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Toys as enablers for self-producing social systems: Experienced pleasure within play

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Abstract

Some games and toys seems to endure, develop and split into new games and toys, and further engage in their sub-forms. Football is one example, which is a game that has spread around the world, and been hybridized by culture and individual influence (Giulianotti, 2000; J. Tangen, 2004). Thus, there is something about games like football worth analyzing within the research on pleasure and pleasurable products. This paper aims to disclose and define systems of expectations particular to games, specifically football, in order to find general properties in games that engender feelings of pleasure, which can be infused in the designing of other games and toys. The turning points for the discussion in this article are the pleasurable dimensions within games (i. e., football) and pleasure in play in general. The aim of this research was to disclose the aspects of football related to pleasure by way of a theoretical analysis of the framework of autopoietic or self-producing social systems of interaction, a term coined by Niklas Luhmann, and play. This study shows that the intersection between the unknown and expectation seems to form a potential for new experiences that elicit flow, challenges and pleasure. This results in contexts that enable numerous possible behaviors as a result of emerging social sub-systems generated by a central system. Based on the findings, this study suggests that when designing toys it might be beneficial to create a basis for play, which consists of a complex system that includes play-space, rules, variability of use and strategy in which the users themselves can expand, build and alter. This study reflects implications for toy designers to utilize the dimensions of pleasure engendered by the analysis of football in light of autopoiesis.

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Keywords: Toy design; Autopoiesis; Self-producing systems of social interaction; Game design; Pleasure

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1. **Introduction**

Several of today's toys are presented as if they elicit pleasure during play; however, children and adults often experience that the pleasure elicited by toys and games can be very short-lived. This article seeks to reformulate toy design within the concept of self-producing systems as proposed by Niklas Luhmann in order to understand the possible functions of play and experience of pleasure elicited by toys and games. Luhman's statement, "meaning is the link between the actual and the possible" [1, 2 In] creates grounds for an analysis of how toys can elicit play which leads to self-producing systems. The game of football, which makes a framework of play, is the object of this study.

2. Method

Sociologists have looked to biology and the dimension of recursive or self-producing systems, termed *autopoiesis* by Varela and Maturana, to obtain a deeper understanding of social systems within sports and organizational learning [1, 3, 4]. This study is oriented toward the exploration of toy and game design in light of recursive systems of interaction. Analysis by the manual mapping of actions, communication and tactics, specifically within the game of football, made the basis for gathering the empirical data. Several social interaction systems were identified within this empirical data, which may come to be while playing football. These potential systems were further analyzed within the framework of sociology and Luhmann within the theory of autopoiesis [1, 2].

The epistemological approach for this study lies somewhere between a systemic and social constructivist view. As an example, Maturana acknowledges existing systems and observable entities, and for Churchman, the "systems are predominantly in the mind of the observer rather than in the real world" [5, 6]. This article builds on the observation of systems, but the discussion lies within expectations as ways of understanding and communication.

3. Football

Football is an activity which is dependent on physical boundaries and elements, rules, expectations and interpretations, planning, etc. in order to function. All of these elements form direct behavior on the field and the tribune. The game is popular and has, over time, formed comprehensive systems containing companies that manufacture shoes and sporting goods, establish and run sporting clubs, children's clubs, sporting arenas, FIFA and the world cup, catering services, supporter clubs, etc. [7-9].

If we stick to the activity on the field and in the arena, however, we will find the creation of other systems, namely "systems of interaction". These systems of interaction occur and disappear frequently during play, and last for an instance or over time. They are elicited by play that involves: specific knowledge, skills, tactics and tactical understanding.

4. Play

Huizinga emphasizes play as a voluntary and "free activity standing quite consciously outside ordinary life as being not serious" and "fun" [10]. Free, in this context, is understood as voluntary, but not free from influence. Rules are an important part of play, while play is defined in various disciplines and is often seen, from evolutionary and psychological perspectives, as a way of preparing for life [11]. These perspectives are typically oriented toward the consequences of play and the purposes play serves, such as obtaining skills, and not what "play is in itself" [10]. Within the boundaries of play or rules, a player would indeed ruin the game without serious intentions [12]. A high degree of seriousness involves the participants taking risks; moreover, "it is the risk that makes play attractive" [12-14].

Caillois' work, which builds on Huizinga's *Homo Ludens*, categorized four different dimensions within a game (see table 1) [13, 14]. Huizinga states that "as the opposite of aesthetics is not ugliness but apathy, the opposite to play is not seriousness but the automatic" [10 In , 13]. Accordingly, playing within the understanding of Huizinga with something concrete and experiential stimulates understanding. This demands a certain autonomy in how one plays in order to prevent automatic behavior. Nevertheless, as Katya Mandoka argues, based on Lakoff and Johnsen,

"the cognitive function" of metaphors is a "projection of something concrete and experiential to understand something more abstract, [which] is closely related to play [13, 15]. Mandoka, therefore, suggested Peripatos' (explorations) as a fifth classification to Caillois' categorization of games, which entails exploration as in "what if" to be a central facet of games.

Table 1. Caillois' categorization of games with Katya Mandoka's contribution of Peripatos [13, 16].

Games	Action	Condition	Main property
Agon	Challenge	Rivalry	Contest
Alea	Gamble	Tremor	Chance
Mimicry	Imitation	Simulation	Disguise
Ilnixx	Frolic	Vertigo	Balance
Peripatos	Exploration	Adventure	Conjecture

4.1. Toys and transmedia storytelling

Today's toy manufacturers have found that toys linked to media are often the bestselling ones [17, 18]; therefore, today's toys often exist on a multimedia platform. Each type of media represents different sets of challenges and ways to play and, therefore, often reveals different pieces of information about the narrative to form the whole plot. Marsha Kinder coined the term *transmedia intertextuality* to explain this division between the supplementary dimensions of a toy that enlarge the experience and the toy's market potential [19]. Henry Jenkins later uses the term *transmedia storytelling* [18, 20]. The success achieved by presenting a toy connected to a narrative, as in this example, has led to a development strategy that starts with the creation of a narrative followed by the development of tangible toys. The movie *Toy Story* is an example of such a process, in which the movie "actors" are in fact toys, which are, in turn, sold as real toys. The development of such toys that perform across multiple media platforms has led to the creation of *supersystems*, in which a toy merely forms one part of the whole concept [19].

4.2. Rules

Rules make the essence of a game. Bernard Suits describes games as:

To play a game is the attempt to achieve a specific state of affairs (prelusory goals), using only means permitted by the rules (lusory means), when the rules prohibit the use of more efficient in favor of less efficient means constitutive rules, and where such rules are accepted just because they make possible such activity (lusory attitude)… Playing a game is the voluntary attempt to overcome un-necessary obstacles [Suits In 21]

This definition takes the rules into account, as well as the playfulness, but fails to include the importance of the affective dimension of playing a game. Jasper Juhl's version takes in this dimension by saying that:

A game is a rule-based formal system with a variable quantified outcome, where different outcomes are assigned different values; the player extends effort in order to influence the outcome and the player feels attached to the outcome … [Juhl In 21]

Further, Perinbanayagam brings in the engagement, social and dialogic dimensions by his description of games as:

Acts that human agents undertake, as players or spectators, to achieve cognitive involvement and emotional engagement with the other. The playing of games is, in fact, a conversation, a dialogic activity that systematically involves other agents, a continuation of the other processes of everyday life. It is also a means by which a human agent achieves intercourse with the other by using a range of symbols that is broader than language. [21]

Perinbanayagam's definition is thus more socially oriented, and facilitates a broader discussion. Supplementing this definition with the creative dimension, however, extends our understanding of games even more, since this can be a driver to the dimension of competition as well as the pleasure of making something new. Mikkel Tin, who has explored rules from a maker perspective in his book *Spilleregler og Spillerom: Tradisjonens Estetikk (Rules and Play Space: The Aesthetics of Traditions)*, proposed that "rules free the artist from responsibility" through limiting

personal choices, which further "makes a space for play" superior to the space that emerges by an autonomous process [22]. Thus, when people's interests in activities are self-controlled, but within a framework of rules in which social interaction may occur, they may facilitate the dimensions of the unknown, planning, gambling and exploration (Mandoki, 2007).

5. Autopoiesis

Autopoiesis was first described by the biologists Humberto Maturana and Francisco Varela [3], who was engaged in finding a biological theory that could serve as an alternative to the Darwinian ecology theory [4]. Maturana and Varela claimed, in opposition to the linear process of environmental selection from Darwinism, that systems "interact themselves in a recursive fashion" [4].

When the autopoietic perspective lays the groundwork to understand communication systems, such as in football, the theory suggests that:

Communication should not be understood as mere information transmitted from a sender to a receiver, in the sense that the information is seen as parcels of information that move from one to the other. Instead, information is seen as being created with the receiver through interaction with his/her existing cognitive framework [In 3, 4].

The communication, thus, is not only dependent on the context in which it happens, but builds upon the eventualities, decisions and expectations influenced by the social system, prior to and as it happens [1, 3, 6]. Accordingly "the fundamental feature that characterizes … systems is autonomy" [23], and this autonomy "is a feature of self-production" or autopoiesis [23]. This understanding describes a situation where processes are recursive within the entities themselves and not between stable beings or objects [4].

Niklas Luhmann found the concept of autopoiesis apt in order to describe and study social systems. His general autopoetic theory is outlined in the book *Social Systems* [2, 4]. Here he presents several facets of self-producing systems and society. As Giddens and Stafford Beer found, the theory on autopoiesis contributes considerably to the study of social systems; Hernes and Bakken have applied the theory to the study of organizational theory; and Tangen utilizes Luhmann's theory of self-producing systems to explore behavior in relation to sports and sport facilities [1, 4]. The complexity of behavior connected to play and games makes the theory of autopoiesis interesting as an analytical perspective in order to understand more about play behavior and what kind of behavior people find pleasurable. This is mainly because of the descriptions of *unknown* behavior and attitudes elicited by games and toys, to which the theory of autopoiesis can provide insight by the notion of *expectations*. Autopoiesis describes the recursive systems, or self-producing systems, which are of a stable kind. This is in comparison to the *social systems of interaction*, which are created while an activity (such as football) is acted out. These situations or systems may occur suddenly and then disappear swiftly, and are mainly driven by expectations which, again, are based on the history of expectations and interactions [6, 23].

This paper aims to disclose and define such expectations that are contingent or created by games (football in particular) in order to find general properties in games that engender feelings of pleasure, which can be infused in the designing of other games and toys. This research aims to answer how the play behavior and following pleasure are generated, rather than what play and pleasure are. This in line with Maturana, who stated that when exploring system behavior one cannot point to what intelligence is, but how intelligent behavior is generated as a consequence of systems.

5.1. Football II, Intra- and interactions and self-organization

The football game is a team activity where 22 players engage in one field and creates complex patterns difficult to grasp. This opposed to dyadic sports where pairs compete and the two make the most of the match with the influence of a possible spectating crowd. Football thus represent "Irregular and varied periodicities in team behavior"…and "the coupling and de-coupling of many oscillators [waves]" [24]. Accordingly, the game consists of wavering collective movements in time. This has led McGarry et al. to emphasize that team sports should be "described in dynamical terms" [24]. McGarry et al. further suggests, that "team sports are the composite of myriad -coupled dyadic intra- and interactions" [24] (see figure 1.) which resembles with Perinbanayagam emphasis on the dialectic facet of football.

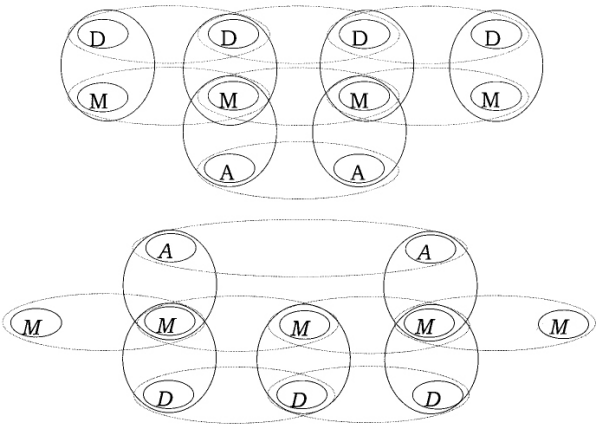

Fig. 1. Some possible intra-couplings for two contesting soccer teams. The first team (upper half) is using a 4-4-2 formation and the second team is using a 3-5-2 formation. D = defender, M= midfielder, A= attacker [24].

Schmidt et al. (1999) provided an example of such intra-and interactions by the example of a breakdown of a stable pattern in basketball where a player would perform a *backdoor* move. This move involves an attacker promptly turning around and taking a couple steps towards his or her own basket followed by a new turn headed towards the opponents basket. The backdoor move "involves exploiting the space just created behind the ensuing defender" [24, 25]. The backdoor move represents possible order and control parameters for game analysis and strategic planning [24, 25].

5.2. Social systems of interaction

The self-organization of new systems of interaction and structural patterns will thus emerge out of instability triggered by for example a backdoor move. Moreover fluctuated chains of autopoietic social systems of interaction constantly occur during a football match and represents a factor of unpredictability as well as planning. Perinbanayagam acknowledged that football not only consists of "passes, attempted interceptions and successful ones, with fouls of various kinds and out of bounds moves" but also of "dynamic network of cooperation and conflict. As these relationships develop, they create the emergent reality of a coordinated series of moves that are organically related to each other" [21]. This implies that no progress of a football game can ever be the same and more importantly, the emphasis lies within the dialogic structure of the game; as he put it,

This moving network always creates its dialogue within itself in constant awareness of the active presence of another network of relationships that is only waiting to enter into an adversarial dialogue. Every move that the agent in the soccer field makes, then, is in terms of a dual awareness, a friendly partner and an adversary who will try to interrupt the dialogue.

The backstep move is an example of dialogic interaction and an interruption of stability. An example of a more complex consideration within a dialectic network in football could be the moment when a defender has the ball, and is planning what to do with it in order for the team to make a goal; thus, s/he must make a decision. This judgment will be based on the actual situation perceived in this very instant by the defender having the ball, and numerous eventualities concerning what the other players on the field may think, choose to do, what they may be capable of doing and strategy in general. One of the teammates on the left flank may take a run towards the other end of the field, and by doing so; s/he is a potential objective for a pass. Such a movement by the wing forces the defender on the other team to follow the run in case s/he gets the pass. The flank run thus opens up a space for other players to get the pass or for the defender to run into, taking the ball by him/herself. The rest of the defenders on the other team will create expectations for what the defender might do with the ball by the examination of the situation. What is normal? Where is s/he looking? What does this person normally do? What does it seem like this person is capable of

doing when observing the physical properties, movements and handling of the ball? Accordingly, there is a great deal of communication and flow of information amongst the players in relation to movements, prior movements, knowledge and expectations, which influence the play.

Such "social systems of interaction" occur via the contextual setting consisting of specific players on the field, historic experiences, planned tactics, cheering of the spectators, place on the field, etc. Thus, the emergence of this social system of interaction is recursive, self-produced or autopoietic in the given situation. The essence of such a system is that it is short lived. In this example, however, the system may last for up to 90 minutes, or through games or even seasons. This may come to be by, for example, a defender who chooses to tackle somebody hard, as the very first thing s/he does in a match will cause the attackers on the other team to be more careful. If this type of tackle is something that this defender usually does, a reputation may emerge and further elicit or influence the social systems of interaction that run over years. Accordingly, autopoietic social systems of interaction may be of a more stable kind or influence over time as opposed that of the self-organization, which is a process that happens in an instantaneous, sphere.

5.3. Expectations of expectations

Accordingly, in a social system of interaction, where communication is created with the receiver through interaction, the system serves to engender "continuing communication" [1]. This continuity is highly influenced by expectations and "expectations of expectations" [1], as well as the history of interactions and expectations. It would be impossible for the players in both examples to foresee, plan or fail to hinder any action without personal expectations, and having some insight into the expectations of others given the context. Accordingly, thoughts like *I expect that s/he will expect me to do …*, occur as a result of the specifics of the game. Asking such rhetoric questions may thus prepare players for what will happen or the experience will serve as an obstacle to foresee new possible moves.

5.4. Planning

When the expectations of expectations work as a system of communication, one is able to use experiences from prior interactions and the present social system of interaction to lay plans for the actions to be taken. The example of a defender who is considering what to do with the ball involves a kind of thinking that resembles how one would think in chess. One considers the movements and tries to foresee the potential movements of the opponent, and then, based on experience and the present communication, lays a strategy for an attack.

5.5. Artistry

Numerous definitions of games involve the common goal to win in some way [21]. Winning is an acknowledged part of the game, but for some people the dimension of *agon* is not only represented by victory in the number of goals or points. Rather, one often sees in football that players put emphasis on a more internal form of competition, by tricking the adversary. Once, I watched a football match with my son's team, which they lost with the score of around 0-9, and one of the boys enthusiastically proclaimed on the bus on the way home, "did you guys see that Zidane trick that I did just in front of the goal?" Thus, his goal was perhaps a competitive one, since he wanted to lure his opponents, and also wanted to show his skills in a sort of performance. You often hear football players say similar things when being interviewed after a match, such as *we played well and had fun even though we should have won*. Typically, it is the expectations of the supporters, media and team owners that demand victory. For many participants, competing is a matter of mastery, in general, and mastery as performance or artistry by showing skills that lure or trick others. The artistry can be seen as the opposite of shared planning, and may be seen as a factor of unexpectedness. However, the goal for the action is perhaps to cause perturbation in the communication system, where such perturbations may trigger a structural change in the social system of interaction and, more concretely, a structural change of the players' setup. If there is a forward who constantly performs artistry, the opposing team may pull down offensive players to protect against the unforeseen activity by that artist.

5.6. Unintentionality

When two systems of interaction meet, they undergo some sort of structural coupling, and this coupling may lead to further communication or non-communication, depending on the plasticity of the structure [6]. When two systems meet in a football match, the teams will often try to measure how the other team works in the beginning. Accordingly, the dialogue is created by the plays or by the way that the social system of interactions meets. This encounter or coupling also represents a whole system that combines the two systems of interaction represented by the teams. If such a coupling does not occur, one of the teams will often fail to understand the way of play by the opposing team. Hence, the lack of being able to plan due to misinterpreted or mistaken expectations may lead to unexpected actions. Certainly, there are several physical explanations as to why one may misinterpret a situation, such as a bump on the field that causes the ball to take a new direction, twist in the ball which gives the curve of a football shot a surprising direction, among others. However, if we stay within the discussion about social systems of interaction, the misinterpretations also lie within the lack of understanding the opponents on the field. This is because the coupling of systems may represent a surprise of some sort. Often you see that a team that has a sudden change in how they play takes the opponents by surprise. An example of such a situation is the Norwegian football team, who changed their tactics completely in the early nineties. From playing a conservative ball possession game, they became keener on breakthroughs; consequently, they always passed the ball in the direction of the adversary's goal, where there was a very tall forward who would head the ball to his fellow players or towards the goal. This tactic surprised the opposing teams time after time, and resulted in Norway partaking in the world cup twice. After a period of about fifteen years, the Norwegian strategy became less effective as the other national teams came to learn the planned system. The tactic which served as a perturbation triggered a system change over time, and illustrates the intelligence of the systems [6]. Thus, the tactical surprise may be discovered instantly by an opponent, but the delay of the system often results in amazement by the same opponent several times before their expectations of expectations are adjusted to the new system. In this way, the systems have plasticity, but the altering process takes time [6].

6. Toys as enablers for self-producing social systems: Experienced pleasure within play

The dimensions that this theoretical study has disclosed represent dimensions of a complex rule based game platform in which autopoietic social systems of interactions are elicited. Based on the hypotheses that the game of football elicits pleasure because it is popular and widespread across cultures, the dimensions of play disclosed by the analysis of playing this game, are assumed to represent facets of the elicitation of pleasure. Accordingly, pleasure relates to the dimensions expectations of expectations, artistry, planning and surprise, which have been proposed as a possible addition to Caillois' categorization of games in order to obtain a broader insight into games and the elicitation of pleasure (see Table 2.)

Table 2. Dimensions of play disclosed by the analysis of football in light of the theory on autopoiesis, Tore Gulden.

Game/dimensions of play	Action	Condition	Main property
Expectations of expectations	Communication	Autopoiesis/autonomy	Social systems of interaction
Artistry	Tricking	Mastery/risk	Praise/rage/aesthetics
Planning	Prediction	Trust	Strategy
Surprise	System coupling	Self-organization	Unexpectedness

Furthermore, while designing the activity of play that a toy may elicit, one should consider infusing the mentioned dimensions in order to make toys that perform between the unknown and expected. Thus, the perceived quality or feelings of pleasure may be strengthened by playing with toys that elicit social systems of interaction, praise/rage/aesthetics, strategy, unexpectedness and self-organization.

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