Developing a Theory of Player Intent in Board Games

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ABSTRACT

This paper focuses on the relationship between rules and player experiences. We begin the paper by asking, "How does a game's design create fun for players?" only to reframe it to "How do players use games to create fun?" This reframing has three benefits. First, it considers players as active creators instead of passive consumers of experience (Players as Designers). Second, it views gameplay as a crafted and intentional property apart from being an emergent property. In order to approach this question, gameplays of six abstract strategy games are subjected to event analysis. The analysis results in identifying events across five layers. Through events, we can give ontological attention to gameplay and how players experience fun while creating the gameplay. We found that players create gameplay with intent. Based on our findings, we propose *Intent Obfuscation Theory in Board Games*.

The paper contributes to the design research in games in three ways. First, it views gameplay as the ultimate particular and players as designers. This expansion, we find pertinent for design research. Second, is identification and characterising gameplay through different events. Thirdly, proposal of the Intent Obfuscation Theory in Board Games, which we believe will find a place in player experience studies in board games.

Keywords

Board games, Player Experience, Fun, Rules, Design Research, Player as Designer, Gameplay as Ludic Form

INTRODUCTION

The ludic experience of board games is distinctive. A player reads the rules, voluntarily follows the rules of play, and during the play, she experiences fun[1]. In this paper, we consider fun as a larger gameplay aesthetic (as suggested by (Sharp and Thomas 2019)) and a fundamental experience of playing board games. We approach fun in board games from a design perspective. We begin with the question – how does the design and the configuration of game elements create the experience of fun? The question is asked to design research in different forms (Järvinen 2008; Cowley et al. 2014; William and Alexander 2017). For design research, this question is pertinent as it extends the scope of design analysis – from studying the configurations in and of the game structure (Aarseth 2007) (called design analysis of game structure) – to the relation between the rules and the created experiences (Cowley et al. 2014) (called design analysis of experiences). Given the expanded scope, design research in games faces an epistemological challenge (Howell and Stevens 2019).

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EPISTEMOLOGICAL CHALLENGE OF STUDYING FUN IN RELATION TO GAME RULES

Fun, like other experiences in games, is a second-order design problem (Salen and Zimmerman 2004). Game designers cannot design fun directly; only by designing rules can they design fun. In this paper, we begin by considering board games as procedural (Bogost 2010) and, thus, game rules as the core design of the game. Through the design of rules, designers are tasked to create the intended experience. It is through, and till the design of rules a designer can transfer their authorial intent (Švelch 2014). There is a design-phenomenological distance between — the rules (which can be designed in games) and the experiences that the design creates (and cannot be designed directly). This distance, conceptualised as second-order distance, affects game designers and game design researchers.

Second-order distance puts a space between the designers and their intended gameplay experiences. While designing a game, designers have to gauge the experience emergent from the rules using their 'sixth sense' (Salen and Zimmerman 2004). For researchers, the second-order distance creates second-order analysis problems (Howell and Stevens 2019) when studying fun[1] and other experiences in relation to game structure. It creates two issues for design researchers. First, researchers only have access to the experiences of the players and of the rules. Experiences are a complex emanation of the game structure. To study game structure from the captured experience, a researcher has to take interpretative leaps to be able to analyse the game structure. In this sense, second-order distance creates methodological barriers for design researchers. Given the goal of design analysis of experiences, the barriers create epistemological challenges.

The goal, however, is framed from a proceduralist point of view – wherein it is assumed [2][3]that the meaning, and hence fun (Sharp and Thomas 2019; Sicart 2008), lies in the structure of the game. The epistemological implication is that fun resides in the game itself; games are the delivery medium of fun. Thus, in order to solve a problem of fun, a design researcher needs to understand the game structure. In design research, such a frame is known as 'Technical rationality', where a designer should know ways in which fun can be designed. It reduces the designer to a seeker of the solution to the problem of fun and the players to the 'consumers of fun'. Within this view, the designer has to provide fun to the players by designing rules. The question, however, posits a crucial and valuable link – that between the game structure and the emanated experiences. In this paper, rather than shifting the focus of the question, we re-examine the design research frame to suit the second-order design problem of fun, thus approaching the epistemological challenge.

We develop upon Stolterman's idea of design research (Stolterman 2008) [4]– to focus on the ultimate particular means to the ultimate particular ends. The design focuses on creating an object, a system, or a process for specific design situations – which are defined as ultimate particulars. Design situations are loosely understood as the environments in which designers interact with the design problem. Ultimate particulars are non-universal and contextual to a particular design situation. Design research focuses on studying such ultimate particulars – ends and means both.

In the case of game design, the created experiences and gameplay aesthetic are 'the ultimate particular ends' in the sense that games fundamentally help create

experiences. To find 'the ultimate particular means' to the end – fun, we deliberate on two possible ultimate particulars of fun – Rules and Gameplay.

RULES AS THE ULTIMATE PARTICULAR MEANS

In the broadest sense, rules are the ultimate particular means to fun, for it is by following rules players experience fun. It is by designing rules a game designer shapes the experiences. However, there are three issues when considering rules as the ultimate particular means to fun. (a) Within this frame, game design creates an exception to the general understanding of design. A game designer may not always respond to design situations as conceptualized by (Schön 1992) and as used by Stolterman (Stolterman 2008). Thus, she does not individually create several ultimate particular means of fun. Instead, she creates a rule system through which the many ultimate particular means to fun *emerge*. In this vein, she designs the rule sets through which players can create as well as respond to the situations. (b) The experiences and game structure (rules) are separated through a second-order distance. This creates a segregation between the two design analyses – of game structure and experiences. This consideration does not aid in analysing the link between the experiences and the rules. (c) Treating rules as the ultimate particular means discounts the role of players creating fun, thus treating rules as a fun-generating machine and players as consumers of fun.

GAMEPLAY AS THE ULTIMATE PARTICULAR MEANS[5]

Gameplay is the connection between the rules and the experiences. Bjork and Holopainen argue that gameplay is a structure of player interactions with the game system and with other players in the game (vide (Guardiola, n.d.)). Guardiola adds an affective and emotional component to the conceptualization – the gameplay consists of the actions performed by the player when involved in a challenge. It emerges from the emotionally charged interaction between the player and the game components." Thus, gameplay is a structure which emerges out of the rule system. Within such a structure, players can experience fun. Thus, we argue that gameplay, too, can be considered the ultimate means of having fun. Sharp and Thomas argue that the ludic form is the structure in which fun emerges (Sharp and Thomas 2019). It is one of the three proposed conditions essential for fun to emerge. (Dhamelia and Dalvi 2022) propose that gameplay can be considered as the ludic form. In this vein, gameplay can be considered as the ultimate means of having fun.

Since gameplay is a structure of interactions from which fun emerges, considering gameplay as a means to fun provokes several questions and reframes older ones. For whom is the gameplay an ultimate particular means of fun? Designers, as discussed earlier, only have indirect control over the gameplay; only through rules they can shape the gameplay. For them, rules are the ultimate particular means to shape gameplay and create fun. In contrast, for players, gameplay is the means to fun. Thus, gameplay should be analysed to conduct the design analysis of fun.

We reframe the question posited in the introduction section of the paper – How do players use gameplay (the ludic form) to experience fun? The question can be approached by analysing gameplay. Of the several methods to analyse gameplay, as suggested by (Lankoski and Björk 2015; Dhamelia and Dalvi 2022), we use events as the analytical unit of gameplay.

EVENT ANALYSIS IS THE WAY FORWARD

In order to conduct a design analysis of fun, (Dhamelia and Dalvi 2022) show that analysing gameplay through events helps in the design analysis of player experiences. They argue that considering events as primitives of gameplay extends the scope of formal analysis of gameplay (as suggested by (Lankoski and Björk 2015)) and applied ludology (Järvinen 2007). While they suggest using events as a unit of analysis when studying fun in relation to the rules, conceptualising what events are and their relations to gameplay, fun, and players are underexplored.[6]

In this paper, pertaining to the design analysis of fun, i.e., analysing fun in relation to the rules, we aim to address the following research questions:

1. What are the events of the gameplay experience?[7]
2. How are such events created?
3. What are the different types of such events?

Answers to these questions would further the understanding of fun and player experiences in relation to the designed game structure. Given the goal of studying fun in relation to the game rules, the experience of fun needs to be studied along with the gameplay structure and the rules. Considering fun as a pristine experience of gameplay, one ought to capture the experience as close to the real-time and in the context of the gameplay. To achieve this, we need an idiographic method that allows researchers to study ongoing experiences as and when they occur in their natural settings. We follow a protocol developed by (anonymous, 2023) based on the Descriptive Experience Sampling Method (Csikszentmihalyi and Larson 2014; Hurlburt and Akhter 2006)

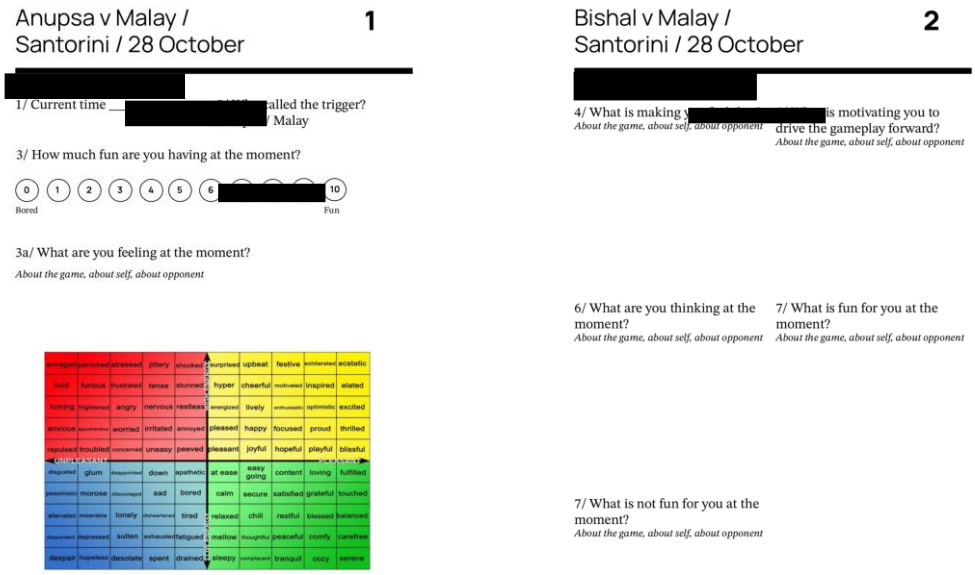
METHOD

The protocol is divided into three phases [8]– warm-up phase, gameplay, and sample elicitation. In the warm-up phase, the researcher explains the game to players and demonstrates the gameplay through a few turns. In the gameplay phase, the experience sampling method is employed to collect data, and in the sample elicitation phase, researchers and players re-construct and elaborate their gameplay experiences.

In this protocol (anonymous, 2023), researchers play the game with participants, and both respond to the sample collection sheet as used in studies employing experience sampling methodologies[9]. This sheet has three probing questions and four main questions which ask them to detail their current experience (as shown in Figure 1). The three probes that lead them to the main question are: ‘Rate the fun you are having at the moment, what are you feeling at the moment, and choose an emotion from the emotion meter. These probes place the players in the frame of their experience before the section, asking them to detail the experience in terms of gameplay. This section has five questions – what in the gameplay is making you feel that? What are you thinking at the moment? What is motivating you to drive the gameplay forward? What is fun for you, and what is not for you? These two sections comprise a sample collection sheet. When sample collection is triggered, both players – the researcher and the participant respond to the sample collection sheet.

In experience sampling methodologies, there are three ways to trigger a sample collection. First, it can be triggered at random times to avoid the expectancy effects that arise when participants are aware of the sample collection schedule. Second, to gather samples at a representative schedule of times, sample collections are collected at fixed time intervals. Both these triggers can create some anticipatory burden while playing games. A player might be interrupted from his stream of consciousness when the triggers are scheduled at random or at fixed intervals. In such a case, (Rhee, Bayer, and Hedstrom 2020) suggest the use of event-contingent triggers for sample collection. We chose event-contingent sampling, wherein either player – the researcher or the player – could call the trigger when they experience fun[10]. When the sample collection is triggered, both players pause the game and respond to the sheet shown in Figure 1.

At the end of the gameplay, both players elicit and expand their experiences scaffolded through the experience samples. This phase allows players to re-construct their experiences, thus eliminating the chances of memory bias, peak-end effect, and recall bias seeping into the data. In this phase, the researcher employs semi-structured interviews to elaborate on parts of the elicited experience.



We applied this method to six games, played by two participants, distributed as shown

Figure 1: Experience Sample Collection Sheets

in Table 1. The names are masked with identifiers to maintain the anonymity of the author's country. In the final version, pseudonyms shall be used. Additionally, the first player mentioned in the table is a novice or "newbie" to board gaming, while the second one is an expert player or "pro" player. They are identified based on (1) the number of board games they played in the last month and (2) if they self-identify.

Game	**Participant Players** (P_R = researcher)
Pylos	P_BT versus P_R; P_AB versus P_R

Santorini	P_BG versus P_R; P_NG versus P_R
Azul	P_AS versus P_R; P_ZK versus P_R
Patchwork	P_IN versus P_R; P_SB versus P_R
Battleship	P_PO versus P_R; P_L versus P_R
Mastermind	P_KP versus P_R; P_NL versus P_R

Table 1: Game Selection for the Gameplay Analysis [2]

The primary analysis is conducted on the data collected in the second and third phases. For the first set of games, we conducted an inductive reflexive thematic analysis of the verbal responses during the sample elicitation [11]phase. The resultant codes and themes constituted the codebook for the data from the second set of games. We iterated the codes and the themes in the codebook while analysing the second set of games. Through analysis we propose the "player-centred event-focused gameplay experience mode[12]l" (figure 1). Using the model, we approach the research questions.

#	**Phase**	**Purpose**	**Data source**	**Data Channel**
		To record the gameplay	Play	Video recording
		To record in-game conversations	Play	Audio recording
2	Trigger—When one of the players calls to collect experience samples	To capture details about the events when one of the players experiences fun.	Experience Sample Forms filled by both players. Each ESF contains the following: 1) Likert scale of fun 2) Mood meter 3) Five questions	1) Likert response 2) Mood selection 3) Experience samples
3	Discussing the Experience Sample forms	To elaborate on the details about the events and the experience of fun.	Semi-structured post-game interview	Audio recording
		Arrive at the player's notion of the event	Think-aloud protocol	Audio recording
		Derive conditions of fun	Modified rule sheets	Rule sheets
		To understand the notion of fun	Interviews	Audio recording

		as a player experience.		

Table 2: Summarised phases of the study

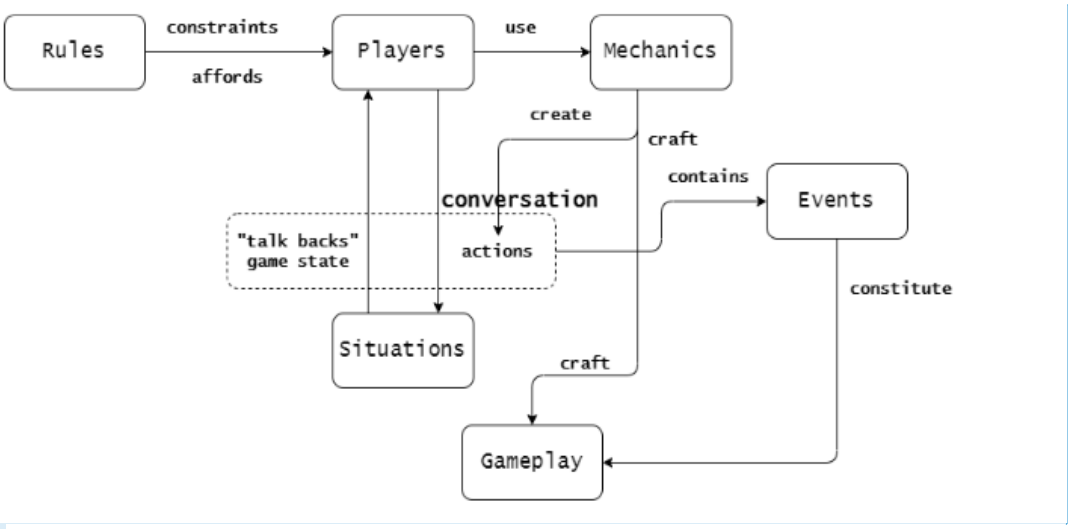


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Figure 2: Player Centered Event Focused Gameplay Experience Model

The model articulates and delineates the two intertwined ideas – "Player as a designer" and "Events". When playing, players follow the constraints and affordances of the rule set. Rules allow and prohibit players from taking certain actions in the game. In this model[14], rules are considered as instructions for interacting with the game system. Players use rules to create situations in the game. These situations, we argue, are similar to Schönian design situations.

Schön, using Dewey's sense of situation, considers situations as an environment where experiences and events happen (Schön 1992). To grasp 'design situations' in its entirety, one must understand Dewey's situations as a metaphysical and epistemological entity. Through design situations, we explain ways in which situations in games can be viewed as a special type of design situation.

A situation is a form of event where an actor can transact or interact (Dewey, n.d.; Brown, n.d.) with his environment. Dewey conceptualises situations as "environing experienced worlds". From this conceptualisation, we elaborate on three concepts related to situations. The "world" is to be interpreted as the contextual wholes, as opposed to the universal wholes. Within such a world, such a whole, there is a unity of meaning. A whole is meaningful in itself but might not have a complete, universal meaning; on the contrary, it has a complete contextual meaning. Such contextual wholes do not contain the whole meaning but only a part of the meaning, which is sufficient in itself. Within a situation, there are "a large number of diverse elements [objects and events] existing across wide areas of space and long periods of time, but which, nevertheless, have their own unity." Of the several elements, some objects and events, from the total complex environment, stand out because of their significance at a given time in relation to some problem, some goal, or enjoyment. An actor within

a situation, thus, has a *field* in which observation of some elements occurs. From this field, meaning-making occurs.

The second important concept is – "experienced worlds". This indicates that the diverse elements in the situations, and hence, the situations are experiential. In the case of Dewey, as (Brown, n.d.) argues, experience is a feature of practices or activities wherein organisms interact with their environment. Thus, experience involves the aspect of practices, activities, and acts of an organism; in Dewey's situational frame, without practices, there is no experience. The third concept important for the grasp of the situation is relevance. In Dewey's sense, a situation is "environing" in that, it forms the background and the environment for a practice and hence the experiences. While the environment is the total environment, situations only form a part of the environment – the part that the organism focuses on through its field of observation. Thus, the situation has a dimension of relevance, which is decided by the organism. Brown argues, "What determines the horizon of a situation is not a matter of distance in time or space, nor of mere causal connection. Rather, it is the relevance of something or event to some practice or activity that determines whether it is a part of a certain situation".

Design situa[15]tions, like Dewey's situations, are contextual wholes with which a designer transacts or interacts; additionally, as Schön argues, they are also material ones. This makes design situations different, albeit a unique type of Dewey's situations. Within a design situation, a designer, through her field of observation, finds and makes some elements (material objects and events) in the design context (the environment) more significant than others. Schön proposes that designers apprehend the design situation through sensory appreciation. This sensory appreciation is practice-based, for he argues that the sensory appreciation can occur on-site or while she is operating in the virtual world. In other words, she experiences the environment through her practices and material manipulation. These practices, as Schön argues, are conversations of designers with the materials of the design situation. Broadly speaking, Schönian designers make a move, reflect on that move, and make a move again. Each move is a change in the configuration, which has the potential to transform the environment. The move also contains elements of practice. Thus, a move is not only a part of the process but also a part of the situation.

LUDIC SITUATION AS A DESIGN SITUATION

In board games, when players interact with the game system by following the rules, they reside in Schönian design situations. Such situations constitute the gameplay (similar to Dewey's environment and Schön's design context). A player, through her field of observation, gives importance to certain objects and events while playing; game goal helps players in doing so. A player makes moves mentally by exploring the possibilities, re-evaluating the possibilities, and then making a move, thus changing the environment and creating a new situation for the other player. Another player perceives this design situation and transacts with it through his moves. Thus, players creating and responding to the design situations create an instance of gameplay. In the lines of Dewey and Schön, we propose such player-created design situations as ludic situations.

Ludic situations are experiential, and they are relevant to a player and the gameplay. A unique and endemic characteristic of ludic situations is that these design situations are created by players using the game rules. Since gameplay consists of situations, players construct the gameplay. This view allows us to understand the gameplay as a constructed, designed property along with an emergent one. In this sense, players can be considered as Schönian designers. The interactions of players with the situations and thus constructing gameplay, we propose are the ludic events.

LUDIC EVENTS AND THEIR NATURE

Events can be considered objects in time (Maienborn 2019). In the case of gameplay, they can be seen as changes in game states in time. Game states are structural, formal, and procedural properties of the gameplay and dynamics containing information about rules and player actions. Metaphysically, states are static in time and space. They represent the particular state of the system at a particular time. In board games, these states are represented as positions of pieces and the board after a player action. On the other hand, events are player-created changes in states. However, there are crucial differences between events and states. It is through this comparison that the nature of ludological events can be understood.

The primary difference is the player's perspective. Game states are a formal and systemic property of the dynamics. Game states contain little information about the player and her experiences with respect to the game states she has created. On the other hand, gameplay events are player-centric. States occupy a position in space and time, while events can happen anytime—during, after, and before the creation of states. For example, while playing *Chess*, the game state is changed when one of the players makes a move and changes the configuration of the game board. Meanwhile, events occur in the player's mind with respect to the game state. Affect, experiences, and aesthetics in games need the player's creation, and they can happen anytime during the game. All players triggered an event when they experienced "a moment". In the explication phase, when asked the reason for their trigger, the common characteristic was when they "saw", "figured out", "understood", "realized", and "reframed" something during the game.

They contain player perception, emotion, cognition, and decision of game states. In this sense, ludic events are phenomenological in nature. It is through identifying ludic events we explain the experience of fun in relation to the game structure.

SUMMING UP – CHARACTERISTICS [16][17]OF LUDIC EVENTS

Ludic events, thus, are phenomenological processes which a player undergoes when she interacts with the rule system. They are ways in which players experience the game system. While playing, ludic events are treated as a process, but once the game ends, those events constitute the gameplay structure, the ludic form. Thus, players create the events through which gameplay structure is constituted. In this sense, we propose that players are designers of ludic form. They design the ludic form, event by event. Thus, a ludic event is an element of the process as well as the form.

IDENTIFYING LUDIC EVENTS

The protocol discussed in the method section creates data, as shown in Table 2. We conducted inductive reflexive thematic analysis on the elicitation data and gameplay data, as suggested by Braun and Clarke, anchored with the research question and the nature of ludic events. First we enlisted the events identified from the six gameplays and then synthesised the event ontology of player experiences (shown in Figure 3). Through the event ontology, we explain the identified events and their role in creating fun. As mentioned earlier, in this model, we treat players as designers who craft the gameplay structure (the ludic form) event by event. Because of this central role of players in this ontology, the description and explanation of the model is player-centric.

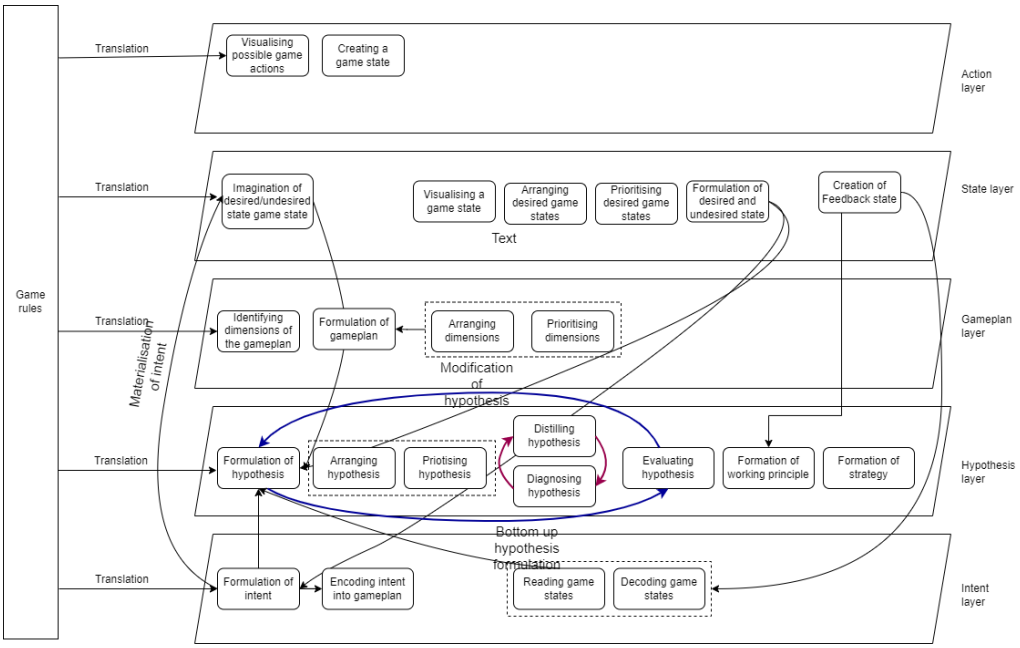

Figure 3: Event ontology of gameplay experiences

The gameplay, and hence the gameplay experience, begins when players read the rulebook. While doing so, players visualise and picturise the interactions that are possible in the game. Such an event is defined as *translation*. Players translate the rules to possible ludic situations – as to what kind of ludic situations and game states will emerge from the rule set (state layer) and possible actions (actions layer) to achieve or avoid the ludic situations. These visualisations and picturization lead to building a hypothesis about the game system and its behaviour (hypothesis layer) – how the system would behave on account of certain actions and what the effects of those actions would be. Players form a broad game plan (gameplan layer) based on their translations of rules to hypotheses, actions, and states. Lastly, the goal(s) of the game, as mentioned in the rules, are translated to the player intent (intent layer).

Game rules can be considered as a "bridge between the universals and the particulars" (Daston 2022). They contain the possibilities of potentially infinite

emergent gameplay particulars and interactions. Players, when they understand the rules, they mentally unpack those possibilities and interactions in the rules. They understand what can (affordances) and cannot (prohibitions) be done in the game; since the rules are artificial, players also reason out the existence of those affordances and constraints in the game. They formulate the internal truths of the system – "Are you sure we're allowed to pick two spheres from anywhere on the board?" (*Pylos*, P_AB). Thoroughly understanding these internal truths allows players to not only visualise the game system clearly but also make sense of it. Players cannot unpack all the gameplay particulars while reading the rules; they can only interpret certain effects and play according to the desired and undesired effects. In this sense, rules put players in this procedural rhetorical frame. For instance, in the game of *Patchwork,* P_IN wrote in his second sample (at the beginning of the game):

"I am unable to form strategies at the moment. I feel a bit confused about it. I think it is because I am unclear about the role of buttons and pieces. I think I should pay attention to buttons and pieces to see how they can and should be used in the game" (P_IN, *Patchwork, Written and explicated sample*).

When players encounter rules for the first time, they succumb to the procedural rhetorical frame. They can only imagine what they and cannot do in the game. Their agency is curbed during the play. However, during the play, when players have grasped the rhythm of the gameplay, experienced some of the gameplay particulars, and comprehended the systems better, players interpret and re-interpret the rules. In such cycles of interpretation and re-interpretation, players reframe the rules to their benefit according to the ludic situation presented to them. Following is an instance where a *Pylos* player (P_AB) got most of his spheres used up in the game. He experienced constraints as he interpreted the rule that allowed him to do something. However, he re-interprets the rule and reframes the situation presented to him:

"I just realised that you pick up a sphere on layer 2, thus freeing a sphere at layer 1. I do not know if you knew about this, but I thought that if I did this, you would be surprised. I realised the possibility and it was fun for me" (*Pylos*, P_AB, Written Sample).

When rules are re-interpreted, players experience a reframed reality. What was a constraint before, with little possibilities, now becomes a tool to create novel situations for the opponent. However, this re-interpretation is situational, i.e., in specific situations, players translate and interpret rules differently. During the play, players constantly undergo cycles of interpretation and re-interpretation of rules. By interpretation, we do not mean the rules are read differently or that they are changed; rather, players derive meanings of the rules differently based on the rules' situation at hand. We argue this cycle of interpretation-reinterpretation of rules allows them to further their understanding of the game system.

Since games are emergent systems, players can imagine and experience neither all possible gameplay particulars nor the details of gameplay particulars when they are learning the game rules. They only have a broad sense of the ludic situations that can be produced through the game system. This experience, equivalent to a form of verisimilitude, can be termed as *ludological verisimilitude*. Players, when learning the rules, approximate their idea of the system; when playing using those rules, their understanding of the system changes. Through the cycles of interpretation - re-interpretation, players try to further their understanding of the system but might not

completely understand the system and opponent's behaviours. In such cycles of understanding, forming a hypothesis is a significant experience.

To explain the figure 3, we explain layer-wise, the events and associated experiences

INTENT LAYER

After learning the rules, an important aspect players dwell on is – what should I do? And what should I desire in the game? Because the gameplay emerges and unfolds, a player, when learning rules, can only gauge that structure and will not have experienced that structure. This gauged idea of the gameplay – what gameplay might look like – becomes the object towards which a player's attention remains, and this structure makes up the meaning for the player. Based on this gauged idea of the rules and possible dynamics, a player forms a larger intent. When players form intent, they form their positions, their attitude of playing the game and towards the opponent, and their desires in the game. In this theory, intent is a core driver of player actions, a quality created by game rules, and the basis of fun as an experience. In this theory, we unravel some ways in which the game creates and sustains the intent of players.

We argue that in games, the fun lies in cycles of *intent formulation*, *gauging the intent* of the opponent and that of the system and *breaking the intent*. At the core of the experience lies the intent – players play through intent, which keeps them aware and conscious (situationally, spatially, temporally, and attentionally), and this way keeps them analytical and reflective about their actions in the game. This theory also posits that it is this very formulation of intent and desire that creates and germinates other events – the first of them is the formation of hypotheses.

HYPOTHESIS LAYER

Players form an understanding of the game system through gameplay particulars. They form hypotheses about the game system and about the players. Hypotheses are tentative understandings of the system as well as the opponent. Hypotheses are ways of exploring the possibilities that can emerge. Players, in order to form hypotheses, process rules to identify goals and desired game states that can be achieved in the game. The hypothesis is usually in the form of broad conjectures about an effect a player can create through their actions. P_TR, a player of *Pylos,* explains "I want to create a pattern at the base which does not allow P_AB to form any patterns at that level. It is important to do that at the base level because that is where there are many possibilities." Here, P_TR formulates that obstructing a player at the base is important and a pattern, when formed at the base, can help in achieving that. Three dimensions of a hypothesis are present here. First, a hypothesis does not contain actions, but it contains ingredients of actions. Second, a player has to derive those ingredients of action. In the above hypothesis, a player derives a personal, immediate and local goal based on the game rules and goal. A player forms the local, immediate goal and also derives a desired game state. The desired game state and the local personal goal are the ingredients for the player's actions. They are almost actions, but they are not actions; however, they contain ingredients which will direct the player's action. Third, it contains the player's desired game state or the intended effects – what a player wants to achieve. In the hypothesis in the discussion, P_TR imagines the effect as obstructing the opponent and hopes that the pattern will help in achieving that effect.

To form hypotheses, while experienced players focus on the desired game states as they are aware of the possible actions, players who have just encountered the game focus on the finding ingredients of actions – identifying desired game states, forming local goals, and evaluating the hypotheses. Both types of players – novice and experienced, arrive at a singular hypothesis from several hypotheses, evaluate them, arrange them, distil them, and prioritise them. In these events, a player evaluates the hypotheses for their consequences and refines them by arranging and prioritising the hypothesis. In *Patchwork*, for instance, P_SB explicates, "I was focusing on gaining the buttons in the beginning, but then I was missing on pieces. So later I thought, I should focus on pieces that are fitting nicely and are chunky". Of the many hypotheses a player formulates, some of them gain priority based on the ludic situation presented to the player. Similarly, players also arrange hypotheses relative to each other. The same player of *Patchwork* says, "I was planning to gain the buttons first, then use them to gain more pieces"; this serial arrangement of hypotheses allows players to test them one after the other. A player experiments with such arrangements during the play and arrives at a hypothesis that she wants to test in the game.

FORMULATION OF GAMEPLAN

In order to test a hypothesis, a player then fixes on a set of actions in accordance with the rules of the game and her intent. We propose that a game plan is a set of permissible player actions in the game that need to test the hypothesis. It includes the turns of all players, each turn containing actions towards the respective player's understanding of the gameplay and thus formulated intent.

In order for a player to formulate the game plan, she needs to identify the operational and manipulatable dimensions. In other words, what are some dimensions that she can control in the game? These dimensions are concepts and ideas in the gameplay, and players surface from the rules while forming a game plan based on their intent and hypothesis. In *Azul*, players realise that claiming the first turn order is crucial up until mid-game, which is an example of identifying the game plan dimension. Similarly, players identify early in *Battleship* that the arrangement of ships is a dimension that players can control and manipulate. These dimensions are actionable and tangible variables of the game which have situational significance. These are also the dimensions that players can play with. For example, in *Battleship*, players play around with the spatial arrangement of the ships to disguise two ships as one ship (as shown in the figure). In *Pylos*, players play around with the positioning of the spheres to create patterns that lead to the saving structures. These dimensions can be used offensively or defensively, but a player identifies, uses, and exploits them in the light of her formulated hypothesis. Just like these dimensions, players also arrange and prioritise these dimensions.

As discussed, dimensions have situational significance. For example, in *Azul,* when more than one player is securing tiles of a particular colour, claiming a first-player token becomes important. Similarly, in *Santorini*, realising that keeping the two workers together reduces blocking gains significance when one area of the board needs faster building. In contrast, in *Santorini*, it is also possible to separate the workers' buildings on different parts of the board. In this sense, players can use the dimensions of the gameplan in several ways. Our research suggests that players identify the dimensions and their use based on novel situations. When players identify a new dimension to play with, they experience the joy of discovery. For example, in *Pylos*, P_AB realised that if he picked the sphere from the top layer and freed the one

in the bottom layer, he could remove spheres from both layers. He finds this dimension fascinating as it can be used to surprise the opponent in novel ways. Gameplan dimensions have impending use when they are found. When found, they are present-at-hand; a player, generally playing the game by the rules (considering them ready-at-hand), now realises uses of the rules and the dimensions it create. [18]

To use such dimensions means to arrange and prioritise them and configure an assemblage of such dimensions. In doing so, the player realises the presence at hand of the dimensions. Such identification of the dimensions and their uses reframe the reality of the player, and now the player also holds the control to reframe the situation presented by and to the opponent. In this sense, gameplan dimensions are actionable in that they have instructions for the action to realise the intent. Unlike hypotheses, they are towards observable materiality that are game states.

ACTION LAYER AND GAME [19]STATE LAYER

This model treats game states differently than game formalism does. Instead of treating it a property of games, we treat it as a constructed property. Players create game states through their intent. In other words, game states are materialised intent.

Hence, when players formulate their game plan, they plan actions directed towards a desired game state. Upon formation of the intent and hypothesis, players imagine a desired game state, for which they configure the assemblage of the game plan. They perform actions under the formed hypothesis with the goal of reaching the desired game state. However, to formulate a desired game state, a player needs to visualise several game states first. In this event, players visualise the possible interactions and see whether the desired game state can be achieved. Depending on the possibility of the desired game state, players then reiterate and reframe their hypotheses, or their intent, or on the player's actions. We found that players also imagine an undesired state – a state that they should avoid creating and that is beneficial to the opponent or detrimental to their game plan. In both cases, however, the ability to imagine game states and form a game plan with actions is vital. While the actions are also material and tangible, they are the means to materialise the intent. In dexterity games, actions contain the information of the intent. For example, sports players observe [20]and evaluate an opponent's corporeal actions to gauge their intent. Hence, in dexterity games, we think it is possible for actions to contain the information of intent. In strategy board games, the intent materialises in the game state created by the player.

The hypothesis layer also encompasses another critical and associated event – expectant observation. When players formulate the hypothesis, in order to discard or accept the consequences, they have to wait several turns. During this time, the game state is like a partial object – it is created in mind, not created on the board; it is there, but not in a complete sense. Within such an event, the player waits for the consequences of their hypothesis and their framed gameplan. In this event, the player feels like a contraption designer who is curious to see whether the desired sequence of events occurs. In this event, players feel curious and, at times, anxious about the future because they have sketched a desired sequence of events and possibly a desired game state. In this state, the game state remains a partial object, which is there, yet not there. In this event, players observe the outcome, which is ambiguous. This wait time (or the duration of expectant observation) depends on the nature of the hypothesis formed by the player – that is, how far in the game will it show the consequences – and the game – what kinds of hypotheses the game affords.

The above event model of gameplay answers the types of events [21]in a gameplay experience. They are not exhaustive, and they are also limited by the games selected for the study. However, they certainly give us a broad idea of how games create fun [22]for players.

DISCUSSION

The proceduralist frame faces the epistemological challenge of studying fun in relation to game rules. Within such a frame, design research only studies game structure owing to the second-order design and analysis problems as discussed in the paper. However, we reframed the notions of design with which proceduralism works. In this paper, we move away from the notion of using games to deliver fun to players and consider players as designers of gameplay. While the idea of players as more than passive consumers of experiences has been voiced by several scholars (Taylor 2006, 133; Consalvo 2007), our ontology extends in two directions. First, scholars of game studies have considered players as creators of their experiences but have not detailed the manner in which a player does so. When we view gameplay as a ludic form which players craft using the constraints and affordances of the rules, we consider capturing the detail in which this occurs. This view of gameplay as a ludic form gives materiality to the idea of gameplay and the rules. In board games, rules are not only the set of instructions or procedures within which players reside, but they are the material conditions using which players craft the gameplay. We capture this process of crafting the gameplay by events. Second, players, as creators of their experiences, scoped this view to larger socio-cultural phenomena. Our focus is limited to in-game experiences. When players are considered designers in a game, we argue that it reduces the second-order distance between the rules and the experience.

The two shifts – players as designers and gameplay as a crafted property – afford us to shift the intent from the designer to the player. By identifying and synthesising events into an event ontology, we found out the player's intent plays an important role in understanding ways in which players use games to create fun.

Intent Obfuscation Theory in Board Games

Through this ground-up design analysis of the experience of fun in board games, we propose a theory of fun. The goal of this theory is to explain how board games afford players to create fun. We detail this theory using the events identified in the paper.

In this theory, we consider intent as the foundation of the player's experiences. The fun lies in gauging the intent of the opponent. In abstract strategy board games, since game states are materialised intent, players read the game states to decode the opponent's intent. However, in this theory, we argue that the game states are polysemic. They can embed multiple meanings and multiple intents. Hence, while decoding the game states for their intent, a player is usually not able to decode the complete intent of the opponent.

Game states are polysemic because of two possible reasons. First, the rules do not allow players to materialise their intent in one go[23]. Usually, it takes several turns and actions to achieve the desired game state and materialise the intent through the game state. Thus, a game state (even the intermediate game state) does not contain the entire intent of a player. It only contains a part of the intent. In this sense, too, this is a partial object – it does not embody the complete intent but has the potential

to embody the complete intent. To gauge the complete intent of an opponent, a player has to wait for the game state to completely reveal the intent. Second, the game state is created in the context of a specific hypothesis and a game plan. This is not known by another player. Thus, for a given game state, for a player not knowing the context, it can embody many meanings which a player has to construct in order to reveal the intent. For a player with a hypothesis and a game plan, it is crucial to hide her intent. In this theory, we posit that rules are specifically designed to achieve the polysemic nature of game states. The game rules allow players to hide their intent during the play. In this sense, the game obfuscates the intent of players. However, the game helps players to hide their intent only up to a certain point in the gameplay. Until then, for players, the fun lies in gauging the intent and constructing the complete intent from partial objects of game states.

As the game progresses, a player creates many game states. Given that game states are materialised intent, with the creation of more game states, players have more opportunity to decode the intent and build upon the previously decoded intent. Hence, as the game progresses, the players would be able to re-construct and gauge the intent completely. They have gauged each other's gameplan. It is not difficult to imagine that both the players would have decoded each other's intent completely at some point in gameplay. This zone, defined as the zone of critical intent interaction, is the climactic point of the game. During this zone, players not only know about each other's intent but also about how those intents will intersect when they will play further. Players feel that their strategies intersect. After this climax, we observed that it is mostly about the formulation and execution of the game plan. After the climax, the fun lies in observing and spectating who among the player and the opponent will craftily execute their game plan[24].

CONCLUSION

An important goal of design research is to understand the ultimate particular means to the ultimate particular ends. Through discussion, we argue that gameplay can be considered as an ultimate particular means for fun (the ultimate particular end for the player). This allowed us to reframe the question of design research – how does a game's design help in creating emotions and experiences – away from the proceduralist frame. We believe this reframing is a contribution to design research in game studies as it is of epistemological and ontological value.

Treating players as designers of the ludic form (the gameplay) allows us to see gameplay as a constructed and intentional property apart from emergent and structural property. Within this view, gameplay consists of player-created events. Using the experience sampling method, we identify events across five layers. This ontology, we believe, is the first player-centred ontology that attempts to explain gameplay experiences through empirical research. Through this ontology, we derive the intent obfuscation theory in board games, in which the player's intent is in focus, as opposed to the authorial intent of designers. Apart from shifting the intent from designer to players, player intent reconciles with and reinforces the stance of the player as designer of gameplay – which forms the core of the model and argumentation.

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ENDNOTES

[1] In this paper, we consider fun as a fundamental drive of games. It is considered as a gameplay aesthetic. We scope the idea of fun to in-game player's experience, as opposed to a wider prevalent notion in socio-cultural contexts. When treated as a gameplay aesthetic, echoing Sharp and Thomas (2019), we treat fun as a larger gameplay aesthetic than its cognates like engagement, flow, enjoyment, and so forth.

[2] In order to study player experiences in relation to rules, we chose the abstract strategy board game—*Pylos.* Abstract strategy games can be considered as pure rule systems who create

gameplays solely on the basis of player interaction with rules. Unlike the narrative games whose gameplay and hence the affect is driven by plot of the story.