Theatre technique also involve features found in pretend play such as: the actor or pretender; reality; a mental representation that is different from reality and exits within the same space and time; and the awareness on the part of the pretender of components. These features are also found in digital games, where the player pretends to be another one, an avatar, and even experiences feelings produced during the play that create a different representation of the self in a safe and comfortable space (Lazaro, 2004). I found it very convenient when working with sick children in hospital to construct a different but parallel world of the children’s
reality. Pretend play and Jacques Lecoq’s technique share the potential of representing different characters of one self. To pretend to be another person, as it happens with avatars in digital environments, seems to involve representing the internal life of that person as well as the person’s external qualities: “To play another character well, one must represent the world as that person represents it. Some studies have found significant positive correlations between frequency of dramatic play and such skills as perspective-taking, cooperativeness, and social competence” (Lillard, 1993, p. 352). Hence, utilizing Jaques’ Lecoq technique I could facilitate the development of other representation of the self for sick children in hospital.

4.3.3 **Context: Desensitisation**

Desensitisation (Rubin, 2005), as described in Art therapy (Botton & Armstrong, 2013), refers to the presentation and use of a frightening object or task so that it becomes less stressful (Rubin, 2005). Dorland (2012) explains that desensitisation is the presentation of the feared object in a way that it becomes non-threatening. Through the use of different medical, psychological and play therapy techniques (Stagnitti & Cooper, 2009), a child in hospital can familiarise her/himself with the object and in response have a less emotionally disturbing relationship with the object or task in question (Malchiodi, 2013).

**Desensiitization goals**

I utilised three alternative therapies as strategies to implement desensitisation so as to achieve three goals: to reframe the medical equipment; to reframe the hospital environment; and to reframe the hospital tasks. In doing so, I aimed to transform sick children’s hospital experiences into a more positive, creative and joyful experience.
Fig. 1. Mock-up puppets created by me as examples for the children. Upper puppets are the medical equipment. X-rays shadows from human bodies were used to create inner decorations for the puppets rather than just recycled X-rays materials.

In conclusion, I have explained my design approach used for the design of the workshops. In the next section I will present the results of the workshops at the Hospital Sant Joan de Déu of Barcelona (Spain) (2012) and the Hospital La Fe in Valencia (Spain) (2012).
5. The Workshops

In this section I will discuss the creation of the pilot game ‘Laughter Tree’, and the subsequent development of the games ‘Doctor Giggles’ and ‘X-Safari’ that were implemented in the Hospital Sant Joan de Déu (Barcelona, Spain) and Hospital de La Fe (Valencia, Spain).

5.1 Objectives

My main workshop goal was to reframe the experience of being a sick child in hospital into a more positive experience. In order to achieve this main goal, I identified four objectives: re-framing medical equipment, hospital environments and medical tasks while reinforcing children’s sense of ownership and control.

Objective 1: Reframing medical equipment

As medical equipment are the objects that surround the sick children’s daily life in hospital, I looked for opportunities to utilise the medical equipment as creative material. By re-purposing these materials for playful and creative experiences rather than serious ones, the intention was to facilitate a more positive development of the self.

Objective 2: Reframing the hospital environment

As the hospital environment also affects the children’s daily life in, I looked at opportunities to reframe the space into a more playful and creative one. By utilising the puppets as decoration for the children’s rooms and the hospital areas, the children were given the opportunity to transform the hospital environment into a playful area.
**Objective 3: Reframing medical tasks**

In order to achieve a more playful experience of being sick in hospital, I aimed to reframe the experience of undertaking medical treatment and tasks into more creative and entertaining ones. I ran the workshops in specialist treatment departments such as demo-dialysis while the children were undergoing treatment and utilised medical material such as cotton and gloves that are normally used by the nurses during the demo-dialysis task.

**Objective 4: Reinforcing children’s sense of ownership and control**

With the workshops I aimed to reinforce children’s sense of ownership and control of the experience of being sick in hospital. For instance, running the workshops during medical tasks such as demo-dialysis and in department where play among children is rarely developed, such as in a psychiatric department, I aimed to offer children the opportunity to feel that they could control the situation as they were the owners of the play experience and the developers of the games.

### 5.2 Design process

As I have explained briefly in the previous section, I created mock-up shadow puppets and hand-glove puppets made from medical equipment to experiment with the hospital materials and show examples to the sick children. As part of the exploration, I asked healthy children to participate and co-design puppets with me to see if the design approaches worked. These co-design activities confirmed the chosen design approach. Participants responded creatively in the use of the medical materials and found the activity joyful and fun.

I also used Art therapy as a design approach to develop the shadow puppet and hand-glove puppet workshops using medical objects in order to achieve desensitisation. I first explored and created puppets made out of medical equipment to familiarise myself with the equipment. I created shadow puppets
made out of X-rays sheets and hand puppets made out of medical gloves, cotton, bandages, Band-Aids and medical tape. These mock-ups were used as examples to show to the children during the workshops.

One example is depicted in the picture above (Fig. 2): during the development and associated play I noticed that the child was mirroring his puppet’s movements and behaviour. He imagined he was a lion and started physically embodying the lion’s power through his body, moving his arms and hands up and down, roaring, attacking and feeling empowered. The child was reframing his bodily perception through bodily performative play, transforming his body into a new one full of power.

5.2.1 **Laughter Tree**

During this exploratory period, I teamed up with a programmer, Christopher Mackenzie, a sound designer, Courtney Blackney, and a graphic designer, Yue Yue Mo, to create a Kinect game called ‘Laughter Tree’ based on a laughter therapy activity. The game was created with the Unity 3D software (Unity Technologies, 2012) and played with the Kinect (Microsoft, 2012) and a computer attached to a big screen. The game’s interface displays a tree made with the
images of human hands and arms entwined together to create the tree’s trunk and branches. This tree drops leaves that need to be pushed up into the branches again. It is a two-player game that engages participants’ upper and lower limbs’ movements. Participants have to push up as many leaves as they can before they fall to the ground. Each time a participant pushes a leaf up, it triggers a different laughter sound from the sounds library. The game was created based on a laughter therapy activity and on the assumption that listening to laughter triggers laughing, thus enriching the emotional and physical well-being throughout stimulated and contagious laughter (Mora-Ripoll, 2011). Throughout this game, I explored the combination of physical performative movement and laughter therapy to encourage children to move their upper limbs in order to trigger the tree leaves’ laughter sounds.

In the development process, we presented the game to researchers and game developers in the Exertion Games Lab who advised us on the creation of the final prototype before the game was trialled with two children and their parents.

Fig. 3. ‘Laughter Tree’ player engaged in upper limb movement.
5.2.2 Doctor Giggles

Based on the previous laughter idea developed in ‘Laughter Tree’, I decided to explore the potential of looking at the hospital objects, hospital environment and hospital tasks from a different and more playful perspective in the development of ‘Doctor Giggles’. In doing so, I experimented with the idea of changing roles and reframing the hospital space using tools, the hospital environment and the hospital tasks. I found that the digital platform allowed me to construct parallel hospital task realities as well as combining it with the shadow puppets and graffiti names created from X-rays sheets and made by the children.

The shadow puppets and graffiti names

The shadow puppets and graffiti names were made out of X-ray sheets taken from other hospitalised children from different hospitals. I collected the X-ray sheets from friends and children’ relatives who decided to collaborate in the project. Children used these X-rays as well as some from them and their relatives that were not used anymore in order to create the puppets and the graffiti names. Graffiti names were designed and drawn on the X-rays sheets and cut out. Children utilised the X-rays sheet human body organs and bones figures to decorate the inside of the puppets. With the spare X-ray materials they created the
graffiti names (see Fig. 17, p.50). Changing the purpose of the X-rays and create them after, before or in between medical tasks such as demo-dialysis treatment or X-ray sessions was aimed to help the children develop a more creative and positive experience of being in hospital as well as a more playful sense of the self.

This game was initiated and driven by me for the purpose of my research. The assistance I received related purely to technical development and the graphic design of the project. Ultimately, however, the decisions were mine, although I sought and listened to feedback.

I created the starting game screen in the form of a virtual hospital waiting room with different virtual doctor characters waiting to get into the operation room. Once you press on one of the characters, a waiting room doors opens and displays a second screen: the operating room (Fig. 5). In this operating room, there is the doctor character the player has chosen, dressed in children’s pyjamas and jumping up and down around the room. In this operating room there is a big bed in the middle, a big operating light lamp, one table with medical tools and an X-ray machine. The aim of the game is to make the doctor laugh as much as possible by
utilising different tools from the table. It is an exploratory game where children can change the environment with the lights, see their X-ray animals coming out from the X-ray machine and utilise the medical tools to make the doctor laugh. To see the children’s shadow puppets jumping around the screen, children scanned them to put them inside a library data so the shadow puppets could appear when clicking on the virtual X-ray machine. Every time children click on the X-ray machine, an X-ray animal shadow puppets or a graffiti name pops up (by random from the library data). I also utilised different sounds from medical machines to create the tools’ sounds. The operation consists of a laughter therapy session rather than a medical one where the medical tools are different to their regular function. For example: scissors made from feathers that tickle rather than cut; a syringe magic wand that changes the colour of the room’s lighting to a variety of different hues; and a gas mask perfume that relaxes the main character, a child with an hospital gown but the face of a doctor from an hospital ( as if he was a patient). I decided to swap the roles so that the real patient (the sick child) was the player, the one in control, while the main character (with the face of a real doctor), could be a ‘patient’. This strategy was aimed to reinforce the child’s sense of ownership and control.

Fig. 6. Main character in the game, the doctor as patient.
In addition, I created a digital X-ray machine in the game’s operation room where children, as explained before, could scan in their own physical shadow puppets and play with them afterwards in the digital game. When children touch the X-ray machine, the X-ray shadow puppets pop up and, if the children click on them on the screen, they make silly and absurd sounds. In doing so, I hoped to reframe the image of the task of taking X-rays into a more creative and playful one. I also presented the game to three children before going to the hospital.

![Fig. 7. Kinect and touchscreen versions of the Doctor Giggles prototype.](image)

I presented the final prototype at The Convergence Conference at the Design Hub at RMIT University in 2013. Seven children and fourteen adults played the game. The children reported that they enjoyed exploring and playing the game. After this presentation I declared the prototype of ‘Doctor Giggles’ finished to be presented and implemented in the hospitals.
Fig. 8. Children playing Doctor Giggles at ‘Convergence Conference’ 2013.

Fig. 9. Children playing ‘Doctor Giggles’ at the hospital Sant Joan de Deu (Spain).
5.2.3 **X-Safari**

‘X-Safari’ is a game based on the idea of encouraging hand and upper limb movement for children with disabilities or motor problems such as cerebral palsy or brain strokes. In order to explore combining physical and digital play, I used a hand-glove (which could be covered by the hand glove puppets made by the children) as the device to move the avatar and a little horse in a 3D fantasy world of the digital game.

I created this world in Unity 3D and matched the avatar movement to different sensors using an Arduino. I used an accelerometer and a gyroscope to determine the avatar’s angle and speed.

![Fig. 10. Child playing ‘X-Safari’ and matching glove movement with the avatar.](image)
Based on the possibilities of moving a digital avatar with the puppets made by the children, I continued exploring how to create a device that could be used by all children. I ended up with the idea of a hand glove with embedded sensors.

Fig. 11. ‘X-Safari’ at the Hospital San Joan de Deu.

Fig. 12. ‘Hand-Sensor Glove’ for X-Safari.

Fig. 13. Child playing with X-Safari.
In the final ‘X-Safari’ version the virtual avatar, a horse, is controlled by the ‘Hand-Sensor Glove’ to move around an island to find ten different animals; these animals, made from X-rays sheets, were created by the children. First, I created the X-rays animals and later, I substituted them during one workshop by those made by the children. I scanned the X-rays animals made by the children and introduced them into the game. Them I substituted the previous ones by the ones from the children. The ‘Hand-Sensor Glove’ uses sensors attached to the glove’s fingers and another sensor attached to the palm part of the glove in order to control the avatar. When children move their fingers in a walking fashion the avatar on the screen moves. By tilting their entire hand, the child controls in which direction the horse goes. The idea is for participants to explore the island and its fantasy environment utilising their hand movement. Also, during the creative play workshops, I created poems with the children about their hand-glove puppets and scanned the poems into the game so other children could read them while exploring the island.
6. Evaluation

The goal was to evaluate the workshops and see if they achieved the objectives: reframing medical equipment, reframing the hospital environment, reframing medical tasks and reinforcing children’s sense of ownership and control. The initial intention of the project was to conduct the workshops in the Royal Children’s Hospital in Melbourne, Australia. However, due to changes in the hospital’s oncology department staff, it was difficult to develop it at the Royal Children’s Hospital. Therefore, the workshops were conducted in two hospitals in Spain. Two workshops were conducted in two different hospitals: La Fe (Valencia, Spain) and Sant Joan de Déu (Barcelona, Spain). This project got Ethics approval on the 4th of February 2012. Approval number is: Chean B-2000688-05/12. In this chapter I present the workshops and how I evaluated them.

I developed the play workshops in different spaces. At Hospital La Fe I visited the Educational department (the school room), Oncology department (going from one room to the other room), Psychology department and Demo-dialysis Department (space for treatment). At Hospital Saint Joan de Déu in Barcelona I visited the volunteer department (volunteer room). This is relevant as different departments and spaces posed different challenges to run the workshops. For example, developing the workshops during medical treatments (as in a demo-dialysis department) allowed me to explore how to reframe medical tasks. Individual sessions as part of the larger workshops with each child or family, room by room in an Oncology department allowed me to explore how to reframe the hospital environment and how to encourage the sense of ownership and control. Working in the volunteer department allowed me to run a workshop with four different families and children at the same time and in doing so it helped me to explore the interrelationships created during the workshop.
6.1 Demographics

Participants were invited to a workshop where the children as well as any relatives could create shadow puppets and hand-glove puppets together and utilise them in two digital games: ‘Doctor Giggles’ and ‘X-Safari’. 23 children and 17 family relatives participated. The main age of the children was between 7 to 10 years old. Typical diseases were different types of cancer and motor-neurological diseases. Most of the relatives where children’s parents and siblings. In one workshop also a grandmother and an aunt participated. The workshop lasted for three hours, with the exception of the short sessions in oncology department (thirty minutes in each room) and demo-dialysis treatment session (one hour).

Fig. 15. Families at the play workshops in Hospital Sant Joan de Déu.
I invited all sick children in-patients from 7 to 13 years old and sent each child an invitation in both hospitals. Those children who wanted to participate and obtained permission from their doctors or nurses and families participated in the workshops. I recruited a total of 23 children. Among them, 11 participated only in the creation of the puppets. 12 children participated in the creation of the puppets and played the games. Participants were in hospital for different medical issues and reasons. I ran the workshops in two sessions in each hospital. In the first day workshop children created X-rays shadows puppets and played with ‘Doctor Giggles’. Second day workshop participants created hand puppets and played the game ‘X-Safari’. Sometimes children had to leave the workshop early to address medical issues or treatments.
6.2 Data gathering methods

Photographs, videos, notes, questionnaires and interviews were used to document and evaluate the workshops. In restricted departments, such as oncology and demo-dialysis, videos and photographs were not allowed. Also, digital devices, such as computers, tablets and mobile phones, were forbidden so I could only develop the physical puppet workshops there. Furthermore, five children had to leave the play activities sessions early because of treatment and medical issues. As a result, I decided to rely primarily on the observational methods and secondarily on the questionnaires.

Interviews and questionnaires were used individually at the end of the workshops. When children or family relatives had to leave early, I encouraged them to come back later in order to get their feedback and to fill out the questionnaires. I also respected those participants and relatives who wanted to participate in the workshops but were not interested in the questionnaires or in being interviewed. Eleven questionnaires were filled out. I interviewed seventeen children and five parents.

At the end of each workshop and play session, as suggested by Allison Druin (1999), I also took notes based on what happened during the activities.

6.3 Questionnaires

Immediately at the end of the workshop I asked the children if they would fill out a questionnaire with three questions and a list of words labelling various emotions from which they had to choose five in order to help them to identify and express their emotions as suggested by some primary education expert and peers. I selected some words from the work made by the Children Center of University of California (2009). Questionnaire sheets are included in the appendix. The interview questions were structured to be brief and aimed to use appropriate
language for children. The words depicting emotions were selected from a list of emotional words used in primary school (Children Center of University of California, 2009).

6.5 Interviews

In addition, I asked each child if she/he wanted to share more information about their experience. Interviews lasted around five minutes. Children felt awkward most of the times so I decided to take notes rather than record them. I recorded three interviews with a camera and took notes of 8 interviews. The interviews were relaxed and I asked them to tell me about their experience during the workshop. Children answered they felt relaxed, happy, had fun, feel ‘normal’, and enjoy making puppets with medical equipment with other friends and their family’s relatives. I also analysed the interview data comparing the answers with the questionnaire responses in order to identify emerging patterns.
7. Findings

I now present the findings from the workshops. The key findings are assembled into three design themes to be considered when designing workshops for sick children in hospital to support the development of a positive sense of self. The three design themes are: bodily auto-topography, bodily creative communication and bodily representation. These themes were derived from the analysis of the artefacts, through observations, notes, and questionnaires.

7.1 Analysis of the findings

Findings were analysed through the artefacts, observations, notes, and questionnaires.

7.1.1 Artefacts

Children and family members created different artefacts made out of medical equipment. These artefacts were shadow puppets, graffiti names and glove puppets. The children also looked at and asked for medical equipment as artistic materials rather than medical ones and played with their puppets in departments, such as demo-dialysis, where play and joy is rarely seen.

Shadow puppets

There were a total of 21 shadow puppets made with X-ray sheet materials representing animals. The most represented animals were: lions, giraffes, elephants, crocodiles, kangaroos and monkeys.
**Graffiti names**

There were a total of ten graffiti art names all made by X-rays sheets. Names were: ‘Lucia’, ‘Juan Carlos’, ‘Alba’, ‘Manuel’, ‘Simon’, ‘Angela’, ‘Carmesina’, ‘Pau’, ‘Mohamed’ and ‘Johanna’.

![Graffiti examples](image)

Fig. 17. X-rays shadow puppets and X-ray graffiti names made by the children.

**Hand Glove Puppets**

Glove puppets were made with operation gloves, cotton, bandages, Band-Aids, medical tape and paints. There were a total of 26 glove puppets. Most of the glove puppets had humanized bodies and represented characters. In fact, three families and children created portraits of themselves and, also, representations of two hospital staff members.
Fig. 18. Hand glove puppets made by the children. From up to down, from right to left: backer, nanny, child-patient and clown, nun-nurse, pirate, dragon, monster, vampire and child-patient.

After collecting the artefacts, I examined the shadow puppets, graffiti names and hand glove puppets in order to find characteristics that could help me identify
specific design patterns. I examined the artefacts by myself and looked for similarities and differences between all of them. I also looked at the way these artefacts were used and the positive consequences of the creation process. This allowed me to define a set of design themes: bodily auto-topography, bodily creative communication and bodily representation.

7.1.2 Notes

At the end of each workshop I took notes. Later, I looked at the notes and tried to group them into logical clusters. The key clusters were:

1. Sick children in hospital are normally more tired and shy than healthy children. One note from the workshop I wrote down to my notebook was “Today Isabel got slept because her cancer medical treatment”. I found that designing physical play for children needs to take this into account.

2. Children enjoyed the physical activities. “However Isabel did not want to leave the workshop. She was having a lot of fun, playing with her puppet, a lion, and playing the ‘Doctor Giggles’ game”. Even though children could feel tired they love moving during play.

3. Children did not want to go back to their private hospital’s room. “Maribel did not want to go back to her room after the workshop, she said she wanted to stay longer and do another monkey for her brother”. Children enjoy playing activities around the hospital, out of their specific rooms.

4. Design workshops and play activities became a platform for communication between children and relatives. “Children asked their parents questions to design the hand puppets better”. “Four children helped their parents today to
create the hand puppets”. Children felt under control of the situation and also felt powerful when helping the other, rather than being helped.

5. Children related to the medical equipment in a more positive and creative way than in a normal treatment session. “Today in demo-dialysis, Abdul asked for more bandages to create the tale for his dolphin, his hand puppet. “I want more bandages for my dolphin!” while laughing and having treatment on his right arm”. Children felt the owners of the medical equipment and free to manipulate it in a playful way.

6. Developing a workshop in a hospital environment is more difficult because three participants had to leave prior to finishing the activities, interviews and questionnaires. “Isabel was so tired because of the demo-dialysis treatment that two nurses had to pick her up to bring her back to her room”. This is important to have into account when thinking about designing workshop activities for sick children that require physical activity.

7. Relatives responded positively and were engaged with the activities. “Today three relatives were so excited and enthusiastic that after the workshop tasks they asked me when it will be the next one”. “After the workshop two mothers approached me to thank me and congratulated me for the workshop”. Workshops could be also very helpful for relatives’ emotional health.

8. Relatives sometimes felt relieved during the activities. “During the session as part of the workshop in the oncology department, a father told me in the room that this activity had been very relaxing for him. Also, looking at her daughter enjoying so much, was very enriching and beautiful”. Playing together (children and relatives) could relieve the whole family stress and also enrich their relationship.
9. Families communicated and interacted with each other. “Today, during the workshop, seven adults from four different families, were talking about the puppets. They laughed and even sometimes helped to each other to make them”. Family’ relatives were able to communicate and talk to other family’ relatives in a creative and positive way rather than talking about the children’s sickness or family problems.

10. Children made jokes with each other. “Maribel and Elena were making jokes about Elena’s lion shadow puppets ‘Leo the lion’”. Workshops can increase children’s positive relationship.

11. Some nurses and hospital staff become involved in the activities. “Three nurses helped me to develop and run the workshop in demo-dialysis”. Activities can increase and develop a more positive relationship between children and medical staff.

12. Some nurses felt uncomfortable with the amount of extra work involved in developing the activities during medical treatments. “One of the nurses in demo-dialysis complained about the workshop because children were much more excited than usual and machines for the treatment had to be readjusted several times because children movements”. Workshops can facilitate play and joy during treatments but also demand more work and attention from the nurses.

7.1.3 Questionnaires

Children reported enjoying the co-design shadow puppet and hand puppet part of the workshops more than playing the digital games. However, they reported being engaged with the digital game when they could see and manipulate their own shadow puppets and graffiti names in the digital play of ‘Doctor Giggles’. I got
this information from the questionnaire responses that answered the question of “what did you enjoy most from the workshop, and why?” In ‘X-Safari’ they explained that they liked to move the avatar with the hand-glove because even though it was difficult it was different and challenging.

Eight children reported in the questionnaires that during the workshops they felt: creative, intelligent, active, had fun, were relaxed and felt powerful and positive. Eight tickled to feel powerful, positive, active, fun and creative. Five included to feel as well intelligent. Three also added to feel relaxed.

7.2 Where the goals achieved?

My main goal was to develop the self. In other to achieve this goal I targeted four minor goals for this project. These minor goals were: reframing medical equipment; reframing the hospital environment; reframing medical tasks and reinforcing children’s ownership and control of the experience of being a sick patient in hospital.

I will show that the analysis of the collected data demonstrates that these goals were achieved.

7.2.1 Reframing medical equipment

Children reported that they liked making the shadow puppets and the puppets with medical equipment. When asking children about the experience of making the puppets, most of the children explained they found the materials “nice” and “different”: “I like them because they are funny and because we have used things from the hospital” (Pilar, 12); “Yes, I liked them because it was very interesting to use the bones from people to make shadow puppets” (Maribel, 12); “Yes, because we were making them with things from the hospital and it is very different” (Elena, 13). Furthermore, they saw the medical equipment as a
material to create puppets rather than a doctor’s document, a report or a device symbolic of illness, disease or trauma. For instance, when one of the girls was taken off to undergo an X-ray session during the workshop, one of the children exclaimed: “Ask for the X-rays for the puppets!”

These comments suggest that the goal of “reframing medical equipment” was achieved. Children saw this approach to medical materials as a creative, positive and fun experience rather than a scary or traumatic one.

Also, in the game ‘Doctor Giggles’, children liked the syringe magic wand but one did not understand the gas mask, which he thought was perfume rather than the intended interpretation of an anaesthetic. During the play sessions, I noticed that children were interested in exploring the way that hospital tools were used in the digital game, which was different that the way they are usually used in a real operation room. These hospital tools were: scissors, gas mask, X-ray machine, syringe, and IV-Drip. This also demonstrated that reframing the medical tools into the digital games were successful. The digital game allowed them to link different meanings and sensations to the medical tools. For example, the IV-Drip was used to pop up little hearts rather than to apply medical treatment; scissors tickled the doctor and made him laugh; the X-ray machine displayed funny animals and graffiti names rather than taking body images; the gas mask relaxed the doctor with little pink bubbles and the syringe changed the operation room to light colour illumination. This remained true even when, as in the case of the gas mask, these mental and imaginary links were different, as I expected, as the case of the child who did not understand the usability of the gas mask and confused it with perfume.
7.2.2  **Reframing the Hospital Environment**

Children used the shadow puppets and their graffiti names to decorate their rooms. The idea of designing and making the graffiti names made by X-ray sheets was suggested by the children. I saw this as an opportunity to help them to reinforce the sense of the self. As a result, I introduced them in the game ‘Doctor Giggles’. Furthermore, the children utilised the graffiti names to put them on as pins on their cloths. In addition, they used them as presents for relatives, friends and medical staff. “I’ve shown my giraffe puppet to my brother and he really liked it. He studies visual arts. We have put it in my bedroom.” (Maribel, 12). Other children put them on wheelchairs or on their IV-Drip to carry them around the hospital.

![Children carrying their puppets and reframing the hospital environment.](image)

Furthermore, children found the graphic design and the second screen of ‘Doctor Giggles’ to be fun and engaging: “It is like a room for operations but it is a little bit crazy.. Haha... It is fun.” (Maribel, 12). They reported enjoying the fact that the main character (patient) was an adult little doctor rather than a child: “Look, he is an adult!” (Javier, 7). The other children liked and laughed at this comment. Also, they commented that they liked changing the colour of the lights in the operation room the most and two children spent around five
minutes popping the hearts with kissing sounds coming from the IV-Drip of the game.

This suggests that the goal of “reframing the hospital environment” was achieved.

7.2.3 **Reframing medical tasks**

While making the puppets, the children experienced lots of excitement. Also, during stressful and painful treatment such as demo-dialysis, making the artefacts while receiving the demo-dialysis treatment helped them to feel more relaxed during the session. For example: a seven year old child started clapping his hands and shouting “Party, party! Yes, yes, let’s do puppets!” (Abdul, 7).

When playing Doctor Giggles, children reported that they liked the X-ray machine because it was “silly” and they saw puppets coming out from the “crazy” digital X-ray machine while making silly noises.

This suggested to me that the children reframe their medical procedures and tasks such as X-ray sessions or demo-dialysis.

7.2.4 **Reinforcing sense of ownership and control**

Eight children embodied the behaviour of some of the animals or figures they created. For example, Javier, while playing with his puppet, a “Vampire”, was trying to bite me while shouting and laughing.

Also, playing with the digital game ‘Doctor Giggles’ helped to reinforce children’s self-esteem and control by operating on a doctor rather than a child. Children laughed and made comments about the fact that they were manipulating an adult. At the same time, creating and working with the family helped children
and their relatives feel surrounded by a more positive and healthier environment: “And also, to be able to do open activities, out of the room [...] so siblings can come. Because many times siblings don’t know how to feel [...] they don’t understand. This is a way to make things much more personal and easy going [...] I like it very much [...] everything [...] all the activities we did” (Marta, Pablo’s mother). Furthermore, seven children reported in the questionnaires about their feelings during the workshops and the play activities that they felt “powerful”.

This suggested to me that the goal “reinforcing sense of ownership and control” was achieved.

7.3 Additional Findings

I will now report additional findings. Most of the findings were positive findings suggesting that the workshops were a success. The findings also suggested that the children also became more physically active. Further findings related to body movement, positive body awareness and body representations of children, reinforcing positive self and reinforcing the global self.

7.3.1 Positive Findings

I found 29 positive findings that I grouped in five groups.

Body Movement

F5. Children carried the characters around with them. In doing so, they utilizing them as toys, thus they could project on them personal and emotional understandings of the self.
F16. Children were more physically active during medical treatments, such as demo-dialysis. This might have helped children to develop a more positive relationship with their body perception of the self.

F17. Parents saw the play as an opportunity to help the children leave the room and move around. This helped parents to encourage their children to relate to their bodies in a more positive way and therefore develop the children’s ownership and control of the body.

F18. Children encouraged themselves to be more active and participatory. In doing so, children developed a more positively relationship to the body perception of the self; a higher sense of bodily control and ownership and a positive sense of the I-self and the Me-self. All of these resulted in a more positive sense of the global self as well.

F21. Children reported to like playing ‘X-safari’ because they moved the avatar with their body using the hand-glove. In doing so, children reinforced the bodily perception of the self and the I-self.

**Body Representations**

F1. Children and their family’s artworks always represented characters. This means that they might have developed different representations of reality, such as medical equipment, projected on them humanized characteristics and feelings.

F12. The sick children and their families talked about the body puppets and communicated with each other about creating family portraits together during the creative co-design play workshops. Creating family portraits might have therefore enforced the children’ sense of their body representation while enforcing the global sense as well as the Me-self.
F27. Children and parents named the puppets to represent their new ‘family body puppets’, allowing children to reinforce the sense of the global self and the Me-self as well.

**Positive Body Awareness**

F2. Children and relative’s character artefacts often had anthropomorphic bodies. So, if children created ‘bodies’ it could mean there were thinking about their bodies during the workshops. Hence, this is an indicator that the workshops helped the children to develop their sense of the body perception of the self.

F15. Children had fun during medical treatments like demo-dialysis. This helped children to reinforce the sense of control and ownership not only of their body but also of the medical treatment.

F20. Children enjoyed playing with the little hearts in Doctor Giggles (the kisses) and listening to the laughs (emotional awards), when emotional reactions were triggered. This helped children to develop a more positive connection with bodily emotions and to develop a positive sense of their body perception.

**Reinforcing the sense of self**

F3. Children used the character they have created as gifts. This means that they could have felt proud of the creation, intensifying positively their self-esteem.

F4. Children used the characters as decorations. As they liked these characters, they enjoyed extending these new representations of the self into their own rooms and in doing so they might have changed the experience of being sick in hospital into a more positive and personal experience.
F7. Children helped their parents create the puppets (changing roles). This means that children could have felt useful again and experience feelings of being proud, suggesting a development of a more positive sense of the self.

F8. Parents took pictures of the children during and after the workshops and the play activities. This could have helped the children to feel special and therefore reinforce a positive sense of self.

F11. Children made jokes about their creativity and their works. They were having fun and possibly projecting a positive sense of the self.

F19. Children reported that they found the digital play ‘Doctor Giggles’ more engaging when they could see their physical works inside the digital game than when they could not.

**Reinforcing global sense**

F9. Parents and medical staff sent photos of the play workshops and activities to the children’s friends, relatives and teachers. This could have enforced children’s sense of the global sense.

F6. Children made puppets of the hospital staff. Making puppets of nurses could have helped the children to see themselves on a similar level to the hospital staff.

F10. Children talked to each other more than usual. Children were enthusiastic about their artwork and enjoyed talking about their creations to each other. In doing so, they might have developed and shared with the other children a more positive and creative sense of the global self.
F13. Families met other families and talked about being creative and expressing themselves rather than talking about the condition of their child. In doing so the children’s families were helping reinforcing the children’s sense of the global self.

F14. The families had fun together playing with the body puppets. Having fun together playing with the body puppets helped might have helped the children to develop a more positive sense of the body perception and the global self, understanding the family as a micro-cosmos of the entire society.

F22. Children were very excited watching their works inside the games. They felt proud and developed a sense of ownership and control. Hence, they reinforced the sense of the Me-self and the global self.

F23. Children felt very proud watching their works inside the games. This reinforced children’s sense of control and ownership and hence developed a positive sense of the global self and the Me-self.

F24. Children asked for more medical equipment to do more puppets. Asking for medical materials, even though they were patients, represented a positive development of the ownership and control of the hospital experience. In doing so children reinforced their sense of the Me-self and the global self.

F25. Parents found the activities very creative for both, adults and children. Creativity among the family members allowed a funnier and richer experience of being in hospital as a family, and therefore developed the children’s sense of the global sense in a more positive and creative way.

F26. Parents found the activities necessary for both adults and children. This feeling represented a way to embrace the hospital experience in a more playful, relaxing and positive way. Giving the parents the opportunity to express their
needs might have helped the children to reinforce a positive sense of the global self.

F28. Children and parents shared spaces where they are not used to be together in a creative way such as in oncology rooms. That might have reinforced children’s sense of the global self.

F29. Parents found the activities a welcoming distraction from the worries of everyday life at the hospital and appreciated it. This appreciation could have helped the children to feel a more positive sense of the global self and the Me-self.

7.3.2  

Negative Findings.

Most findings were positive. However, four of them, which were related to technical issues and medical staff’s comments, were negative.

F30. Some medical treatments like demo-dialysis become more difficult for the nurses but more entertaining for the children: the children shouted and clapped, which made setting up procedures more difficult.

F31. Four children found the ‘X-Safari’ glove difficult to move.

F32. One child did not understand one of the tools in ‘Doctor Giggles’, the gas mask, so he felt confused.

F33. One child reported to not understand the final purpose of playing ‘Doctor Giggles’. I explained to him that it was just to have fun.
7.4 Group Findings

Once all the findings had been collected, I grouped them into three different groups. I analysed them using Strauss’ qualitative data analysis methodology (Strauss & Corbin, 1998). I grouped the data into three groups: bodily representation, bodily auto-topography, and bodily creative communication.

7.4.1 Bodily representation.

F1. Children and relatives’ (parents and siblings) artworks represented characters. They created family portraits.

F2. Children and relatives’ character artefacts had bodies.

F6. Children represented the hospital staff through the puppets. They made puppets of the hospital staff such as nurses.

7.4.2 Bodily auto-topography

F3. Children used the creative bodies as gifts.

F4. Children used the creative bodies as decorations.

F5. Children carried the creative bodies around with them.

7.4.3 Bodily creative communication

Making and moving

F12. The sick children and their families talked about the body puppets and communicated to each other about creating family portraits that they could keep together in order to play in their room or around the hospital.

F17. Parents saw an opportunity to help the children leave their hospital room and move around.
F21. Children reported to like playing ‘X-safari’ because they moved the avatar with their bodies using the hand-glove.

F18. Children encouraged themselves with words such as “wow, that is nice”, and helped each other (“Today, during the workshop Maribel was helping Angela to create her X-rays shadow, a monkey”) to be more active and participatory.

F16. Children were more than usually bodily engaged during demo-dialysis.

Sharing

F7. Children helped their parents to do the work (changing roles).

F8. Parents took pictures of the children during and after the play workshops and shared them with the family’s relatives from outside the hospital.

F9. Parents and medical staff sent photos of the workshops to children’s friends, relatives and teachers.

F10. Children talked to each other about the medical equipment and the activities in a creative and funny way. Teachers, volunteers and medical staff commented children were more talkative during the workshops than usual.

F11. Children made jokes about the creation of the puppets and laughed about each other’s puppets in a playful way.
F13. Families met other families and talked about being creative and expressing themselves rather than discussing the condition of their child.

F28. Children and hospital staff shared spaces that they are not allowed and used them to share together in a creative way such as in protected areas in the psychiatric department. For example, children could use tools and materials such as scissors, glue or X-rays sheets (which can cut) in a room where they are not usually allowed to touch or use any object.

**Motivation**

F14. Families had fun together in the room playing with the body puppets. This motivated the families to develop more puppets, come together to the second workshop and invited other families to play with them. This motivated them to be the active core of their own positive experience of being in hospital.

F19. As reported by the children in the questionnaires and interviews, children found the digital play ‘Doctor Giggles’ more engaging when they saw their physical works inside the digital game than when they were not.

F24. Children asked for more medical equipment in order to be able to create more puppets.

F25. Parents found the activities very creative for both adults and children.

F27. Children and parents named the puppets to represent their new ‘family body puppets’ as a new representation of themselves.

F30. Some medical treatments like demo-dialysis became more difficult for the nurses as they became more entertaining for the children: the children shouted and clapped because of excitement.
F29. Parents found the activities a welcoming distraction from the worries of everyday life at the hospital and appreciated it.

F20. Children enjoyed playing with the little hearts in ‘Doctor Giggles’ (the kisses) and listening to the laughs (emotional rewards), when emotional reactions were triggered.

F22. Children were very excited watching on the screen their X-ray shadow puppets and graffiti names inside the games. They clapped and shouted when after clicking the X-ray machines in the game, their creations popped up.

F23. I observed children feeling proud watching their works inside the games, which suggested to me this could help children to reinforce a sense of the self, control and ownership.

F15. Children had fun during medical treatments such as demo-dialysis. This was possible by running the workshop during the medical treatment session.
8. Discussion

In this chapter, I will discuss the key dimensions identified in the previous chapter. The three dimensions are: bodily representations, bodily autotopography, and bodily creative communication. I am also presenting a set of tactics to help designers and play therapists set up similar workshops when designing play for sick children in hospital to support the development of a positive sense of self.

8.1 The dimensions

In this section I explain the three dimensions: bodily representations, bodily autotopography, and bodily creative communication.

8.1.1 Bodily representations

This dimension was developed from children and their family’s creations of bodily anthropomorphic representations of themselves in the play workshops. These multiple representations worked as different and changeable representations of the self. In doing so, children and their families were creating and mirroring reality through art.

This dimension looks at the extent of the object relation of the self as a construction of multiple representations through bodily play that can support sick children and their families build a healthy construction of the self while reinforcing family communication.

The bodily representations throughout the creative process and artwork creation worked as metaphors of the self in different situations or environments. Children represented themselves as different animals through the X-ray shadow puppets
and different bodily entities through the hand-glove puppets. Allowing children and families to construct multiple representations enforces the concept of changeability and transformation. If everything is changeable and in constant movement, even the body, the representation of the ‘self’ relying on the perception of the body in a specific period of time and place is also ‘temporary’; it depends on the different emotional conditions of looking at the body at a specific time from a specific emotional perspective. Looking at reality, the body and the ‘self’ from a phenomenological perspective and a creative way can help sick children to emotionally understand that ‘being sick’ is a momentary and transformative state like everything else, and therefore, a condition that will change.

Working with bodily (anthropomorphic) representations can intensify this concept because children relate to anthropomorphic ‘humanised’ representations. In doing so, this confirms the theory that body perception is phenomenological, as Merleau-Ponty explains (Merleau-Ponty, 1964), and having changed the representation of children’s external body through an anthropomorphic puppet it could help to change children’s own body perception.

Furthermore, the key aspects of this dimension are: the family portraits and the children’s personification through physical artefacts. In the workshops the family and children created physical bodily representations that later on were introduced in the game and changed into virtual bodily representations. Both worked well in the project. However, the fact that the children made them with their own hands really helped them to create a strong sense of reshaping and reframing their own body perception of the self. Playing with them in both worlds, the physical and virtual, might have intensified this feeling.
8.1.2 Bodily auto-topography

This dimension was derived from the children’s use of the created artefacts as: a) gifts for friends, relatives and hospital staff; b) decorations for the hospital environment, and c) mementos (as souvenirs) of their daily life in the hospital. As Petrelli et al. (2014) suggest: “A memento is an object given or deliberately kept as reminder of a person, place or event” (Petrelli, Whittaker, & Brockmeier, 2008, p. 2). People use objects to construct a sense of themselves and, in doing so, they reframe and reconstruct the space.

Through auto-topography, children reshaped and reframed the hospital environment and consequently, altered the experience of being sick in hospital into a more personalised and appropriated space and experience. As a landscape, children utilised their works to beautify the environment and to expand it even outside the hospital walls. They were, in a way, expanding themselves.

The fact that most of the puppets and creations were anthropomorphic (given human characteristics) also supports the idea that children could construct and develop a playful ‘world’ in the hospital, where these new embodied creatures or entities colonised the space, changing children’s behaviour into a more creative and playful one while empowering them to own their hospital experience. According to Gonzalez (1993), the creation of an auto-topography is a form of self-representation. Hence, auto-topography can be understood as a spatial representation of identity. Utilising bodily auto-topography allows children to colonise and ‘appropriate’ the space with embodied creations that act as further projections of their inner world, a world where they are the ones who have both power and control.

This spatial representation of identity can be really important for sick children in hospital. As children, they are still developing their own perception of the self. Assisting them to build and relate to a comfortable, positive, creative and owned
space can help them to develop positive childhood memories and construct a healthier and stronger perception of the Me-self and the global self.

Furthermore, as Arlander (2012) suggests, ‘mobility’ represents an important site in the childhood auto-topographical spatial relation of the self. Mobility allows children to explore, investigate, know, and appropriate a space as their own. In doing so, it creates feelings of control and power. Creating artefacts that children can place down or take with them not only provides a never-ending transformation and appropriation of the environment but also can work as a ‘fellow toy’ that accompanies the child at all times. In a similar way, bodily representations can work as toys that children use to mirror themselves. Creating, placing and sharing bodily representations of themselves, families and medical staff both in and out of the hospital grounds can act as a metaphor for bodily transformations and bodily appropriation of the environment in everyday life activities. “Mementos were not only displayed and shared, but also integrated into everyday activities” (Petrelli, 2014, p. 3). These findings extend the theory of auto-topography as they confirmed how auto-topography being used for sick children in hospital could help these children to develop a healthier sense of the self, specifically the Me-self and the global self.

8.1.3 Bodily creative communication

This third dimension was derived from the participants’ body related communication during and after the workshops. This dimension looks at the extent to which creativity and bodily play through physical puppets, storytelling and digital play facilitated verbal and non-verbal communication between children, their family, relatives, and medical staff. This dimension expands the theory of communication into two contexts: Intrapersonal Communication and Interpersonal Communication.
**Intrapersonal Communication**

Intrapersonal Communication is communication with oneself and allows people to add attributions to themselves (West & Hunter, 2007). As Satir (1983) explains, these internal dialogues can help individuals reinforce their self. As presented before in the findings, children reported in the questionnaires to feel creative, intelligent, active, fun, relaxed, powerful and positive during the play workshops. They also reported about the importance of creating the puppets with other children’s X-ray body sheets and utilising their body to move them. These feelings reinforced children’s self-esteem and their bodily self-perception into a more creative and positive one. Also, during the play workshops, children, their families and hospital’s staff (including teachers, volunteers and nurses) commented about the importance of having creative play workshops not only for children but also for adults because it develops a more relaxed, happier, fresh and positive self-perception of being in hospital. This expands the theory of intrapersonal communication in terms of bodily communication (making the puppets and playing with them as one’s own representation) rather than just oral communication.

**Interpersonal Communication**

Interpersonal Communication refers to face-to-face communication (West & Turner, 2007). It explores the diversity and complexity of different kinds of relationships such as doctor-patient, parent-child, etc. Throughout the play workshops, findings confirm how the creation of bodily play through puppets and body movement, both in a physical and digital platform, facilitate the creation, development and reinforcement of a more positive, creative and healthier interpersonal communication between: a) children and children; b) children and family; c) children and hospital staff; d) different families; e) children to the outside world.
Fig. 20. Children playing together and communicating through bodily play with the X-ray shadow puppets at hospital San Joan de Deu.

8.2 Tactics

From the findings, I created a set of design tactics and categorized them under the previous three design dimensions: bodily representation, bodily auto-topography and bodily creative communication, to help designers and play therapists create and implement play workshops that develop a positive self for sick children in hospital.

8.2.1 Bodily representation tactics

These tactics support the idea of multiple bodily representations as a changeable and transformative extension of the self.

T1. Create and send a personal invitation for the workshops and play sessions to each sick child in hospital, so they feel personally invited and special. Children
reported in the interviews they liked the invitation. See the appendix for the invitation.

T2. Introduce the medical equipment, especially the X-rays sheet, globes and cotton, to the children.

T3. Start a brainstorming session with the children about the possibilities of creating different puppets from the medical equipment with the children.

T4. Run the workshops for a minimum of two sessions (on two different days) and between two to four hours, so sick children and relatives can participate in different and progressive activities and, if they need to leave, can return at any time.

T5. Approach the children and family relatives as the developers and owners of the project rather than being yourself the developer and owner of the workshop and games.

T6. Utilise the environment and the materials from the surroundings, in this case the hospital, to create and develop the workshops and the games.

T7. Ideally utilise the children’s X-ray sheets, so children could approach their own sense of body image from the beginning of the workshop, reinforcing ownership, control and the I-self.

T8. Utilise body movement as a performative way to express or to move an avatar.

T9. Create physical and digital play that interrelates and complements each other, such as puppets to move an avatar in a digital world or graffiti names and shadow puppets to personalise the experience.

T10. Create digital games that can be personalised and changed with the children’s artwork.
T11. Create body puppets than can be transformed or changed if possible, so children develop a better idea of changeability.

T12. Use the human body as the primary design source. Play with the idea of body movement and bodily expression; utilise body parts to design the games and the puppets. Refer to human body capabilities and creativity during the workshops.

T13. Create explorative digital play rather than competitive or achievement based play so children do not feel exposed or develop feelings of superiority and inferiority.

8.2.2 **Bodily auto-topography tactics**

These tactics describe the creation of gifts, decorations and mementos in hospital as a way to reframe positively the hospital environment, hospital tasks and the medical equipment.

T14. Run the workshop, if possible, during medical treatments such as demo-dialysis or X-ray sessions.

T15. Motivate families to create family portraits.

T16. Set up the physical and digital play installations in a way that facilitates playing creatively with all the activities at any time.

T17. Allow for times to take photos and recordings of the participants as a memento of the experience.

T18. Utilise the hospital environment as a physical and digital playground.
T19. Run the workshops in medical areas related to the materials, for example, an X-ray shadow puppet workshop in the X-ray session waiting room or hand-glove puppets before going to clinical examinations.

T20. Create body puppets big enough so they can become personal toys for the children to move around with.

T21. Create graffiti with the sick children’s names with medical equipment and put them inside the digital game.

T22. Create digital games that utilize the hospital environment, hospital materials and hospital tasks as a framework for the game.

8.2.3 **Bodily creative communication tactics**

These tactics facilitate verbal and bodily (non-verbal) communication between children, their family and relatives, and medical staff.

T25. Show mock-up puppets to provide inspirational ideas to the children to start the co-design workshops, so they do not feel blocked and shy.

T26. Run the workshops in areas where people are sitting together around a big table so families can interact with each other and intrapersonal communication is easier to emerge.

T27. Create emotional and physical humanized rewards in the digital games such as kisses, laughs, claps, and heartbeats, so children can relate them to interpersonal emotional communication and facilitate to develop the sense of the self.

T28. Create physical and digital play that facilitates changing roles, such as patients becoming doctors, adults becoming children, so children can develop a sense of ownership and control.
8.3 Limitations and Future Work

This section presents the limitations of the research project and also describes ways to address these limitations. These limitations are: 1) the lack of having tested the design dimensions with other designers, 2) no implementation of the tactics and hence no proof they are effective.

8.3.1 Testing the design dimensions with other designers

As a Master’s researcher, I created and implemented my own project. I derived three design dimensions as the key contribution. However, I could not test these new dimensions with other designers in order to demonstrate their usefulness. In response I encourage other designers to use these dimensions and examine if they are useful.

8.3.2 Implementing the tactics

I derived a set of tactics to use when creating, developing and implementing play workshops. While these tactics are theoretically useful, they are yet to be implemented in other projects. I will implement these tactics in my future projects and continue investigating them.
9. Conclusion

This exegesis presents the personal motivation, theoretical and related work background, design, development, findings, results and future projections of my two years of research. Throughout this research, I have been investigating, exploring, developing and running workshops (in both physical and digital formats) for sick children in hospital to examine how play can facilitate the development of a positive role of the self. I achieved my main objective: developing the sense of the self as well as my other four objectives: reframing medical material, reframing hospital environments, reframing medical tasks and reinforcing children’s sense of ownership and control of the experience of being in hospital. My findings resulted in three design dimensions to guide designers and play therapists in their own exploration of creating play workshops for sick children in hospital.

As an overview of the entire project, I would like to highlight the importance of utilising the sick children’s situation (hospital tasks, hospital environment, medical materials, hospital everyday life objects, hospital staff relationships, etc.) as a design source to develop play that could reframe children’s body perception and the condition of being sick into a transitional and creative state. In doing so, children can relate to and communicate with their self in a more positive and creative way. This attitude to approach their self has the potential to not only bring back children’s childhood happiness but also reinforce family bonds. I believe that supporting the development of emotional well-being could affect a quicker physical recovery. Also, I would like to acknowledge the need for further, evidence-based research into the efficacy of creative activities in complimentary care: it is required to ensure the continuation and increased support for such creative programs in hospitals.
Throughout this project I have presented a new approach to develop play that distinguishes it from previous approaches. Rather than trying to distract children and families from their reality, I have suggested immersing them in it through the creative, expressive and non-verbal communicative path the hospital experience and environment offers. In doing so, children and families could approach it as another experience in their life, rather than an experience of pain and suffering.

To conclude, I aim to inspire play designers and play therapists to further explore the interesting area that the condition of being sick in hospital represents for play research. I suggest exploring the hospital as a source of positive, creative and playful experiences and aim to reframe the hospital experience from a frightening, and stressful experience into an entertaining and creative playground.
Appendix

In this appendix I attached those relevant documents and information for my research such as the Ethics approval from RMIT University, the letters from the Spanish hospitals, the questionnaire, and the children’s invitation to the workshop.
Ethics Approval

RMIT University

College Human Ethics Advisory Network
Office of the Pro Vice-Chancellor

Phone: 9925-2974
Email: lisa.mann@rmit.edu.au

17 May 2012

Ms Ruth Sancho Huerza

Dear Ruth,

Ethics Clearance
Project title: Visual Poetry Installation for Children with Disabilities/Illness
Applicant: Ruth Sancho Huerza
Ethics register number: CHEAN B-2000688-05/12
Ethics clearance expires on: 16 May 2015

Your ethics application has been reviewed and approved by the Design and Social Context College Human Ethics Advisory Network (CHEAN). Your application has been approved at a Low Risk classification subject to the following condition:

1. You will provide the DSC CHEAN with a copy of your approval from The Royal Children’s Hospital Human Research Ethics Committee in due course.

Data storage
Please note that all research data should be stored on University Network systems. These systems provide high levels of manageable security and data integrity, can provide secure remote access, are backed on a regular basis and can provide Disaster Recover processes should a large scale incident occur. The use of portable devices such as CDs and memory sticks is valid for archiving, data transport where necessary and some works in progress. The authoritative copy of all current data should reside on appropriate network systems and the Principal Investigator is responsible for the retention and storage of the original data pertaining to the project for a minimum period of five years.

Annual/Final report
You are reminded that an Annual /Final report is mandatory and should be forwarded to the Ethics Officer in December 2012. This report is available at: http://www.rmit.edu.au/governance/committees/hrec

Amendments
If you need to make any amendments to your project please submit an amendment form to the Ethics Officer. This form is available at: http://www.rmit.edu.au/governance/committees/hrec

Should need any further information please contact the Ethics Officer, Lisa Mann on (03) 9925 2974 or email to lisa.mann@rmit.edu.au

On behalf of the DSC College Human Ethics Advisory Network I wish you well in your research.

Yours sincerely,

Lisa Mann
Ethics Officer
DSC College Human Ethics Advisory Network (CHEAN)
Letter of Approval from The Hospital La Fe of Valencia.

12/04/2013

To whom it might concern,

The Hospital La Fe (Valencia) is interested in hosting the digital poetry play installation created by Ruth Sancho Huerga as part of her Master by research in RMIT and is at Ruth Sancho Huerga disposed to conduct her research in our centre. Her research investigates the potential of play to help children to relieve the stress and develop a more positive and creative “SciP” perception. The Hospital La Fe in Valencia is also interested in facilitating and helping the setup of the installation in our hospital.

Yours Sincerely,

Anahi Ases Antelo
Coordinadora de la UPH La Fe
Letter of Approval from The Hospital Sant Joan de Deu of Barcelona.

12/04/2013

To whom it might concern,

The Hospital Sant Joan de Deu (Barcelona) is interested in hosting the Digital poetry play installation created by Ruth Sancho Huerga as part of her Master by research in RMIT and is at Ruth Sancho Huerga disposal to conduct her research in our centre. Her research investigates the potential of play to help children to relieve the stress and develop a more positive and creative 'Self' perception. The Hospital Sant Joan de Deu of Barcelona is also interested in facilitating and helping the setup of the installation in our hospital.

Yours Sincerely,

Alberta Porayko
Cap del Departament de Voluntaris
Hospital Sant Joan de Déu
Questionnaire for participants in the hospital workshop.

- What is your name?

- How old are you?

- Did you like making and playing with the X-rays shadow puppets and graffiti? Why? Explain please.

- Did you like making and playing with the hand-puppets made from medical equipment? Why? Explain please.

- Did you like the digital games ‘Doctor Giggles’ and ‘X-Safari’? Why?

- What did you like most from the workshop? Why?

- Please, choose five words to describe your feeling during the workshop.

  FUN       BORED       DIFFICULT       EASY       ACTIVE
  INTELLIGENT       COLLABORATIVE       SIMPLE       TIRED
  EXPRESSIVE       COMPLICATED       IMAGINATIVE       UNIQUE
  SURPRISED       POWERFUL       UNEXPRESSIVE       WEAK
  SPECIAL       STRONG

Now, try to use your own words to describe your feelings during the workshop:

THANK YOU!!!
Invitation sent to potential workshop participants in the hospital
References

Books & Articles


**URLs**


