

Making sense of studying games: using sensemaking as a perspective for game research

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Abstract

The study of games as research objects occurs in a vacuum. In this paper a possible theoretical perspective is explored that can be used to fill up this void. This perspective is based on theories of sensemaking. It is argued that the general properties of these theories have a natural fit with the characteristics of games, making sensemaking a potentially valuable perspective. The paper further outlines the implications of using sensemaking as a perspective for game research.

Introduction

Despite the relatively long history of game research - the International Association for Gaming & Simulation already exists for 40 years - the field struggles with the same issues it had in its infancy. Although the technological and societal possibilities for gaming have increased over the years, validity, efficiency, and effectiveness are still amongst the key issues in the field. Reasons abound of why it has been difficult to deal with this, from issues of generalization to the complexity of actually coming up with a proper methodology applicable to games (cf., Klabbers, 2006a).

A lack of rigor might, for example, be an important reason of why game research has been contradictory in its results. For this reason, Kriz and Hense (2006) proposed a more structured and comprehensive way of evaluating games called "theory-based evaluation." Such an evaluation procedure may, indeed, lead to more consistent and comparable results. However, to my opinion, the actual problem goes deeper. The study of games occurs in a "vacuum." With this I mean that games are studied without a proper framework onto which the results can be reflected on. It misses a theoretical underpinning.

To elaborate on this, a distinction needs to be made between games that are applied to explore or proof theories in an analytical science tradition and games that are used for intervention in a design science tradition (Klabbers, 2006a). In the first case, gaming is used as a methodology in itself. In the latter case, games are the object of study (i.e., the unit of analysis) and not a method by which more insight can be gained into another phenomenon. The vacuum I refer to is that there is little to no proper methodology - a way of thinking and doing - for studying games "an sich." This relates above-all to the design science tradition, as games are treated as a research object and not as a method of inquiry. Nevertheless, a methodology for studying games can enrich and lead to a gaming methodology that can subsequently be applied to explore or proof theories. This means that eventually both types of sciences could benefit from filling up the void (by means of "communities of observers").

To deal with the theoretical vacuum of studying games, we need to have perspectives, ways of looking, or a "pair of glasses" that we can use to investigate games. Only in this way we are able to interpret the results and give meaning to them. In this paper, I explore a possible perspective for game research. This

perspective is based on theories of "sensemaking".¹ These theories seem rather well suited to the study of games that simulate professional practices. In such games, the idea is that players learn or are made aware about something (i.e., design-in-the-large is attempted, see Klabbers, 2006a). To achieve this, they are immersed into a game-like situation in which they have to deal with challenges. Throughout the game, players get an increasingly better understanding of the subject-matter. In other words, they made sense of it.

In the rest of the paper I will further illustrate why sensemaking seems such a suitable perspective. To be able to do this, I first need to explain what sensemaking comprises. This is done in the next section based on four influential works. After answering the simple yet straightforward questions of "what is sensemaking?" and "why sensemaking?" some of the implications for game research are listed.

What is sensemaking?

Several influential works on sensemaking exist; in communication (Dervin & Foreman-Wernet, 2003), in organization science (Weick, 1995), decision making (Klein, Moon, & Hoffman, 2006a, 2006b), and in human-computer interaction (Russell, Stefik, Pirulli, & Card, 1993). Each represent a different perspective, yet share some common themes. The most important correspondence is that they are about how people make sense of their surroundings. As Weick put it, "the concept of sensemaking is well named because, literally, it means the making of sense" (p. 4). In this section I briefly explain each perspective and conclude with a set of general properties that underlie each of them.

Dervin's sensemaking

For Dervin sensemaking (or rather "Sense-Making" as she calls it) is a methodological approach to research and understand the communication and actions of a person. The approach assumes that "humans...live in a world of gaps: a reality that changes across time and space and is at least in part gappy at a given time-space (Dervin, 1998, p. 36). Dervin's sensemaking is seen as a movement of an individual through time and space, in which an individual seeks, uses, processes, and creates information to "bridge" these gaps to achieve certain outcomes. To build bridges, an individual will choose particular strategies based on his or her own information values, historical background, and culture.

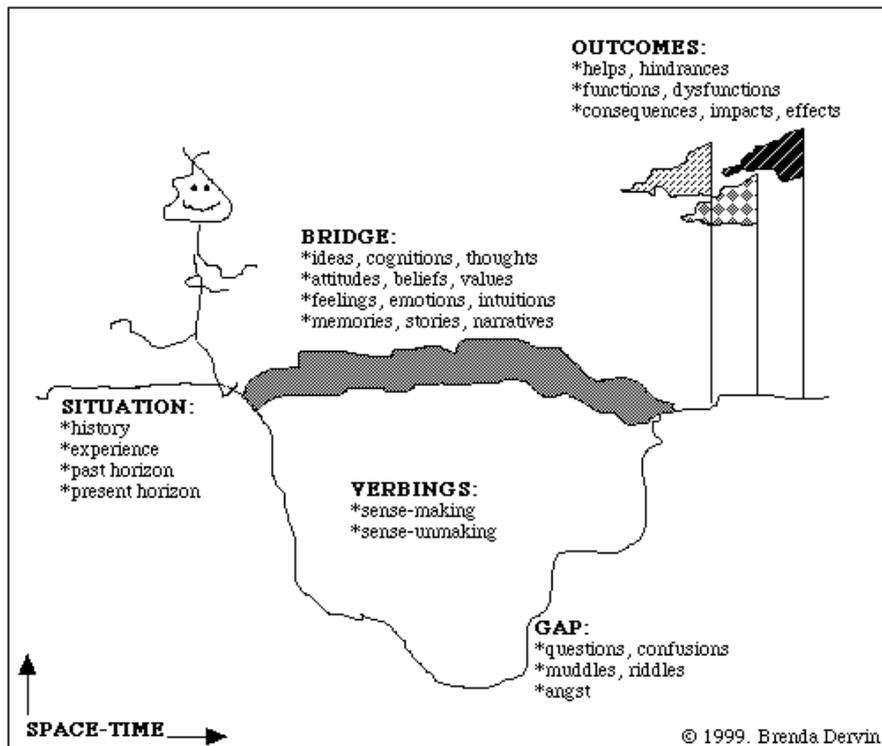
Although patterns are likely to be found in how people respond to situations, the assumption of Dervin's sensemaking is that reality will vary for an individual across time and space. Reality is seen to exist in constant sense-makings and sense-unmakings. To study this, it invites us to "enter the research situation in the 'in between,' between order and chaos, structure and individual, culture and person, self 1 and self 2, and so on. It focuses on how humans make and unmake, develop, maintain, resist, destroy, and change order, structure, culture, organisation, relationships, self" (Dervin, 1999, p. 45). It, therefore, assumes that a person is a carrier of both structure and agency and that there is a perpetual and dynamic interaction between the two (cf., Giddens, 1984).

Within the field of communication, Dervin's work poses a shift from the transmission model which focuses on messages being sent via channels from senders to receivers to an alternative model which focuses on the construction of the message (Dervin & Foremann-Wernet, 2003). What people make of messages is as important, if not more important, than the actual message. For this reason, Dervin's sensemaking is focused

¹ It is worth mentioning that a game has been used as a method to elaborate on the theory of sensemaking (Meer, 1983).

on the processes by which people bridge the gaps they encounter and not on the end results. By looking into the (sensemaking) processes an understanding can be achieved of the context of how people meet their challenges.

Figure 1 The sensemaking metaphor by Dervin (1999) of human beings confronted with gaps.



Weick's sensemaking

In contrast to Dervin, Weick (1995) looks at sensemaking as an ongoing collective activity. He places the activity between the "intersubjective" and the "generally subjective." In other words, in Weick's perspective sensemaking is examined as an interaction between individuals that are part of an organization and the organization (with its goals and culture) itself. This particular structure-agency tension is what makes organizational sensemaking different from everyday sensemaking. Although Dervin stresses this duality as well, it is one of many possible dualities in her perspective, whereas for Weick this is what mainly interests him.

Other close similarities between both perspectives contain the focus on the process (i.e., verbs instead of nouns) and the role of gaps. Weick does not see organizations as an object. This does not exist. An "organization" is continuously in movement. Organizations are composed of interlocking sets of behaviors performed by a collectivity and these change over time and space. So it is about "organizing" and not about "the" organization. This organizing is substantiated by sensemaking. Whenever people are confronted by ambiguous, equivocal, or unexpected situations (i.e., gaps in Dervin's terminology), they start to make sense. Moreover, actions of people and their organizations are propagated by the residue of their previous sensemaking (i.e., it is "retrospective"). These earlier sensemakings are inscribed in mental models and artifacts. They are also embedded in organizational systems (e.g., rules, policies, routines and habits).

To conceptualize sensemaking further, Weick (1995, pp. 13-14) stresses that sensemaking is just as much about "authoring" as about reading:

“To engage in sensemaking is to construct, filter, frame, create facticity...to sense something sounds like an act of discovery. But to sense something, there must be something there to create the sensation. And sensemaking suggests the construction of that which then becomes sensible.”

This authoring makes - amongst many other reasons (see pp. 6-16) - sensemaking different from making interpretations, which is more about “reading” the environment. Additionally, interpreting is just one of the steps that make up Weick’s conception of sensemaking. The complete (iterative) process of sensemaking consists of deciding (mostly unconsciously) of what to focus on and how to look at the world (i.e., the concept of “enactment”), extracting the important cues from the environment, constructing meaning based on these cues, making a (re-)interpretation, and implementing a certain action. This process is pushed on by the identity of the sensemakers (“I think differently than you”) and by plausibility (“I need to know enough but no more”). Important to add is that the process does not have a clear beginning and ending. For example, it could be that first a decision is made after which information is looked for to (dis)proof it.

Weick’s concepts and ideas involving sensemaking are of help in understanding organizational phenomena, such as improvisation and boundary objects, and situations, like the Mann Gulch disaster and how flight decks operate (cf., Weick, 2001). More importantly, Weick’s work provides a different view and scope of how to approach organizations similar to how Dervin’s work has provided a different view onto communication. Organizations should not be seen as static entities, but as ongoing interactions between people, (technological) artifacts, and other aspects that make up an organization.

Klein’s sensemaking

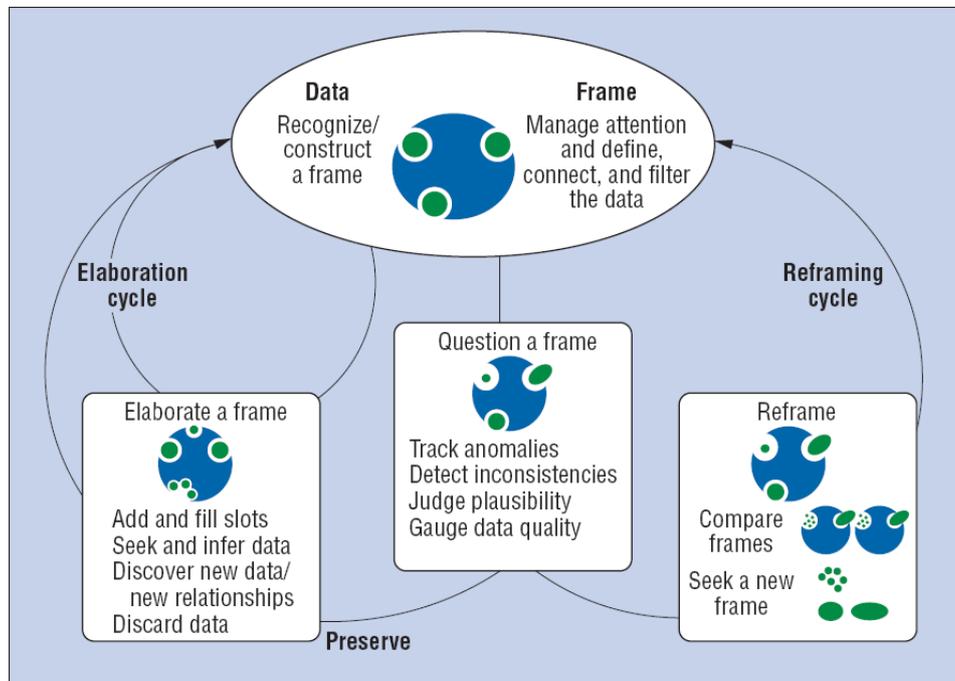
Klein’s look on sensemaking is more of a cognitive approach and is focused on the act of decision making. It is based on his idea of “macro cognition.” This term refers “to the collection of cognitive processes and functions that characterizes how people think in natural settings” (Crandall, Klein, & Hoffman, 2006, p. 136).² The assumption is that people make decisions differently when they are in a laboratory compared to a natural setting. Part of the reason is that the context in which tasks are carried out is important. This is also stressed in the idea of situated cognition (Brown, Collins, & Duguid, 1989), situated learning (Lave & Wenger, 1991), and cognition in the wild (Hutchins, 1995). One of the macrocognitive functions that play a role is sensemaking.

For Klein’s conception of sensemaking the concepts of mental models and situation awareness are closely linked (Klein, Moon, & Hoffman, 2006a). He sees sensemaking as something that “allows people to diagnose how the current state of affairs came about and to anticipate how it will develop in the future through the deliberate, conscious process of fitting data into a frame” (Crandall et al., p. 138). A frame is seen as some perspective, viewpoint, or framework that people use when they make sense of events. Frames include stories, maps, organizational diagrams, or scripts. This very much coincides with how people define “mental models” (Spicer, 1998). However, in Klein et al. (2006b) data/frame theory of sensemaking, mental models are part of a closed-loop transition sequence together with *mental simulations*. The mental models are considered backward looking and explanatory, while mental

² Microcognition involves the “basic” and universal features of the way people think, such as determining whether attention is serial or parallel. These phenomena are best studied under laboratory conditions, not in the field.

simulations are forward looking and anticipatory. The theory further separates sensemaking into four related activities: recognizing data and managing frames, elaborating and preserving frames (akin to Piaget's assimilation), reframing frames (akin to Piaget's accommodation), and questioning frames.

Figure 2 The data/frame theory of sensemaking by Klein et al. (2006b).



The data/frame theory of sensemaking and its underlying ideas can be used to better understand how novices, but in particular how experts make decisions in complex, real-world contexts. Furthermore, it can be applied to develop and improve information systems, such as a weather forecasting decision support system, to guide decision making processes. Compared to Weick's ideas, Klein's sensemaking applies foremost to individuals and small groups. In addition, it has a relatively shorter time scale. Organizational sensemaking can take days, weeks, or even months, while (recognition primed) decision making takes minutes or hours.

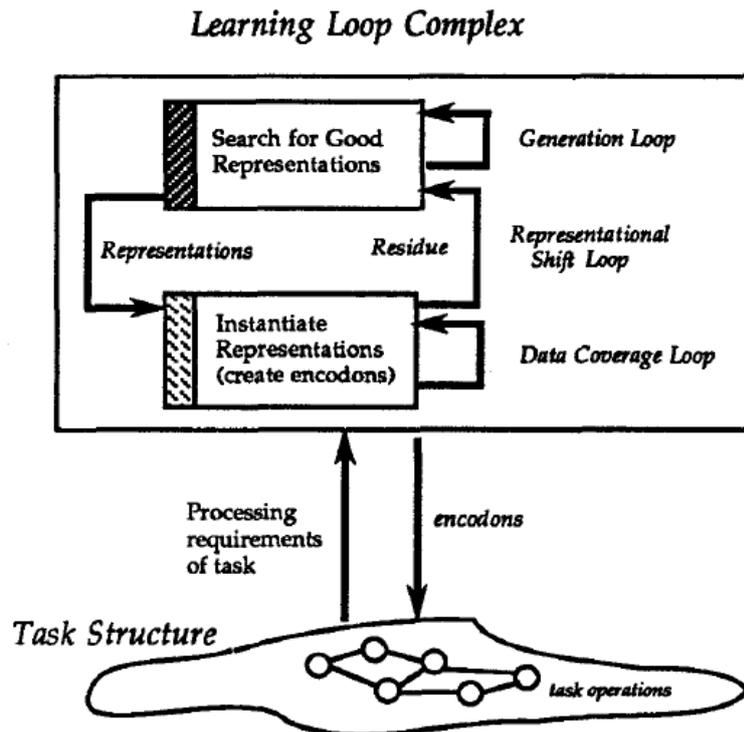
Russell's sensemaking

The type of sensemaking Russell et al. (1993) are interested in relates to an even more refined area and one that can consist of an even shorter time scale in comparison to Klein's sensemaking. It is centered on information processing related to the usage of information systems. More specifically, it is about how the design of user interfaces, information retrieval and representation using systems can be improved. This is for example about reducing the costs (as in time, quality, and effort) to search for information on the Internet. They argue that understanding the process of sensemaking is an important way of reducing these costs. They defined sensemaking as "a process of searching for a representation and encoding data in that representation to answer task-specific questions" (p. 269).

To research this, Russell et al. developed a sensemaking model (see Figure 3). This model consists of a "learning loop complex" with three main processes. When sensemakers are confronted with a certain task, they initially search for representations that they think could support them in accomplishing the task. This is

the “generation loop.” During the “data coverage loop” information of interest is identified and encoded into an “instantiated representation” based on the representations from the generation loop. The eventual instantiated representation (consisting of “encodons”) is used during the task. The “representational shift loop” comes into play when “residue” exists. Residue is ill-fitting or missing data and unused representations. If this is the case, representations may be merged, split, or new categories may be added.

Figure 3 The sensemaking model of Russell et al. (1993).



Russell’s sensemaking model shares much similarity with Klein’s data/frame theory of sensemaking. While the first is about fitting data into representations, the latter is about fitting data into a frame. The most important difference is that the work of Russell is solely focused on information systems, the use of visuals, and improving the effectiveness of searching information during problem-solving, whereas Klein’s application of sensemaking extends beyond this as information processing is an element of decision making. An added value of Russell’s perspective is their attempt to formalize the process. This makes it possible to evaluate processes in terms of costs and effectiveness.

General properties

To look into the possibility of applying the idea of sensemaking as a perspective for game research, four influential works in different fields have been chosen. Although other scholars may have applied notions of sensemaking in their work as well, such as Choo (1998), these are closely affiliated with one of these four works. For this reason, this analysis can be considered comprehensive. An overview of the works of Dervin, Weick, Klein, and Russell is shown in Table 1. This table summarizes the differences between each work. It can be seen that they are rather comparable in a broad sense (e.g., frames vs. representation). In fact, aside from differences in

perspective, level, and especially focus, the works share many properties. Let me summarize these as well:

- **Process orientation.** Each of the works focuses on the process. It is not about what happened, but rather “how” what happened. How people build bridges, organize themselves, make decisions in complex, real world tasks, or retrieve information is what is important. It is about what occurs “in between.”
- **Ongoing.** All of the works stress that people make sense all the time. It never stops. When one gap is crossed, another is about to be found. The world is not static, but dynamic. Representations shift, just like frames or mental models. Sensemaking occurs in a loop. Depending on new experiences, new information, and other characteristics, previous sensemakings may change, opening up a whole new world of possibilities that need further investigation.
- **Challenging.** Challenges are central to sensemaking. We make sense when confronted with “gaps”, when we are in ambiguous, equivocal, or uncertain situations, when we have to be make decisions, or when we have to look up information and process this. In each activity, a challenge is defining what is being done. If no challenge exists, there is no need to make sense.
- **Contextual.** Sensemaking is not an isolated process. It occurs in a certain context. The history, culture, but also previous mental models, the task at hand, the information systems used, and so on; all of this determines how people make sense of a situation. While in particular Dervin emphasizes the time-space influence on sensemaking, the other works make this clear as well. Klein stresses this in his idea of macrocognition: we think in the context we are in. Weick point this out in his concept of identity, while Russell indicates that the task structure and possible external visualizations influence the sensemaking process.
- **Agency-structure duality.** Every work reconceptualises human beings as passive receivers towards ones that actively influence their environment. Human beings, as Weick metaphorically describe them, are authors of their sensemakings. Nevertheless, structures, such as routines, cultural values, etc., are inscribed into people (by means of verbings, enactments, frames, or representations). They are of influence as well. The duality between the agency of the ones that makes sense and the structure surrounding them, gives an interesting tension. Will a person act according to plan or improvise and come up with something completely else?
- **Mental modelling.** Apart from the relevancy of outside influences, sensemaking is above-all seen as something “mental.” Aspects that involve sensemaking, like ideas, emotions, stories, memories, and perceptions, are basically cognitive elements. This does not mean that the “body” has no function in theories of sensemaking. When communicating people use gestures, when expressing emotions they use their body, and when looking up information people are bounded by their own body. Nevertheless, it is the mind where meaning is created. This is essentially what sensemaking is about.

The five above-mentioned general properties are being related to the core concepts of gaming in the next section. This way, it can be assessed to what extent sensemaking might be considered as a perspective for game research.

Table 1 A comparison of the four works on sensemaking.

Work Item	Dervin	Weick	Klein	Russell
<i>Perspective</i>	Cultural-historical	Managerial	Socio-cognitive	Cognitive
<i>Level</i>	Individual	Collective	Individual or group	Individual
<i>Focus</i>	Communication	Organizing	Decision making	Information processing
<i>Driver</i>	Verbings	Enactments	Frames	Representations
<i>Trigger</i>	Confrontation with gaps	Ambiguous, equivocal or uncertain situations	When decisions need to be made	When information is looked for
<i>Contribution</i>	Construction of the message is important	Organizations consist of ongoing interactions	Sensemaking is relevant for complex, real world decisions	Assessment of cost structure of sensemaking for information systems

Why sensemaking?

In 1974 Duke wrote that (p. 11):

“gaming is a future’s language, a new form of communication emerging suddenly and with great impact across many lands and in many problem situations. This new communication form represents the first effort by man to formulate a language which is oriented to the future. This future will in all certainty differ dramatically from the past, and the languages which have passed to us from antiquity will no longer suffice.”

When Duke was writing these words he was not thinking about entertainment gaming. Rather, he envisioned a use of games to simulate professional practices or to be used as analytical tools. He suggested that games might offer a possible answer to the problems of an ever increasing complex society. To see to what extent games are capable of simulating this complexity is one research question that is worth investigating (cf., Bekebrede & Mayer, 2006). Another is looking into what type of “new form of communication” gaming is and how it needs to be researched. These ontological and methodological questions, respectively, can be answered in many ways. In this section, I will relate the general properties of sensemaking to games and argue that sensemaking seems to have a natural fit with games and, therefore, can be a potentially valuable perspective for game research.

Process orientation

Rules are an important characteristic of what scholars consider to be “games” (Juul, 2005). The most important rule relates to the “goal” *in* the game (i.e., design-in-the-small, see Klabbers, 2006a). To give feedback about this goal, games frequently adopt scores as an indication of how well players perform. While these scores are a

motivating factor and a stimulus for a good debriefing, the scores in themselves are almost never the goal *of* the game (i.e., design-in-the-large). It is true that certain applications of games for professional practice can be found, in which players get a certification (or not) based on their performance. However, mostly, the actual goal of the game is some learning experience. This learning experience is not specifically tied to scores. In fact, someone with a low score may actually have learned a lot. With games it is not about the end result, it is about the process of how players move from A to B. It is about what happens “in between.”

This focus on the process is exemplified by the term “procedural rhetoric” coined by Bogost (2007) to express the power of games. Games consist of rules and by manipulation of these rules a “procedural representation” is created. For example, by planting a factory next to a village, the population may decrease, because people decide it would be better to move to another village. This whole decision “process” gives the player a (procedural) representation, which can have rhetoric. In this case, it would be to indicate that as a planner it is not wise to build a factory close to a village. Games are characterized by these sorts of (interactive) processes. For this reason, Bogost places an important emphasis on the procedural nature of games. This is what makes them different from other forms of communication.

It also explains why processes of games should be considered more carefully in research. Sensemaking, as explained before, has such a process orientation. By using it to study games, it may help to get a better understanding of how the processes evolve, inside the player’s head in interaction with the game and the environment. How do people make decisions in games and how do they process information from games? The first question could be answered by applying for example Klein’s work to games, while the latter can be looked into by using Russell’s framework.

Ongoing

Throughout a game experience, players may need to rethink their initial ideas or strategies related to the game. Especially when the game involves multiple players, it is almost never completely the same. If the game allows for it, it depends on the context and the interaction between players for what kind of game experience emerges. The game of *Chess* comes to mind. Despite that it only involves one other player, both players need to continuously update their strategies to not get defeated.

Even when it involves a singleplayer game, new enemies and/or new environments may push the player to rethink their strategies or ideas about the game. A concrete example involves the game *Braid*. In this game, the player has to use the element of time to solve puzzles. In each of levels the way the time can be used is different. In one level, the play can rewind time; in another he can delay it. Every time players are confronted with a new game-play element, it requires them to make sense of how this helps them to solve the puzzles. For this, they need to elaborate, question, or reframe their frames (or in Russell’s terminology, a representational shift loop will occur).

This means that playing a game does not necessarily lead to a single and/or static conception of the game (unless the game is static and provides only a single image). A game has quite often many possible outcomes, and even if it has a single outcome, the path to it may differ incredibly. To “win” the game, people need to be sensitive to the game’s context, change their strategies when desired, and/or rethink their ideas and concepts related to the game. How and for what reason players change their initial or previous ideas about the game, is a relevant and contributory question to better understand the process of a game. Sensemaking could provide a valuable framework onto which the ongoing property of games can be explained by.

Challenging

All games involve challenges, whether it is solving puzzles or shooting enemies (for a list of challenges, see Adams & Rollings, 2003). Adams and Rollings define game-play even as “challenges + player actions”: it consists of confrontations and the abilities of a player to deal with them. Every time players are confronted with a challenge, they basically face a gap or a situation in which they have to make some decisions. This is where the sensemaking starts. This is especially notable in those digital games that include end bosses. Most of these end bosses have certain weaknesses that have to be discovered. These weaknesses have to be coupled to a strategy that the player can employ. To discover this, the player more or less has to make sense of the situation.

This means that the object of study in sensemaking is comparable to what games have to offer. Games offer subsequent (or sometimes only one or two) challenges that need to be taken care of. Therefore, how people deal with challenges is at the core of sensemaking as well as games.

Contextual

A quote by Duke (Caluwé, Hofstede, & Peters, 2008, p. 27) is that “a game is worth ten thousand pictures.” This quote is an assumption of the power of games. It extends on the popular saying, proofed scientifically by Larkin and Simon (1987), that “a picture is worth ten thousand words.” The central idea (with games as well as pictures) is that much more information can be conveyed compared to other forms of communication, because it makes the issue being discussed more concrete. In contrast to pictures, games actually *situate* users into something. This makes “situated learning” (Lave & Wenger, 1991) possible and explains why Duke is convinced that games are more powerful than pictures (see also Gee, 2003).

The observation that games provide a context is quite obvious. This is partly what makes a game a game. The question remains what to do with it, empirically as well as design wise. For this, it is helpful to get an understanding of how the context creates an added value. In other words, how does the game’s context impact the player and how can designers accentuate this (by for example building in cues into their scenarios) for improving the game’s effectiveness? To answer this, it might be helpful to use sensemaking as a perspective. As explained earlier, the works surrounding sensemaking look into how the context affects people’s behavior. Such study can easily be transplanted towards the behavior of players.

The context considered by sensemaking is not bounded to only the context of the game itself (i.e., the game world). The context in which the game is played is just as relevant. With this, I refer to the identities of the players, their culture, and history. Due to the richness of games, many factors can have an influence on the game’s process and outcomes. To achieve a better understanding of the use of a game, a more thorough and extensive study needs to be made of these and other contextual variables (cf., Kriz & Hense, 2006). Sensemaking stresses this as well. On top of that, the theories underlying sensemaking also give an elaborate explanation of why they need to be considered.

Agency-structure duality

Despite the possible freedom (and flexibility) that games may offer, they are in essence structured artifacts. They consist of rules and have a certain context, goal, and model behind them. The structure of games is helpful to frame the situation and bring up relevant issues that the players need to deal with. Nevertheless, players are more or less bounded by this structure. They cannot fly if this is not part of the rules. If players are able to do something else, this may seriously distort the intended game

experience. The example of the interactive storytelling "game" *Façade* brings this to light. In it, a player plays the role of an old college friend of a couple that is in the middle of a relationship crisis. The idea is that the player acts as a mediator. However, from the several scripts that players submitted, it can be clearly seen that players do not stick to this. Although not following the role description can be fun and a way to experiment with the limitations of the game (and its technology), it makes clear that a game experience stands and falls with the input of the player. This shows that games have an inherent interesting tension between the structure of the game and the player's input.

This tension can be found in what is considered one of the essential characteristics of games (and ICT technology in general): interactivity. The ability to communicate with a "system", give input, receive feedback, and give input again, is what drives many, if not all, games. Games are unlike TV or movies not linear. The non-linearity is dependent on the input of the players. The latter can be considered "agents" that bring their own ideas, conceptions, and experiences to the table. Due to the many differences among the agents, they may "interact" quite differently with a game resulting in many different game experiences. The duality between player(s) and game resembles, therefore, the agency-structure duality that characterizes sensemaking processes.

Examining this duality is worth investigating. As a designer of games to simulate professional practices the intention is to create a certain effect beyond the game (Harteveld, Guimarães, Mayer, & Bidarra, forthcoming). To achieve this effect, the designer has to consider the agency and the structure of a game. How do the two aspects need to be balanced to maximize the effect of the game? In contrast to this designer's point of view, it would from an analytic point of view just be interesting to look into how players deal with the structure they are given (in terms of the game and their mental models).

Mental modelling

Games can be found that are used for training physical skills, such as eye-hand coordination, or other purposes that are not mental. Nevertheless, the large majority of games that are used for education, training, business, or other professional practices, are aimed at the human brain. More specifically, they attempt to "change" the mental model of the players. For example, an urban planning game aims to give the player an elaborate view of all the factors involved in city planning and how they interact with each other. Initially, the designers created a "mental model" of the game and implemented this in a game setting. Subsequently, it is up to the player to play around with this model and elaborate, question, evaluate, compare, and reframe their frames with this model. Training, as explained by Klein et al. (2006b) should be aimed at increasing the range and richness of frames, in particular of causal mental models and the skill of noticing anomalies. This is what most of the games attempt to do. They want to increase the richness of mental models and the sensitivity towards elements in reality (whether this would be buying a certain product in a shop or noticing a defect in a factory).

This basically means that most games are in fact "sensegivers." They need to assist players in the making and unmaking of sense. The difference with real world experiences is that this is done "virtually" in a safe, quite often simplified "magic circle" that allows for experimentation and possibilities that may not be possible in reality (e.g., simulating a crisis). These and other (potential) benefits (c.f., Gee, 2003) may ensure that players can (re-)create and elaborate their verblings, enactments, frames, or representations related to a certain subject in a possibly more efficient and more effective way than by any other means. To see how this

happens and how it could be improved a perspective like sensemaking might be of assistance. Sensemaking might be particularly relevant due to its similar focus on mental modelling.

Implications for game research

In the previous section, I related six general properties derived from theories of sensemaking towards games. From this, it can be seen that the characteristics of games fit (almost) naturally with the properties of sensemaking. Of course, it can be argued that any set of theories can be applied to games and seem to fit naturally. Games are versatile objects. The kaleidoscope of disciplines involved in the study of games (Klabbers, 2006b) proves that a large set of perspectives are possible onto games. This means that many more perspectives may have a "natural fit" with games (for another perspective, see for example Lainema, 2009). However, the point to be made in this paper is that sensemaking is one of them considering that it *has* a natural fit with games.

Leaving this discussion aside, what are the implications of using sensemaking as a perspective for game research? These implications are summarized below:

- **Theoretical framework.** First of all, sensemaking provides a theoretical framework onto which the observations of a game can be explained with. Many discussions about games are frequently not thoroughly theoretically embedded. Sensemaking provides an opportunity to change this. It reframes games as a meta activity focused on assisting people that make and unmake sense. For example, how and for what reason something happened in a game can be related to one of the works outlined in this paper.
- **Focus on the process.** Studies frequently adopt pre- and post-tests. The use of this may neglect what happens "in between." Although researchers may be able to trace back what could have happened, it actually negates what is most important to games. Studies into games need to (re-)focus more on the process by using a "process approach" (cf., Klabbers, 2006a).
- **Comprehensiveness.** Many (contextual) factors play a role in sensemaking, also in how people make sense during a game. Researchers need to spend more time and effort in investigating these factors by getting a more *comprehensive* understanding of the player and the situation in which the game is played.
- **Interpretative and phenomenological.** Using sensemaking it means that researchers perform an interpretative and rather phenomenological type of research (cf., Mallon & Webb, 2006). Reality is not objective, but (socially) constructed. Additionally, looking into sensemaking it follows that "subjective" experiences related to the consciousness of people are investigated.
- **Qualitative and quantitative.** Considering the above, solely using quantitative may not lead to the sort of understanding that is looked for. To get a better understanding of the context and achieve a "thick description" (Geertz, 1973), qualitative methods need to be used, like interviews. Quantitative methods can be used to strengthen the evidence provided.

- **Loosely structured.** Dervin (1998) stresses that in order to understand how people make sense of events, it is crucial to approach the participants with an open attitude. Researchers need to seek for *dialogue* rather than control. Sensemaking focuses on how a person deals with a particular gap instead of trying to develop a picture from our own understandings

The above-mentioned implications are probably not all-conclusive. They, nevertheless, give a first good impression of what it means to use sensemaking as a perspective. This perspective can be used to understand what happens during a game, and subsequently, if needed, to understand how the game can be improved. When considering sensemaking, it depends on the focus and scope which of the four discussed works seems most applicable. Dervin's should be considered when it is about communication, Weick's when it is about organizing, Klein's when decision making is what matters, and, finally, Russell's if it is about information processing (see Table 1).

Conclusion

The study of games occurs in a vacuum. This might be one of the reasons why it has been difficult to attribute meaning to the results of several studies that attempted to investigate games. In this paper I proposed and explored a possible perspective that may shed light onto game research. This perspective is based on theories of sensemaking, namely Dervin's, Weick's, Klein's, and Russell's work on sensemaking. From these works, I retrieved six general properties: process orientation, ongoing, challenging, contextual, agency-structure duality, and mental modelling. These general properties are characteristic of what is considered as "sensemaking." I have shown that these properties are important and characteristic to games as well, making it seem that sensemaking has a natural fit with games. I further outlined the possible implications for using sensemaking as a perspective. Other than that it forms the needed theoretical underpinning to study games, such study will focus on the process, needs to be comprehensive, is framed in an interpretative and phenomenological paradigm, uses qualitative and quantitative methods, and is from the outset loosely structured.

I want to stress that this paper is a first attempt of connecting sensemaking to games. As a methodology and/or perspective on games, it needs a much further refinement. I need to elaborate, question, and reframe the framework positioned in this paper. A second step would call for an operationalization of how sensemaking could be applied in practice. The third and final step would be to actually apply sensemaking as a perspective to evaluate a game. This way, it can be concluded whether game researchers really "make more sense" of what they study by using this perspective.

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