

Fighting Fear of Blood test with Secret Powers: Using Game Design as a new method of inquiry in Design Research

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Non-verbal forms of interactions as found in play and gaming has not been investigated as a method that can actually communicate or express an emotional state. In this paper we are using the design of a computer game (called the Child Patient Game) designed especially for hospitalized children as Design Case. We are demonstrating how children's interaction with a computer game is used as a method for letting children express their emotions towards a hospital examination. In order to make sense of the different elements that constitute a Playful Experience this paper makes use of the Playful Experience Framework. This framework is an attempt to understand the emotions and experiences elicited by play; in this case the playful experience elicited by patients and non-patients playing the Child Patient game.

Keywords: Emotion driven design, Game design, Playful Experiences, Design Research, Research Through Design, Research Method, Design for Health, Interaction Design

0. Introduction

Gathering information about the emotions felt by paediatric patients during hospitalization is difficult, because children have different needs than adults and cannot always express and communicate these needs through verbal accounts. Developing methods suitable for children should be done by exploring other ways of communicating with the patient, than the traditional methods (e.g. questionnaires or interviews) designed for adults,

Using the design of a computer game as a method has great advantages that meets the shortcomings of the traditional methods: it is a visual, playful method for communicating, that invites children actively to participate and inform the clinical staff and researchers of their emotional life through expressions they understand so well: play and gaming. Moreover, the emergence of emotional approaches to design (Desmet, 2002; McDonagh et al., 2004; Norman 2004) suggests that playfulness and emotion driven design can play an important role as a medium for a non-verbal dialogue.

The aim of this paper is to demonstrate how children's interaction with a computer game is used as a method for letting children express their emotions towards a hospital examination. The questions we are pursuing are: What kind of playful experiences is emerging from the interaction between player and game? How are these experiences related to the emotional experiences in the real world? In order to make sense of the different elements that constitute a Playful Experience this paper makes use of the Playful Experience Framework PLEX (Arrasvuori, 2010). PLEX is an attempt to understand the emotions and experiences elicited by play.

Our argument is built up from a research-through-design method (Brandt & Binder, 2007; Redström, 2011) using the design of a computer game (called the Child Patient Game) designed especially for hospitalized children as research artefact. We will use the empirical findings from our inquiry to address the experiences emerging from the interaction between player and game. More specifically we will demonstrate how the five PLEX experience categories: Simulation, Sympathy, Nurture, Fantasy and Exploration together defines the core components, forming the particular patient-player experience related to the Child Patient game.

Our findings give a detailed picture of a patient-player experience in relation to emotion driven design. We are suggesting that fictional and counter-factual emotions should play a fare more critical role in the communication with patients and deserves to be explored on a larger scale. Our overall contribution concerns the development of a new method of inquiry in Design Research, that addresses felt and sensed emotions as

well as imaginative experiences. Further more, we contribute with a new visual method within Healthcare, for understanding small children's unique emotional experience of hospitalization, illness and treatment.

1. Using a Playful Approach in a Serious Context

1.1 Playfulness

Playfulness is in general a positive feeling motivated by fun (Apter, 1991) and can be seen as the attitude of a person when he or she is engaged mentally and physically in a state of play (Arrasvuori, 2010). Play is part of our human culture (Huizinga, 1938) and consists of many different activities, from formal forms of play with rules (like sports or board games) to not rule-based activities (like a bunch of kids playing "a game of war" in the woods).

In his article "Understanding Playfulness" Arrasvuori writes: "Any object can become a tool for play and any situation can be approached in a playful manner, when the person is in such frame of mind. A playful approach can be applied even to serious activities to make them more bearable or even enjoyable" (Arrasvuori, 2010).

Through gaming one can play with narrative structures, put new perspectives on identity or deal with social issues, as seen in ARG games (alternate reality games) that uses the real world as a platform and uses a mass medium to deliver the story. Games makes it possible to take a chance, embrace a challenge or even deal with painful matters because the player is in a "protective frame" free from the real consequences of ones actions (cf. Arrasvuori, 2010; Apter, 1991).

However, the fact that players operate in a protective frame does not necessarily mean that the player is detached from the real world. This is depended on how the game is designed and how the different elements that constitute a Playful Experience is related to the player.

1.2 The Child Patient game - a computer game for children in hospital

In this paper we are using a specific design case - and a specific research artefact to investigate how the different elements that constitute a Playful Experience is related to a specific target group: children who are in hospital and has deal with several uncomfortable and painful procedures (facing known or unknown diagnoses, medical examinations, feeling isolated or simply ill).

The research artefact we are using in our design case is a computer game called the Child Patient game which is developed by designer / researcher Eva Knutz in cooperation with the children ward and research unit at Kolding Hospital.

The Child Patient game (CPgame) is a computer game about a little child's journey through a healthcare system. The game is designed to allow hospitalized children to attach emotions [fig.1] and “secret powers” [fig.8] to an animated child figure, which is trying to cope with a hospital-situation, similar to that of a patient.

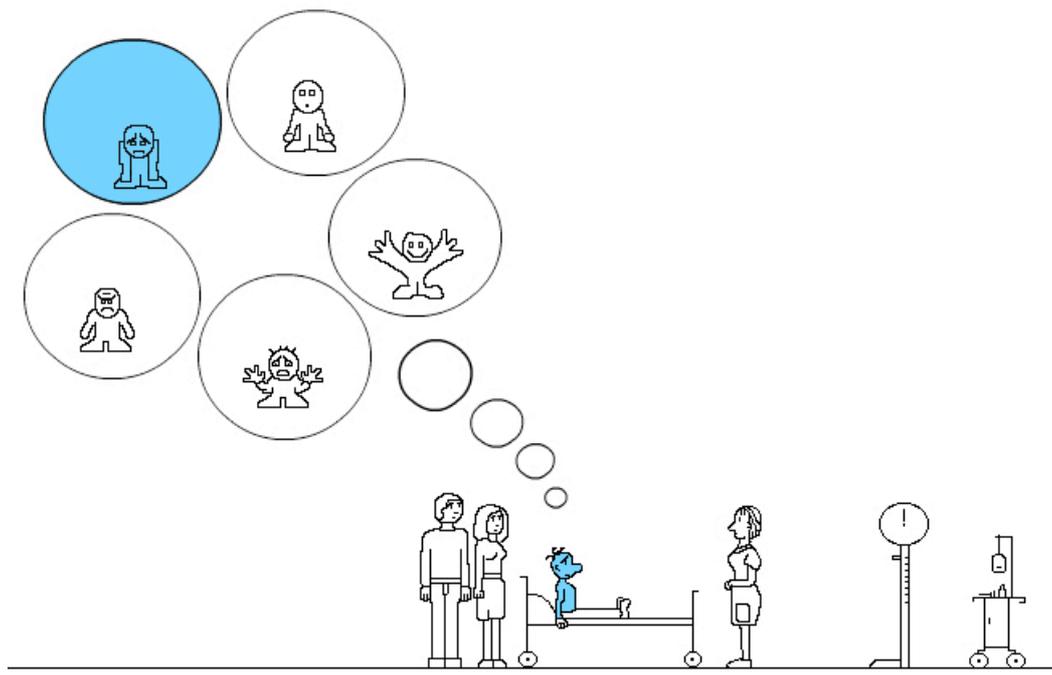


Fig.1: Screenshot from the CPgame (choosing emotion). © Knutz 2010.

The purpose of the CPgame has been to design a computer game environment for young patients (age 4-6) that can map emotional experiences - and hereby allow hospitalized children to inform staff and researchers about their emotional lives (Knutz & Markussen, 2010).

The CPgame raises the question as to whether fictional emotions chosen in the game relate to the children's own felt emotions during hospitalization? The CP game also raises the questions: Can play and gaming communicate an emotional state? What kind of playful experiences is evoked by the players and how are these related to the experiences in the real world? The method of inquiry, demonstrated in this paper is guided by exactly these questions.

1.3 Using game design as a method of inquiry

The design of CPgame is strongly shaped by a research through design method (Frayling, 1993; Archer, 1995; Brandt & Binder, 2007; Redström, 2011) meaning that the process of designing and making a research artefact as well as the testing of this research artefact is integrated in the method of inquiry. In our case, the CPgame is developed and designed as a research artefact, through which we conduct a research (Markussen, 2011)

The CPgame was tested at the children ward of Kolding Hospital from February 2011 until October 2011. The overall scope was to account for relation between Real Emotions (expressed by the child during hospitalization) and the Fictional Emotion - expressed by the child through the fictional world of the game (Knutz, 2011).

The test is done by letting a group of patients (children age 4-6) and a group of non-patients (children age 4-6) play the CPgame. The non-patient players just played the game - where as the patient-players played the game right after having had their medical examination.

During the medical examination (with the patient-players) and during the game session (with the patient-players and the non-patients-players) the emotional the states of the children were obtained, through observation (from staff), through ratings (from parents), through the database (of the CPgame) and through dialogs (between researcher and child). After the testing of the CPgame all the different sources of information were organized through visual mapping. Visual mapping is a way of structuring, organizing, arranging information. It is a non-linear method that makes it easier to see patterns, relationships, hierarchies and dependencies that might otherwise remain hidden. The outcome of our empirical investigation is the so-called "CPcards" (fig.2) presented in the next section

1.4 The outcome of our inquiry: the CPcards

To make sense of the relation between the "the real" and "the fictional" world making we invented the CPcards (figure below). For the sake of clarity, let us define "the real" and "the fictional" emotion, before we move on:

- Real Emotion is: the Emotional Experience towards a real situation (Walton, 1978)
- Fictional Emotion is: Emotional Experience towards a fictional situation (Walton, 1978)

The CPcards represents each player (patients and non-patients) playing the CPgame. Lets look at a CPcard of a patient-player:

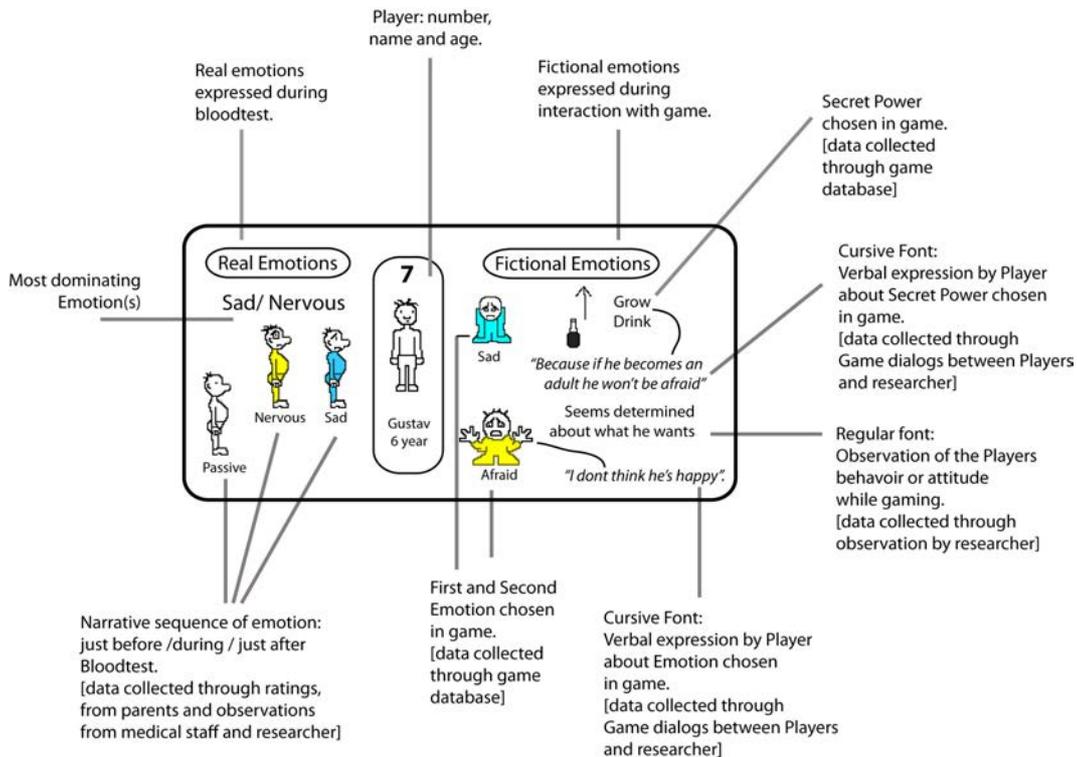


Fig 2: Visual mapping of information into CP card. © Knutz 2011.

The CPcard of a patient is divided into a left side, representing the real emotions - and a right side representing the fictional emotions. In the middle of the card we have the player of the CPgame. The colour indicates if there is a link between the emotions observed and rated by staff/parents (left side) and the emotions chosen by the player in the game (right side). The black lines from text to symbol (right side of the card) indicates if the verbal expression or observation is linked to a particular choice of Emotion or Secret Power. If there is no black line, it is a more general observation about the player's emotional state, attitude or way of playing.

The CPcard above gives us information about the patient "Gustav". The card tells us that Gustav's emotional state during the blood test (left side of card) evolved in sequence that can be described as Passive (just before b.t) to Nervous (during b.t) and to Sad (right after b.t). The right side of the card tells us that Gustav first chose the emotion "Sad" when the child figure (in the game) was hospitalized - and then "Afraid" when the child figure had to go into the blood test. Gustav gave the child figure a "grow-drink" - and explained that the reason for giving him such a power was

"because if he becomes an adult he wont be afraid" (quote Gustav). He also so expressed a reason for choosing "afraid" as fitting for the child figure: "I don't think he is happy" (quote Gustav).

Table 3 gives an overview of the CPcards of all the patients players. The 12 cards are organized in such way that the children who felt most anxious, insecure or uncomfortable during the blood test are placed at first (number 1) and the patients feeling at least anxious are placed at last (number 12).

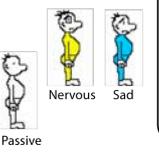
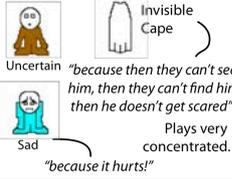
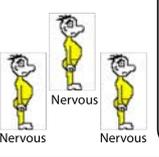
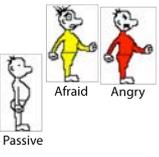
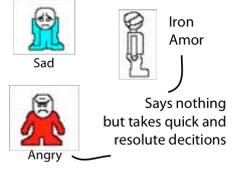
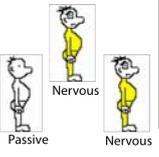
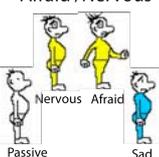
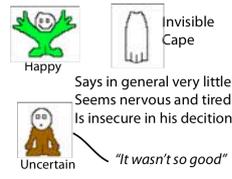
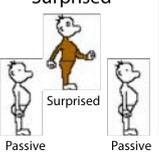
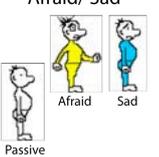
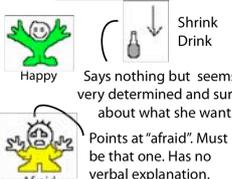
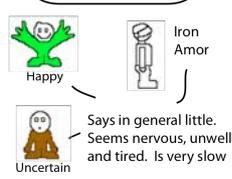
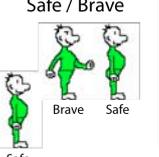
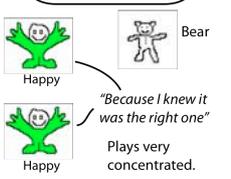
<p>Real Emotions Afraid / Angry</p> 	<p>1</p>  <p>Why? Invisible Cape "because he doesn't like it" Plays for a long time, tries everything out. "because he thinks its funny"</p>	<p>Real Emotions Sad/ Nervous</p> 	<p>7</p>  <p>Grow Drink "Because if he becomes an adult he won't be afraid" Seems determined about what he wants "I dont think he's happy."</p>
<p>Real Emotions Afraid / Angry</p> 	<p>2</p>  <p>Uncertain Invisible Cape "because then they can't see him, then they can't find him, then he doesn't get scared" Plays very concentrated. "because it hurts!"</p>	<p>Real Emotions Nervous</p> 	<p>8</p>  <p>Sad Bear "Because then he has someone to hug" Takes quick and resolute decisions "Because it hurts"</p>
<p>Real Emotions Afraid / Angry</p> 	<p>3</p>  <p>Sad Iron Amor Angry Says nothing but takes quick and resolute decisions</p>	<p>Real Emotions Nervous</p> 	<p>9</p>  <p>Sad Bear "beause then he has somebody to hug with" Seems sure of whats she wants "Sometimes you cry because it hurts"</p>
<p>Real Emotions Afraid / Nervous</p> 	<p>4</p>  <p>Happy Invisible Cape Says in general very little. Seems nervous and tired. Is insecure in his decisions. Uncertain "It wasn't so good"</p>	<p>Real Emotions Surprised</p> 	<p>10</p>  <p>Sad Bear Is very quiet. Seems unwell and tired, but is still very sure about what she wants Angry</p>
<p>Real Emotions Afraid / Sad</p> 	<p>5</p>  <p>Happy Shrink Drink Says nothing but seems very determined and sure about what she wants. Points at "afraid". Must be that one. Has no verbal explanation.</p>	<p>Real Emotions Nervous/ Brave</p> 	<p>11</p>  <p>Happy Grow Drink "Because you dont get sick so much" (if you are grown-up). Takes her time, is very communicative "Because I was also like that"</p>
<p>Real Emotions Afraid / Sad</p> 	<p>6</p>  <p>Happy Iron Amor Says in general little. Seems nervous, unwell, and tired. Is very slow Uncertain</p>	<p>Real Emotions Safe / Brave</p> 	<p>12</p>  <p>Happy Bear "Because I knew it was the right one" Plays very concentrated.</p>

Table 3: CPcards of all patients (7 girls, 5 boys) playing the CPgame. © Knutz 2011.

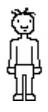
Table 4 (below) is based on the CPcards of the patients. It categorizes three different patient-player types: Player A, B and C.

<p>Player type A: Fictional emotion relates to Real emotion (player no. 2, 3, 7, 8, 9, 11, 12) Characteristics: Fictional emotion relates strongly to Real emotion. The player can express their imaginative experiences verbally as well as through gaming.</p>
<p>Player type B: Fictional emotion partly relates to Real emotion (player no. 4, 5, 6) Characteristics: Fictional emotions are different from their real emotions, but not entirely remote. The player can't (or wont) express their imaginative experiences verbally. Only through gaming.</p>
<p>Player type C: Fictional emotion is very remote to Real emotion (player no. 1, 10). Characteristics: Fictional emotions are completely different from their real emotions. The player can't (or wont) express their imaginative experiences verbally. Only through gaming.</p>

Table 4: Patient-player type A, B and C, in relation to the CPgame

Table 4 suggests that in most cases the players felt emotion (towards a real hospital situation) relates to the persons imaginary experiences with a fictive character (involved in a simulated hospital situation).

Table 5 (below) gives an overview of the CPcards of all the 12 non-patients players:

<p>13 Fictional Emotions  Emalie 5 year  Afraid  Iron Amor <i>"because it is a boy thing"</i> Takes choises without hesitating. <i>"it hurts very much"</i></p>	<p>19 Fictional Emotions  Alfred 6 year  Afraid  Angry  Grow Drink <i>"I want to be a grown-up because then I can better reach" (the other powers)</i> <i>"because it hurts."</i></p>
<p>14 Fictional Emotions  Caroline 5 year  Sad  Sad  Bear <i>"so he wont be afraid when he is being pricked (smiling)"</i> <i>"because its not very funny to be there and sleep there"</i> <i>"because it hurts!!"</i></p>	<p>20 Fictional Emotions  Line 5 year  Afraid  Afraid  Bear <i>"Because then he can hug it"</i> <i>"Because it might hurt a little bit to get pricked..."</i></p>
<p>15 Fictional Emotions  Matias 6 year  Afraid  Angry  Invisible Cape <i>"because then they cant see him, thats funny!" (he laughs)</i> <i>"because he (the figure) thinks its not funny!!" (he laughs again)</i></p>	<p>21 Fictional Emotions  Lars 5 year  Afraid  Afraid  Invisible Cape <i>"Because then you are invisible" (chooses right away)</i> Plays quiet and concentrated</p>

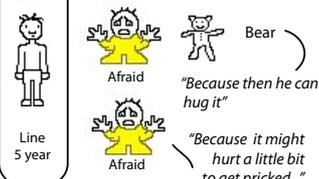
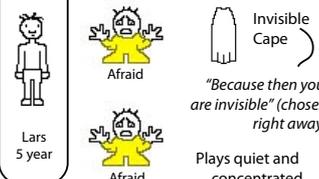
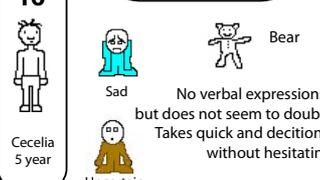
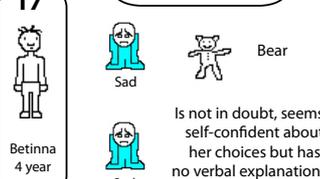
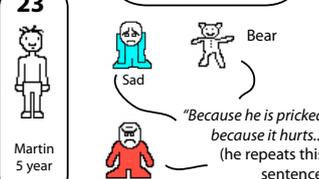
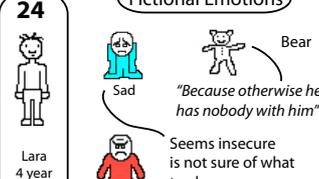
<p>13 Fictional Emotions</p>  <p>Emalie 5 year</p> <p>"because it is a boy thing"</p> <p>Takes choices without hesitating.</p> <p>"it hurts very much"</p>	<p>19 Fictional Emotions</p>  <p>Alfred 6 year</p> <p>"I want to be a grown-up because then I can better reach" (the other powers)</p> <p>"because it hurts."</p>
<p>14 Fictional Emotions</p>  <p>Caroline 5 year</p> <p>"so he wont be afraid when he is being pricked (smiling)"</p> <p>"because its not very funny to be there and sleep there"</p> <p>"because it hurts!!"</p>	<p>20 Fictional Emotions</p>  <p>Line 5 year</p> <p>"Because then he can hug it"</p> <p>"Because it might hurt a little bit to get pricked..."</p>
<p>15 Fictional Emotions</p>  <p>Matias 6 year</p> <p>"because then they cant see him, thats funny!" (he laughs)</p> <p>"because he (the figure) thinks its not funny!!" (he laughs again)</p>	<p>21 Fictional Emotions</p>  <p>Lars 5 year</p> <p>"Because then you are invisible" (chooses right away)</p> <p>Plays quiet and concentrated</p>
<p>16 Fictional Emotions</p>  <p>Cecelia 5 year</p> <p>No verbal expressions, but does not seem to doubt. Takes quick and decisions without hesitating</p>	<p>22 Fictional Emotions</p>  <p>Allan 5 year</p> <p>"He needs the bear!"</p> <p>"He must be like this!" (laughing)</p> <p>"I think he feels like this!"</p> <p>...Wauw! he is really afraid!</p>
<p>17 Fictional Emotions</p>  <p>Betinna 4 year</p> <p>Is not in doubt, seems self-confident about her choices but has no verbal explanation.</p>	<p>23 Fictional Emotions</p>  <p>Martin 5 year</p> <p>"Because he is pricked, because it hurts..." (he repeats this sentence)</p>
<p>18 Fictional Emotions</p>  <p>Simona 4 year</p> <p>"It must be the bear"</p> <p>Has only few verbal expressions. Takes decisions without hesitating</p>	<p>24 Fictional Emotions</p>  <p>Lara 4 year</p> <p>"Because otherwise he has nobody with him"</p> <p>Seems insecure is not sure of what to choose.</p>

Table 5: CPcards of all non-patients (7 girls, 5 boys) playing the CPgame. © Knutz 2012.

The CPcard of a non-patient player looks different. There is no "Real Emotion" (or felt emotion) in relation to the hospital situation - because they are not in a hospital situation. Most of these children did have a memory or an idea of how it "might be" to be in a hospital or to have a blood test, but these affective states were in most cases sentiments - and not (acute) emotions (Desmet, 2002). So the left side of the cards are

blank. The CPcards of the non-patients players are organized in chronological order; the first player that played the CPgame is number 13, the last player is number 24.

For every player (patient and non-patient) a CPcard has been made. This gives us a picture of how a child's felt emotion (towards a real hospital situation) relates to the child's imaginary experiences with a fictive character (in a fictive hospital situation). The CPcards also gives us information about several other issues, such as; how emotions may change and evolve over time, about the players motivation for choosing and about how certain kinds of knowledge is shared with others (e.g. expressed verbally) were as other sorts of knowledge is kept silent.

2. The Playful Experience Framework (PLEX)

2.1 In order to make sense of the different elements that constitute a Playful Experience this paper makes use of the revised Playful Experience Framework, PLEX (Arrasvuori, 2010). PLEX is an attempt to understand the emotions and experiences elicited by play; in this case the playful experience elicited by patients and non-patients playing the CPgame. Table 6 is the summary of the revised PLEX framework:

Experience category	Brief description: the Playful Experience emerges from...	Experience category	Brief description: the Playful Experience emerges from...
Captivation	Forgetting ones surroundings	Fellowship	Friendship, communality or intimacy
Challenge	Testing abilities in a demanding task	Humor	Fun, joy, amusement, jokes or gags
Competition	Contest with oneself or an opponent	Nurture	Taking care of oneself or others
Completion	Finishing a major task or reaching closure	Relaxation	Relief from bodily or mental work
Control	Dominating, commanding or regulating	Sensation	Excitement by stimulating senses
Cruelty	Causing mental or physical pain	Simulation	An imitation of everyday life
Discovery	Finding something new or unknown	Submission	Being part of a larger structure
Eroticism	A sexually arousing situation	Subversion	Breaking social rules and norms
Exploration	Investigating an object or situation	Suffering	Loss, frustration or anger
Expression	Manifesting oneself creatively	Sympathy	Sharing emotional feelings
Fantasy	An imagined situation	Thrill	Excitement derived from risk or danger

Table 6. Revised PLEX framework (Arrasvuori, 2010).

Of these 22 PLEX categories, we will address 5 experience categories emerging from the Child Patient game. These experience categories are: Simulation, Sympathy, Nurture, Fantasy and Exploration.

3. The particular Player Experience of Patients

3.1 Addressing playful experiences

We will demonstrate how the 5 PLEX categories: Simulation, Sympathy, Nurture, Fantasy and Exploration together defines the core components, forming the particular player experience related to the CPgame.

The Child Patient game is about a little child's journey through a healthcare system. This child figure is the main character that the player will follow and can control in the game. The player can attach certain Emotions to him (fig.1) or give him certain Secret Powers. (fig.8). Its about seeing "emotions" and "secret powers" as a set of reactions that the player can apply to the animation figure "as if they where him". It's about **Simulation** (being involved in an imitation of a real situation) and about **Sympathy** (the sense of being able to share emotional feelings with a virtual character). Here the experience of **Nurture** (taking care of this virtual character) can be interlinked with the experience of Sympathy. **Fantasy** and imaginary experiences is present in the Playful experiences emerging from the CPgame, because we are inviting children to take part (as players) in a game of make-believe (Walton, 1990) in which the players are acting in a fictional world that encourages imaginary experiences (Knutz, 2011). Finally the experience of **Exploration** involves investigating of an environment; like how the player interacts with the game play and finds the best, or most pleasurable, way to play the game and reach the goal. Also this experience is one of the components that define the playful experiences emerging from the CPgame.

In the next sections we will demonstrate and discuss how each of these experiences emerges - or manifests themselves in the interaction between player and CPgame, comparing two groups of players: Patients and non-Patients. We will use the outcome of our game inquiry and the empirical investigations (the CPcards as well as related diagrams) to support our demonstration.

3.2 Simulation

Simulation is the experience derived from being involved in an imitation of a real-world situation (Arrasvuori, 2010). The CPgame is simulating a child being hospitalized. A way to investigate how the player let them selves engaged in such game of make-belief is by investigating how a patients felt emotions towards a hospital situation relates to the play pattern and choices made in the simulated hospital world of the CP game. Table 4 suggests that in most cases the patients-players felt emotion relates to the patients-players imaginary experiences with a fictive character, involved in a simulated hospital situation.

By comparing the play pattern of the patient-players with the play pattern of the non-patient-players, we can detect several differences.

In the CPgame the player must attach one out of five emotions (3 negative, 1 positive and 1 less articulated) that the player thinks fits to the child figure in the game. The emotions are visualized as five animated characters, with five different colours. This action of game play results in the continuation of the story. For instance, if the player attaches the emotion "afraid" to the child figure in a particular situation, the child figure will become afraid. If the player thinks that "sadness" is more appropriate, the player can change emotion. When the player has arrived at the "right" emotion, the game can continue.

Diagram 7 gives us a picture of how the patient players and non-patient players chose emotions within the CPgame. The players could add an emotion twice in the game story; 1) when hospitalized and 2) just before the blood test. They could change the emotion as many times as they wanted, before making a final choice. The choices in diagram 7 are the final "emotion choice" the players made.

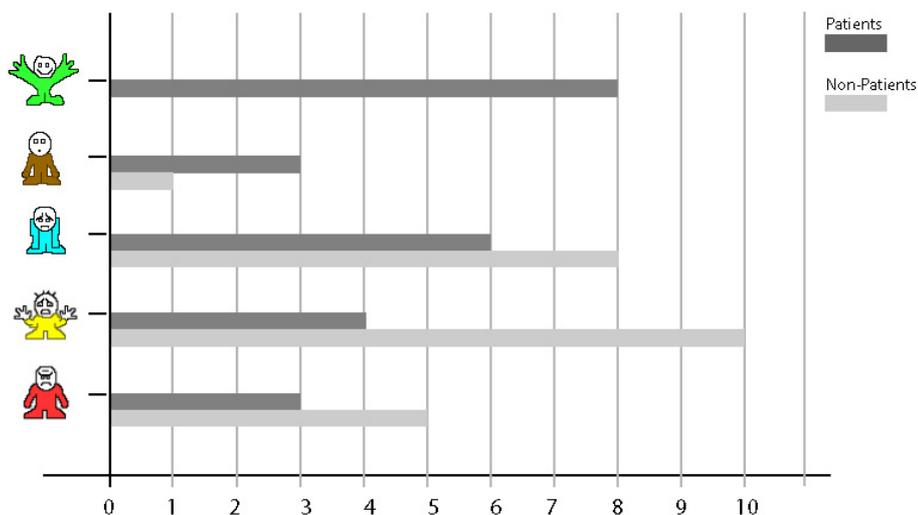


Diagram 7: Relation between choice of "Emotion" chosen by Patients and Non-Patients in the CPgame.

Diagram 7 tells us that not a single non-patient chose a positive emotion, where as the positive emotions were chosen several times by the patients. Translated into the actual game-situation this means: that the patients in several cases chose a positive emotion as the emotion that the fictitious patient "should feel". This, despite the fact that none of the patients were exactly happy about the unpleasant medical procedures that had taking place, just before the played the CPgame.

So why did only the patients choose positive emotions in the CPgame-world and not the non-patients? The CPcards (table 3) can give us some answers - but not all.

Player 11 and 12 were the most positive players among the patient group; they both exposed a very little degree of anxiety during the blood test, compared with the rest of the players, who in general were very negative about the medical examination. These two players both chose positive emotions in the CPgame. When asked (in the game-dialog) why the positive emotion seemed fitting, Player 11 gives the explanation: "because I was also like that" (she means "happy"). So Player 11 "felt positive" and chose positive emotions in the game. Her CPcard tells us that she was rated as very "brave" and "safe" during the blood test. So she exposed a positive emotion or attitude towards the medical examination. Player 12 also thought that the fictitious patient should feel happy "because I knew it was the right one", she explained. Like Player 11, Player 12 also seemed positive, during her medical examination. Both Players seems to be involved in an imitation of a real-world situation.

Player number 4, 5, and 6 all chose a positive emotion in their first emotion choice, indicating that when the fictitious child patient was being hospitalized, the players thought of it as feeling positive. None of these three players gave a verbal explanation to why they played the game that way. Here we can't say if the Players are involved in an imitation of a real-world situation. But it's possible that they looked upon the idea of "being hospitalized" as something positive, some thing that is "good" for them (as patients).

Player 1 expressed a high degree of anger and fear during the real blood test, but still chose "happy" as the emotion fitting best to the character in the game. When we asked Player 1 why he thought the fictitious patient felt happy about the blood test he replied, "Because he thinks its funny". Player 1 played the CPgame for the longest time of all players. He tried all emotions and secret powers out many times (see Table 10) - and kept on choosing the positive emotion in relation to the fictional blood test. Did he simply want the little animation-figure to be happy?

We can conclude from our data (CPcards and table 4) that Simulation, the experience derived from being involved in an imitation of a real-world situation, is in general strong among the patient-players. But the difference between patients and non-patients is that the patients are not *only* involved in simulation. They are involved in something else too. Their player experience seems to act as a (positive) modulation process to the actual (negative) situation, that they have just experienced themselves. This might explain why some patients, who were clearly very distressed about the blood test insisted on giving the animation figure a positive emotion. It also could explain why none of the non-patients gave the animation-figure positive emotions: they did not experience a negative or threatening situation (before interacting with the game) that needed modulation.

3.3 Sympathy and Nurture

Sympathy is an experience that emerges from the sense of being able to share emotional feelings with someone or something, e.g. a virtual character (Arrasvuori, 2010). In the CPgame the experience of Sympathy is encouraged through the Secret Powers; the player can help the main character (a child figure) by giving him certain "powers". These powers can help the child figure through unpleasant things, such as the inevitable blood test. The player has to catch the Secret Powers through a gameplay (fig.8).

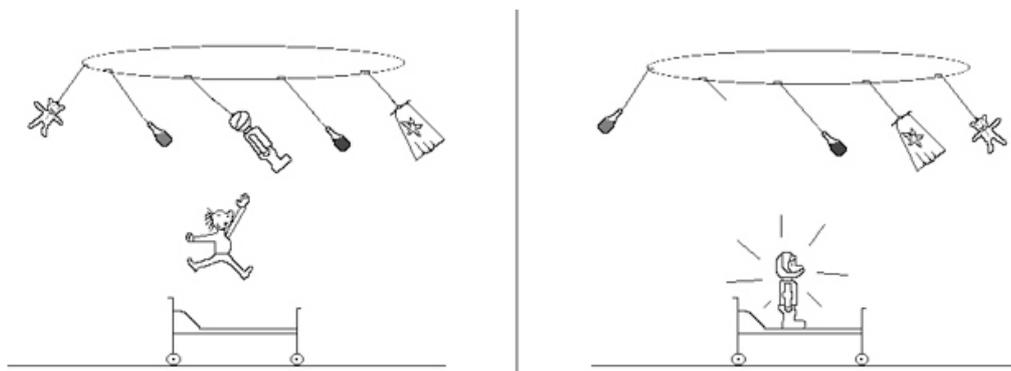


Fig. 8: Screenshot from the CPgame: the "Secret Power" gameplay © Knutz 2010

The "Secret Powers" consist of five different objects that the player can "catch" (in a carousel-kind-of game play) before going into the blood test. If an object is caught, the "Power" becomes visible: A teddy bear that the child figure can hug; an iron armour that the child figure can wear; a magic cape that makes the child figure invisible; a bottle of magic (light) liquid

that makes the child figure shrink when he drinks it; and a bottle of magic (dark) liquid that makes the child figure grow up when he drinks it. When the player has caught the Secret Power, that he or she think will help the child figure the best, the game can continue with that particular power attached to the game story.

If we return to the CPcards (table 3 and 5) we can see that often Sympathy motivated the players to choose the teddy bear. Player 20 expressed that the reason for giving the fictitious child patient the bear was because "then he can hug it"; Player 24 says "because otherwise he has nobody with him" (into the medical examination); and Player 14 says "then he does not get afraid when he is being pricked". The CPcards reveal that in many cases the motivation for choosing the teddy bear is rooted in Sympathy and in the experience of Nurture. Here the experience of Nurture (the need to take care for others) is an effect of Sympathy.

Diagram 9 gives us a picture of how patients and non-patients chose secret powers within the CPgame.

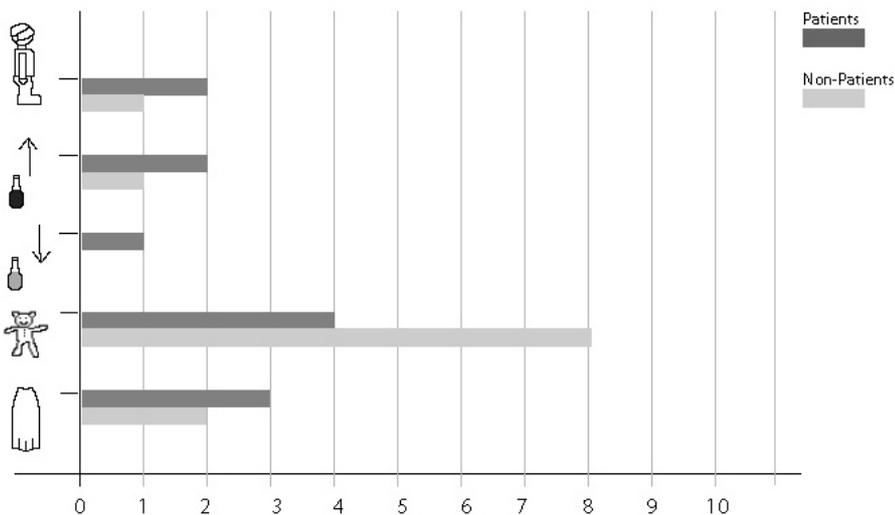


Diagram 9: Relation between choice of "Secret Power" chosen by Patients and Non-Patients in the CPgame.

The diagram illustrates that 8 of the non-patients chose the teddy bear as the Secret power that would help the child figure the best, where as only 4 of patients chose the bear. This is interesting since it is only the teddy bear that actually belongs to the real world; several of the patients do in fact bring their teddies into the medical procedures, whereas the other powers (becoming invisible, wearing an amour or growing big or small) truly belong to the world of fiction.

We can conclude that experience of Sympathy seems strong in both groups (in both groups the bear was the most popular object). But the patient-players chose to a larger extend the Secret Powers belonging to

world of fiction and imagination than the non-patients. The experience of Sympathy as well as Nurture seems stronger among the non-patients than among the patients.

3.4 Fantasy

Fantasy has to do with imaginary experiences and reveals what the world could look like - or how a possible future could look like; Fantasy as an experience, is the experience elicited from being engaged in make-believe and from being involved with fiction (Arrasvuori, 2010; Walton, 1990)

In relation to the CPgame, we are dealing with children's response to fiction and how they interact with that. We are inviting children to take part (as players) in a game of make-believe, in a fictional world that has certain rules. But fictional worlds (in books, films or games) are by definition incomplete because it is not possible to specify all the details about any world (Juul, 2005). This is where the player comes in; the player transmits his or her intentions into the game world. The sequence of action that unfolds in a game occurs as a result of the player's interaction with the game world - and the characters and objects inhabiting such a world. In that way imaginary experiences are encouraged.

In our case, half of the players must play the game under certain circumstances, when they are not well at all; when they have just been undergoing and uncomfortable (emotional) medical examination. So we are asking them to take part in a game of make believe that involves a situation that they have just experienced themselves. So on one hand we asking the players to relate to something related to the real world (the simulated hospital situation) by putting emotion on the little animation figure in the CPgame. On the other hand we are asking them to relate to something completely unreal, something pure imaginative, such as the Secret Power; that can comfort you (with a teddy bear), make you invisible (with the magic cape), make you strong and invulnerable (with the amour), make you small as mouse (if you drink the magic light drink) or make you grow up and become an adult in no time (if you drink the magic dark drink)

The Secret Powers is related purely to the imaginative experiences of what might help the child patient in the best way. If we focus on the Secret Powers, how are the imaginary experiences of the patient-players different from the non-patient-players?

We have already demonstrated (through diagram 9) that the patient-players chooses Secret Powers related to fiction and imagination to a higher degree than the non-patients players, who in most cases chooses the most real-world-related object of the Secret powers: The teddy bear.

If we return to the CPcards (table 3 and 5) and the verbal expressions in relation to the Secret Powers, we can see that only 5 patient-players gives a verbal explanation to why they think, a certain Secret Power is "fitting". The rest of the players do not express themselves verbally. This does not mean they don't know. They simply cannot or will not express why they choose as they do. But out of the five verbal expressions we have obtained from the patient-players (Player 2, 7, 8, 9 and 11) all of them are related to emotional issues. Player 2 says that the reason for choosing a Secret Power that makes the child figure invisible is "because then they can't see him, then they can't find him, then he doesn't get scared"; Player 7 chooses a Grow-Drink "because if he becomes an adult he won't be afraid"; Player 11 chooses the Grow-Drink, because "then you don't get sick so much". These verbal expressions related to the Secret Powers says clearly something about the patients-players emotions on an imaginative, narrative level; thinking that in the future, when you grow up, you won't be afraid anymore, or get sick.

Lets look at the non-patients: Nine of non-patient-players give a verbal explanation to why they believe a certain Secret Power is "the right one". Most of these verbal expressions are related to emotional issues, which involve the experience of Sympathy and Nurture (e.g. player 14, 20, 23 and 24).

But Player 13, 15 and 19 seems different. They are purely motivated by the goal or the fun of the gameplay it self; Player 13 chooses the amour "because its a boy thing"; Player 15 wants the Invisible Cape "because then they cant see him, that's funny!" (he laughs). Further more Player 15 enjoys when the animation figure gets upset. So he chooses "angry" because the animation figure "thinks it's *not* funny!" (he laughs); Player 19 says "I want to be grown-up because then I can better reach the others" (meaning: the others powers that are easier to catch in this particular gameplay, if the animation figure is big). These sorts of expressions indicate purely gameplay-related motivations.

None of patient-players expresses a pure gameplay-related motivation for adding a certain Secret Power to the main figure. Naturally, we cannot exclude gameplay-related motivation as a potential motivation among the patient-players. It is just not verbally expressed in our findings.

We can conclude, that patients play differently than non-patients; the patient-players chooses Secret Powers related to fiction and imagination to a higher degree than the non-patients players and from the verbal expressions we have from the patient-players (that concerns the Secret Powers) they all are seems to be related to their own emotional lives on an imaginative level.



3.5 Exploration

Exploration involves investigating of an (unknown) environment, object or situation (cf. Arrasvuori, 2010). A person can "act explorative" out curiosity, for the purpose of getting information or for the purpose of discovery.

Table 10 (below) shows the amount of choices that each patient makes at three different moments in the game: the first time they add an emotion (EC1), the second time they add an emotion (EC2) and when they add a Secret Power (SP choice). By choices we mean: how many times they play with different possibilities in each gameplay.

PATIENTS				NON-PATIENTS			
Player number	First E-choice (EC1)	Second E-choice (EC2)	SP-choice	Player number	First E-choice (EC1)	Second E-choice (EC2)	SP-choice
1	5	1	19	13	1	1	1
2	4	1	2	14	1	1	1
3	5	1	14	15	1	1	2
4	1	1	1	16	1	1	1
5	4	6	9	17	6	1	5
6	2	2	4	18	1	1	1
7	1	1	14	19	1	1	10
8	1	1	1	20	4	1	1
9	1	1	1	21	3	3	1
10	4	1	3	22	3	1	1
11	4	1	2	23	1	1	1
12	1	1	3	24	4	2	10

Table 10

So Player 1 (from the patient group) played with 5 "emotions" before choosing a final emotion (EC1). In the second emotion choice (EC2) the player chose the final emotion right away. In the Secret Power gameplay the player caught a Secret Power 19 times before moving on in the game. This shows a quite different play pattern than Player 13 (of the non-patients): This player moved through the CPgame by always taking one choice, not exploring the other possibilities.

As one can see, most players (10 players in each group) took only one choice in the second Emotion Choice (EC2), which concerns the blood test in the CPgame. That will say; they either did not want to explore the other emotions - or knew exactly which emotion were the most fitting one. Here there is no difference between patients and non-patients. But if we look more specific at how many players played "explorative" in either the game plays concerning Emotions or Secret Powers the general picture of

the play activity changes towards a more explorative approach among the patient-players. Table 11 illustrates this:

Explorative play activity Trying out 3 or more choices, in one of the game plays	PATIENTS	NON-PATIENTS
How many players played "explorative" in choice of Emotions? (Trying out 3 or more choices?)	6 Players (1, 2, 3, 5, 10, 11)	5 Players (17, 20, 21, 22, 24)
How many players played "explorative" in choice of Secret Powers? (Trying out 3 or more choices?)	7 players (1, 3, 5, 6, 7, 10,12)	3 players (17, 19, 24)
How many players played "explorative" in either Emotions or Secret Powers?	9 players (1, 2, 3, 5, 6, 7, 10, 11, 12)	5 players (17, 19, 21, 22, 24)

Table 11

We can conclude that the patients were equally motivated by their goal: to add the right emotion to the animation figure, but that the players of the patient group were more explorative than the players from the non-patient group; In 9 out of 12 cases the patients tried out different possibilities before moving on in the game with either new Emotion or Secret Power.

4. Conclusion

We have demonstrated how children's interaction with a computer game can be used as a method for letting children express their emotions towards a hospital examination.

We have also sought to make sense of the different Playful Experiences emerging from the Child Patient game - by defining the core components, forming the particular patient-player experience related to the CPgame.

Our findings give a detailed picture of a patient-player experience in relation to emotion driven game design. Most interesting is, that the experience of Simulation seems to be interlinked with and imaginary experiences. This has to do with the fact that the patient-players are asked to take part in a game of make believe that involves a situation that they have just experienced them selves. We are therefore suggesting that fictional and counter-factual emotions should play a fare more critical role in the communication with patients and deserves to be explored on a larger scale with Design Research.

Our overall contribution concerns the development of a new method of inquiry in Design Research, that addresses felt and sensed emotions as well as imaginative experiences. Further more, we contribute with a new

visual method within Healthcare, for understanding small children's unique emotional experience of hospitalization, illness and treatment.

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