# CONTROLLING EXPERIENCE OR EXPERIENCING CONTROL? REVERSAL THEORY & DESIGN FOR PLAY

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## ABSTRACT

Using Reversal Theory (Apter, 2002, 2007a) as an example this paper proposes a way to 'translate' a psychological concept into the realm of design in a way that maximizes understanding and potential for application in the context of play. The given presentation of Reversal Theory is the result of the analysis of student's use of available sources in idea development for play in children. The description aims to enhance the usability of the concept by providing a modular presentation of aspects which could be used in isolation but reach their full potential when integrated. Different options to use this modular framework in design tutoring are discussed. The project is seen as a step towards increasing the use of current psychological concepts to inform design for play.

Keywords: Play, Reversal Theory, design for experience, design ideas, design education.

## INTRODUCTION

When using psychological concepts and theories to inspire design for play the question is which concepts and what level of understanding are most likely to catalyze new design ideas for play. Using Reversal Theory (Apter, 2002, 2007) as an example this paper proposes a way to 'translate' a psychological concept into the realm of design in a way that maximizes understanding and potential for application. The challenge is to avoid often seen oversimplifications and at the same time reach high accessibility for designers.

In order to meet that challenge designers, design students and psychologists embarked on a co-

operative teaching project within a Masters course, 'Design for Children's Play'. The three-way interaction offered insights in the needs and problems of design students when trying to 'translate' social science content into design requirements for play. In the project students received overview lectures on Reversal Theory together with a list of easily available resources. In addition students could discuss their questions regarding the concepts with two psychologists once before they started to develop design ideas and twice during design iterations using their initial idea sketches and final design proposals (see Gielen, van Leeuwen & Westwood, 2011 for a detailed description of the project). Design requirements following Reversal Theory were cocreated between students and the teaching team. An analysis of students' questions and 'translations' of psychological concepts into design ideas resulted in a number of general as well as concept-specific issues in bridging disciplines.

## **General Issues**

I. Confronted with psychological concepts, students immediately tried to understand them in the context of design. Thus, the psychological concept was not first understood in isolation and then applied to the design brief. Both were instantly and eagerly integrated. While this test of 'usability' of the concept for design is an effective strategy, it also contains the danger to use premature understanding to create anchors for design and therefore lose out on possibly more relevant or inspiring parts of the concept. II. Prompted and spontaneous links to students' personal experiences provided an illustrative medium

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for understanding as well as an instant check of the external validity of the concept. This empowered students and was often crucial for their decision to implement the concept.

III. Attempts to reduce a complex concept to simplistic and disconnected units are understandable in the search for instantly applicable ideas. However, they ultimately diminish interdisciplinary integration and transfer to other design contexts. When asked students were expecting tables of behavioural information at different ages - ready to use like recipes (e.g. children at a certain age are interested in x, y, z....). While in certain circumstances this type of information can be useful, for idea development it often sets ill understood constraints of average developmental information rather than opening up a psychological possibility space for design which mirrors individual pathways of change. From a psychological point of view the static character of information that simply maps ages and general preferences leads to loss of opportunities for design inspiration in the area of play.

IV. There is considerable potential for misunderstandings due to the discipline specific vocabularies. While unknown terms can easily be inquired, the use of the same or similar vocabulary with different meanings does pose a more serious problem. For example the term 'transitional space' means extremely different things in physics than in a theory of play. Not noticing this can lead to frustration and interdisciplinary discussions to be lost in translation.

#### **Concept-specific Issues**

Reversal theory being a phenomenological concept does focus on the quality of experience rather than performance. Understanding play as a mental state defined by subjective experience rather than activity that can be determined from the outside by e.g. the use of toys was hard to grasp. Designing for experience can only mean to create a chance for this experience to happen. Design students reacted with disappointment to the lack of control over the experience of activities as play. The challenge for the tutors was to argue that, especially in the realm of play, an experiential approach demands the designer to share control with the user and to minimize instruction. Overcoming the listed problems requires to carefully choose and present psychological concepts in for designers effective or 'usable' ways without simplifying its meaning away.

The eagerness of design students to engage with psychological theories needs to be matched with sufficient understanding of the needs of designers by psychologists. The following work presents an interdisciplinary attempt to scaffold students' development of design ideas for play with conceptual knowledge presented in a way that minimizes the problems mentioned above and maximizes inspiration for design.

## METHOD

The following criteria for Reversal Theory presentation were applied:

- Close integration of concept description and design examples
- Enable grasp of complexity and integration of different aspects
- Highlight dynamic aspects of behavior as compared to static characteristics
- Highlight criteria for design based on individual motivation rather than performance
- The presentation should support a research by design approach, i.e. become an object with differing functions during design iterations and modes of interaction

The following material resulting from the interactions between 20 design students, their design tutor and two research psychologists were used in order to determine the structure and depth of information presentation:

- The concept material provided (lecture notes, literature and web-based material);
- Transcripts of real time or e-mail based question and answer sessions between students and psychologists based on the concept introduction;
- Initial and finalized idea sketches together with notes of idea specific discussions between students, tutor and psychologists;
- Final reports describing the design process and design concepts.

### RESULTS

## Using Psychological Theories in Design for Play

When using psychological theories it is important to be aware if they aim to describe/explain objective performance or subjective experience. When the focus of interest lies in e.g. age-related cognitive, perceptual or motor skills, then performance related concepts are most useful. However, when the focus of interest is on e.g. what motivates individuals to engage in a play activity then concepts and theories which aim to describe subjective experience and intrinsic motivation will be more fruitful. While both approaches provide valuable information for design and should ultimately be integrated, it is important to be aware of the difference in questions asked and types of answers to be expected from both perspectives.

Psychological concepts provide a fast range of perspectives on behaviour from the biological to the social and historical level. They are only partly compatible, partly exclude each other and partly stand simply next to each other. For a specific question in design it is important to choose a level of description that matches the domain and level of expected information. When the question concerns idea development for play, it is rather difficult to name one specific area of psychology which might provide inspiration since there are many perspectives which could do so. Michael Apter's Reversal Theory has been chosen for a number of reasons:

- Reversal Theory addresses the experience of and motivation to play independent of age.
- While being a highly abstract meta theory, Reversal Theory can be systematically mapped to concrete every day activity and provides tools to do so.

- Studying motivation as a dynamic system mirrors current scientific thinking which until now has got little attention in the realm of design for play. Highlighting the dynamic of play behavior instead of static characteristics is seen as particularly fruitful for the development of design ideas.
- The authors have made an explicit effort to facilitate interdisciplinary application

Note that the following description of Reversal Theory is an attempt to highlight potentially design relevant aspects rather than giving a full account of Apter's concept. The main aspects of Reversal Theory are presented from the perspective of play in form of four modules:

- Play and dimensions of experience
- Play as dynamic experience
- Play and control
- Play and excitement

Any play experience can be described with respect to all four modules. A possibility space for play-related design can be created using isolated modules or any sequence or hierarchy of them. Changing e.g. the sequence of use of the modules will change the leading aspects and with it the constraints and degrees of freedom of a design space.

## MODULE 1: PLAY AND DIMENSIONS OF EXPERIENCE

According to Apter (2002/2007a) any action is the result of the interplay of four motivational dimensions (see Figure 1). Reversals take place within a dimension when motivation switches from one alternative to the other – e.g. from being serious to being playful. At any point in time we occupy a position in this 4-dimensional space and feel more or less good about it. The relative attention to the



Figure 1: Four dimensions of everyday motivation. Adapted from Kerr & Apter (1992)

dimensions might differ over time, i.e. a motivational state might be determined by one dimension more than others. The emotions that accompany a state provide an individual with an evaluation which will guide action to sustain or change the current situation. High positive feelings in a particular state are indicative of optimal circumstances for action in that state. Correspondingly negative feelings indicate suboptimal or adverse conditions for action in a particular motivational state. This also means that depending on a motivational state or 'mood', one and the same activity or event can be experienced as pleasurable or right out annoying (loud music is a good example). Everyday experience can be characterized by a range of positions in that motivational space, what emotions they cause, and by the rate of reversals between alternatives. Individuals do differ in their overall preferences for certain areas in the motivational space and consequently the time they like to spend in them. Apter (2003) asserts that ".... we are very different kinds of people at different times in everyday life, and that this is the essence of what makes us human. Personality is dynamic not static: we are more like dancers than statues." p 474. The obvious question for design is then if and how objects, environments and interactions influence the position and its change in this space. Next to physiological parameters such as feeling awake or tired, situational parameters play a crucial role. They vary from the time of day to the roles one plays, the company we are in, and the action possibilities which are afforded by any given environment or object. Designing for play would mean to create situations/ action possibilities in which people are more likely to feel the desire to engage in a playful way. While this desire is expressed in the serious vs. playful dimension, preferences in the remaining 3 dimensions are indicative of preferences for certain types of playful engagement.

Before coming to the interactions between the different dimensions in a playful motivational state they will be introduced one by one and discussed in terms of their potential meaning for design.

## Dimension 1 - Serious vs. Playful

This dimension describes the extent to which we at a certain moment in time and in a certain situation are motivated to achieve goals and do whatever

necessary to get there (the telic state) vs. being motivated by an activity for its own sake which is a playful (or paratelic) state. However, the idea that play is without goal does only hold in the sense of goals, which are consequential beyond the play situation. For instance the building of a model space ship can be experienced as play motivated by the outcome and/or the process of making it depending on the player's preference. However, at NASA the same activity will be mainly experienced as telic since it has consequences for the individual far beyond the activity itself such as the professional integrity of the model maker or the specifics of the functions to be tested with the model.

The example also highlights that the type of activity as such does not render it as serious or playful. In other words almost any activity can be experienced as serious or playful depending on the motivational state of the actor. The resulting tasks for a designer in the context of play would be to either catch people in a playful mode or make them reverse from a serious to a playful mode. The former would mean to identify situations/contexts in which people are more likely to be in a paratelic state (e.g. break times in school and at work). The latter would mean to focus on trying to change someone's motivational state and create a situation, which makes them want to play. Rush hour commuting is an example of a situation where people are seemingly goal directed towards their destination and dreading the journey. Changing motivation into one where the activity of commuting becomes desirable in itself could be an interesting challenge (see for example the VW Musical Stairs project at the Stockholm Metro.

(http://www.youtube.com/watch?v=dN0eabGb-vI). A second example is given by The Tiger & Turtle sculpture by Mutter & Genth (2011) – see Figure 2.



Figure 2: Tiger & Turtle - Magic Mountain a walkable sculpture by Mutter & Genth Duisburg, Germany

A walk over the hill becomes an invitation to artisticly shaped playful detours.

#### Dimension 2 – Conforming vs. Rebellious

This dimension describes the motivation of an individual at a certain moment and in a certain situation to follow or defy rules, be conformist or rebellious. Games provide sets of rules and routines which regulate action and interaction providing a framework for play. The well-known attempts to 'bend' the rules or explore what happens when they are changed are sign of a reversal towards a more rebellious outlook in which the rules are questioned. Rebelliousness is inherent in many forms of play since conventional (or real life) hierarchies are broken down between players (Smith, 2010). Actions, which would have negative consequences in real life, can be tried out by taking on a role or making decisions in a play frame. The sense of freedom and control resulting from the opportunities to act against rules is a powerful motivator. Two aspects might support idea development: One is the division of control or decision power between designer and player - it ultimately determines to what extent the design supports activity prescribed by instructions and rules, or motivates the player to control the content of the play activity. Trying to allow within one play context for more conforming as well as more rebellious experiences could be an interesting focus for design. Note that not every rule is evenly interesting to break. This leads to the second aspect worth exploring for designers - the influence of age and culture on what is seen as rebellious. For example the rebelliousness of an 8 year old is rather different from that of a teenager, or adult. Figure 3 provides an example of a design which explored rebelliousness and created the possibility for primary school age children to perform a forbidden but desirable act (smashing glass) in a conformist context (saving, collecting and recycling of glass).

The willingness to conform has a place in play as well since the agreement about a play frame defining place, time, roles and rules contributes to creating structure and safety for individuals to engage in play. Over time design ideas develop often from a tightly controlled rule bound play scenario to one which hands over control to the player. The latter requires imagining an interacting player rather than just a person with a certain ability to understand rules.



Figure 3. Bottle bank. Design by Alen Halilovic and Ruben Rosenbrand.

#### Dimension 3: Mastery vs. Sympathy

This dimension describes the motivation for social interactions to be based either on power and control, or on cooperation and sharing. In a play context this refers to the motivation to compete, dominate and master skills vs. the motivation to be part of a shared idea or goal. Sports like tennis or athletics support the mastery and competition motivation in a relatively pure way. In contrast, team sports have an element of both - supporting the own team and dominating over the other. Some players might be motivated mainly by the team spirit, others mainly by the mastery and competition. Depending on the way the game unfolds players might reverse from one mode into the other. People can part take in essentially the same activity but with opposite motivations. Those joining a charity walk might be motivated by the urge to help more than the challenge of a walk. Those who are mainly motivated by the challenge might choose a walking competition.

From skateboards to games, competition and mastery are a major context for toys in western culture. The HABA Orchard board game for children from 3 years on is one of the few examples designed using player interaction based on sympathy rather than on competition. Children play together in order to defeat a game character. Again, the game actions and the final goal to win are not different from any other game; however, the interactions between the players are of a fundamentally different kind.

Supporting mastery and/or tough competition in direct balance with co-operation and empathy within one play context is seldom tried. This thought is directly derived from the dimension described above and demonstrates how concepts within Reversal Theory can be valuable grounds for design for play; it would be a worthwhile design challenge.

### **Dimension 4: Self-Other**

This dimension (also described as autic vs. alloic) describes the motivation to focus on individuality vs. group identity and belonging. Also the motivation to take responsibility vs. following group consensus is part of this dimension. Again, while people might differ in their general tendency to be more in one than the other mode, frequent reversals happen in any person depending on situational factors and mental state. Applying this dimension to play opens up different avenues: e.g. accommodating solitary vs. social play; aspects of individuality vs. identity; autonomy vs. belonging. The dichotomy between solitary vs. social interactive play is less straight forward as might seem. For example playing alone does not per se mean to play in a self-motivated mode. Take the example of teenagers designing their Facebook page - they might do that alone, and spend hours to create the right picture of themselves. However, what is the right picture might be strongly influenced by the community of friends they are part of. Play can be motivated by exploring the self in terms of cognitive, social, emotional and/or motor abilities and skills. At all behavioural levels play allows us to explore what one can and can't do, what one dares and what not. This creates self-knowledge. Toying with future selves is part of play from a young age on as is the exploration of identity and roles which consider the belonging to different social groups. For example when dressing up motivated by a focus towards others, costumes identifying known roles or characters would be a likely choice. In contrast, when dressing up motivated by a focus on individuality, items might be chosen because of a reference to individual preferences rather than social conventions. A good dressing up kit would embrace both options and possibly encourage reversal between the two motivational states. Again, formulating dichotomies on this dimension provides directions for alternative idea development in design. Seemingly contradictory states can be related to each other through the dynamics of reversal (from one extreme to the other), State alterations in the four motivational dimensions, provide a theoretical framework to the designer, which can be translated

into concrete behavior during play – The dichotomies stimulate creative thinking through a focus on the dynamics of behavior.

### Combining the dimensions.

Design ideas for play could be guided by choosing to design for activities which are likely to resonate with specific motivational profiles constituted by the combination of two or more of the four motivational dimensions. For example participating in a flash-mob will be more likely for someone in a motivational state characterized by inclination to be mischievous in a social rather than individualistic way and in which the feeling of belonging is significant. In contrast, playing racing games is satisfying when motivated by autonomous mastery and toughness. Many teenagers will engage in or decline both activities depending on mood and situation. Both situations afford playful engagement but satisfy rather distinct motivational patterns. Directions for design ideas can be created by combining motivational dimensions like shown in Table 1.

		Dimension 3 TRANSACTIONS	
		Mastery	Sympathy
Dimension 2 RULES	Conformist	Design Idea 1	Design Idea 2
	Rebellious	Design Idea 3	Design Idea 4
Dimension 4 RELATIONSHIPS	Self	Design Idea5	Design Idea 6
	Other	Design Idea 7	Design Idea 8

Table 1. Matrix combining dimensions 2-4 for the development of design ideas for play

One example of a design providing opportunities to act along differing dimensions is the Triple See-Saw

(see Figure 4). This outdoor play object in not meant to sit upon, but to stand and walk on. It invites users to try and train their balance. Each seesaw has an uneven surface and a different tipping behavior due to different weight distribution. One user can try out each seesaw separately, or try to cross over from one seesaw to the other, or be confronted with other players who cooperate or compete in the balancing act. The necessary level of balancing skills for each of these are quite different, and finding oneself trying and failing, succeeding, being overpowered by others, completely mastering the object can cause many reversals between excitement and mastery, or relaxation and boredom. This object invites players to create different goals and challenges according to different moods and social constellations. In other words, it gives them the opportunity to control their experience.



Figure 4. Pebblance, a triple seesaw. Design by Tim Overkamp

## MODULE 2: PLAY AS DYNAMIC EXPERIENCE

When asking what makes people want to play Apter's (2007) Reversal Theory provides a complex answer which is based on the combination of a motivational state and arousal. The theory states that any state of arousal can be experienced in either a goal-directed, telic or playful, paratelic motivational mode. In a playful state of mind, individuals might enjoy danger, incongruity, ambiguity,

and challenge. Different levels of arousal are experienced in a complementary manner in the two modes. In a playful state, high arousal is experienced as pleasant, i.e. exciting, and low arousal as unpleasant, i.e. boring. Complementary, in a telic or goal-directed state high arousal will be experienced as anxiety and low arousal as relaxing. (See Figure 5).



Figure 5. Emotional interpretation of arousal depending on metamotivational states being telic and paratelic. Adapted from Apter 2002, p. 19.

At any point in time reversals from one state into the other can happen. Take the example of consecutive moments of experiencing a rollercoaster ride: while queuing one may be looking forward to the ride, then get scared from the screams of people racing by in the carts, later be comforted by the sturdy safety brackets, aroused by the beautiful view from the top, terrified by the experience of free fall, finally thrilled by the feeling of having survived this uncontrollable ride. Individuals differ from each other in their interpretation of situations as dangerous or exciting. However, it would be wrong to conclude that play only happens at high arousal states - depending on situation and mood higher or lower levels of arousal are preferred within a playful state. When designing for play one can aim to bring about a change from the telic to the paratelic mode at about the same level of arousal as was described in the commuter example above. Like in this example, starting point would be a specific everyday activity or situation which has the potential to be experienced paratelic but is mostly not. Another approach would be to design activities which increase or decrease relative arousal levels within a playful state.

Figure 6 shows a design with the aim to lower young children's usually high arousal levels at the end of a museum visit but keep them in a playful state. In general embracing the idea of a range of arousal levels within one design will increase the duration of time it could be desirable for a player as well as the chance to interest a wider group of users. Design for play focusing on either increasing or decreasing arousal could spark quite different design ideas.



Figure 6.. The meditative museum experience, Design by Kine Handlykken, Nurgul Isik.

## MODULE 3: PLAY AND EXPERIENCE OF CONTROL

The rollercoaster ride described above can result in wanting to immediately repeat the experience by one individual and to never do it again by another. Moreover, some individuals would never see a rollercoaster ride as play in the first place while others might get bored after the third time. The difference according to Apter (2007a, 2007b) lies in the subjective experience of being protected and feeling in control. Individuals differ widely in how they experience one and the same situation and might also be inconsistent in their feelings depending on their motivational state and circumstances. Changing skills do play a vital role here but also a person's attitudes and preferences for differing levels of excitement contribute to varying preferences. In general individuals do prefer higher arousal in a playful or paratelic state and avoid it in a serious, telic state. Arousal levels increase, amongst others, through the experience of danger and risk-taking. The condition under which risks are seen as exciting rather than frightening is the experience of being in a protective frame. Apter (1992, 2007a) describes different levels of experienced (not per se objective) safety or protection as shown in Figure 7.

The confidence frame: in the presence of imminent danger safety is experienced due to trust in one's own capabilities to deal with it, often combined with trust in equipment, low chance and/or in others. This is experienced as exhilarating. Examples would be the participation in extreme sports or Urban Exploration. Note that the danger can be of any kind, not only physical. For example Urban Exploration can be connected to both a physical as well as a social threat.

The safety zone frame is associated with the absence of experienced imminent danger. An example would be to play a team sport in a sports centre or exploring a museum.

The detachment frame describes safety experienced through the fact that one is merely an observer of a dangerous situation who empathizes with changing arousal levels but without having to carry any consequences of the actions observed. An example is to empathize with the adventurous moves of the hero in an action film or watching high seas from the promenade.

Which of the protective frames is preferred in a playful state does depend on a complex set of situational and behavioural factors. The higher the experienced danger, the higher the chance of reversals to a serious state and with it the loss of the protective frame. What might seem an exciting climb in the mountains can suddenly be experienced with outright fear when equipment fails or bad weather moves in. The same reversal can happen when the stabilizing wheels are taken off the bike of a 5 year old or when the big bad wolf growls in a cartoon.



Figure 7. Protective frames as described by Apter (2007)

Design for play benefits from the awareness of differing preferences for protective frames within and over different persons. Changes within a person are partly due to gaining skills and/or understanding. The first ride on a bicycle without stabilizers can cause fear – after a while it will be experienced as perfectly safe and new challenges need to be found to increase

excitement and danger through e.g. riding down steep hills. Design supporting this dynamic process will reach wider audiences and sustain attention for longer. Figure 8 gives an example of a water toy designed with this idea in mind. It consists of a water bottle that is connected to a spinning spray nozzle. After it is filled with water and connected, air is pumped into the bottle. The spray nozzle starts to spray water and spin around, until the bottle comes loose and shoots of like a rocket. By kicking the disk that surrounds the bottle, players can influence the angle of the water nozzle and thus the height of the water jet. However, the nearer they come to the bottle the higher the chance to become soaked in water. Children are free to choose their distance from the bottle and with it control their level of excitement in balance with their experienced safety. They are entirely free to shape their interaction with the bottle as well as with each other and by doing so create many ways to play guided by their changing motivational states.



Figure 8: Spinning water toy. The red lines indicate the variety of directions the water jet can take. Design by Bob van Meiracker and Sander van Roosmalen.

## MODULE 4: PLAY AND EXCITEMENT

Playful activity is often driven by increasing excitement in any possible way. The increase in arousal caused by incongruity, ambiguity, unpredictability or stupidity can be enjoyed and embraced in a playful state while they are experienced as distracting and annoying in a telic state. Design ideas for play in this sense occupy a possibility space complementary to design for a telic state.

Apter (1992) proposed a number of interdependent psychological strategies to cause or increase excitement:

- Exposure to arousing stimulation (e.g. at a rock concert)
- Fiction and narrative (stepping in the shoes of characters)
- Challenge (any type of competition or skill)
- Exploration (finding the unknown)
- Negativism (rebellious behavior)
- Cognitive synergy (embracing ambiguity)
- Facing danger (playing with the sense of control)

Cognitive synergies are experienced when an object, situation or event has opposite or incompatible characteristics which leads to striking and surprising experiences (Coulson, 2002). Arcimboldo's faces made from fruit are a good example (Kriegeskorte, 1994). For play, the egg-and-spoon race is based on synergy: running and balancing an egg are two distinct yet ubiquitous activities. However, when combined they provide a surprising challenge to integrate requirements for speed and fine-tuned balance. It might be the synergy, which has kept the game alive for so long. The same principle of combining normally exclusive well known acts of balance was also applied in the triple see-saw shown in Figure 4.

The bottle bank in Figure 3 is an example of a design using synergies by coupling undesirable behavior with desirable outcomes.

With the exception of synergies the seven ways of increasing arousal and excitement are more or less obvious. Looking at these strategies in the context of the four motivational dimensions in Figure 1 reveals some close connections. 'Negativism' is related to the motivational dimension of Rules while 'Challenge' refers to the dimension of Transactions. 'Fiction and narrative' relates to the dimension of Relationships. The idea of synergies, does open up extremely interesting avenues since one could try to create play contexts in which the opposites of each dimension could become the seemingly incompatible aspects of an object, situation or event. Design for play could evolve from the idea to defy rules in order to play by the rules; or the need to empathize with others players in order to focus on individuality; or to defeat an opponent through co-operation. When combining dimensions such as in Table 1 even more complex possibilities emerge.

## **INTEGRATION OF MODULES 1-4**

Using Reversal Theory to its full potential means to integrate the different modules. There are options in the sequence of integration as well as in specific combinations of the modules.

Giving students a design topic of 'Fun with fears' for example implies to start with Module 2 taking into account reversals between excitement and anxiety at high arousal levels. Module 1 then could be used to identify dimensions of behavior for application. Module 3 would come into consideration when trying to design a situation which meets differing needs for feeling safe, yet excited. Module 4 provides a number of approaches to induce excitement. Figure 9 indicates a number of ways to integrate the modules in the course of idea development. In the context of ideation, the complexity of the concept opens up areas for thought experiments and creates unusual design spaces.



Figure 9. Schema of Modules 1-4 and examples for their integration

## CONCLUSION

Presenting a complex phenomenological concept in a way that meets the needs of design students had the aim to a) open up a much wider possibility space for design in a play context and b) provide concrete strategies to conquer this space. Working together with students of design highlighted problems of recognition, terminology and accessibility of psychological research. Overcoming the current, rather limited use of psychological concepts in the area of child play seems to call for an interdisciplinary translation.

Reversal theory (Apter, 2002) is a conceptual framework with, in our view, a number of designrelevant aspects. Embracing the dynamics of behavior allows to contextualize play within everyday life and draw inspiration from what play might mean to an individual in the context of concrete activities. Highlighting the existence of a variety of aspects from the outset should create awareness of complexity and support their integration. Reversal Theory offers many different anchors for themes apparent in a design problem. Instead of a general 'Reversal Theory for Design' approach we opted to explore the theory from a specific type of behavior, which mirrors the interest of designers being contextualized rather than abstract and general. Choosing play as the type of behavior chimed with both, the very topic of the design course and the level of abstractness of Reversal Theory. Narration, examples and the modules chosen focus on the theme of play. Other areas of behavior as well as other phases in a design process would call for alternative aspects and representations of the same psychological theory.

Describing the theory in the form of modules aimed to create sensible portals for access to aspects of the theory in the context of play. Highlighting their distinctiveness as well as their interrelatedness does justice to the complexity and dynamic character of Reversal Theory. We attempted not to simplify but to clarify the possible meanings Reversal Theory can have for design in the context of play. The concept has been used to clarify the existence of choices to be made by a designer rather than dictating choices. Depending on what module is used as the portal for entering Reversal Theory and the order in which the links with other modules are followed, the possibility space for design can be shaped and developed. For designers - either in the analytical or ideation phase of design - different paths may lead to different anchors, different prioritizations and different outcomes. Design tutors may use this process to help students shape and build their design thinking; more advanced practitioners may experiment with the influence of different paths on design outcomes. For optimal outcomes, it should not be a random path. The above presented description of Reversal Theory is not more than an iteration in the process to make psychological research more accessible for students of design. Analyzing its effect on quality and quantity of ideas for play developed by students will shed more light on the effectiveness of the presented work. We hope to have created the starting point for a productive interdisciplinary dialogue in the realm of design for play and with it the chance for inspiration and invention.

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