The Order of Play: Seeing, Teaching, and Learning Meaning in Video Games

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ABSTRACT

This paper explores the locally-produced meaning-making practices of video game players, taking the position that the contingent properties of situated actions play a significant role in the construction of meaning. The participants of this study are Asian adolescents from China, currently studying in New York City, who play video games after school. There are four participants in the following example: Jason, Andrew, Kevin, and Li. As Li was a novice player to the game, her participation yielded interesting insights on the underlying assumptions that both expert and novice players possessed. In particular, it reveals that the expert players had their own definition of proper play that they needed the novice to understand, and the initial failure to communicate with the novice showed that the experts' interpretation differed from that of the novice. The study is guided by ethnomethodology, an approach that has been applied to many studies involving human-machine interactions, and has been increasingly important in helping us understand how people make sense of environments that involve different interfaces and equipment.

The findings show that, even when their interpretations of the action diverge from the game designers' intentions, these interpretations continue to make sense within the context of their interaction. The findings also highlight the importance of describing these meaning-making practices as they emerge in situated time, as they demonstrate how players are able to comprehend one another in an inherently ambiguous environment. It demonstrates how players' actions are shaped by their social relationships and are continually refined and clarified by the ongoing deliberation with other players. These findings can help future educational researchers better understand the process of learning in virtual environments, the role of social interaction during play, and can potentially improve our approach towards designing better games for education.

Author Keywords

meaning-making, order, design, ethnomethodology, learning

INTRODUCTION

Despite the growing number of studies on video games, there are still gaps in video game research, especially when it comes to describing the situated (in situ) actions of gameplay. The complex designs of games and social relationships between players pose challenges to researchers who wish to describe how players experience and construct meaning as they are playing.

Squire [18] refers to video games as "designed experiences," where players learn by being immersed in worlds that represent the ideological choices of the game designers. These worlds refer not only the visual environment, but also the rules of the game, which constrain the actions of the players and determine what moves they can and cannot perform. Game designers point out that part of the fun of games is having the ability to get away with actions that we cannot perform in real life [16]. Thus, video games often do not follow the same type of physical or social rules that one might expect in real life. At the same time, video games are imperfect entities, crawling with occasional bugs that may lead to unintentional consequences. Somehow, most players seem to be able to distinguish between an event that occurs as the result of an intentional design, and an event that occurs as the result of a bug. This process may be imperfect, and can lead to misunderstandings or misinterpretations, but by looking at these misinterpretations, we might uncover some of the underlying assumptions that players hold as they try to give an orderly account of the events that occur in the game

The findings of this paper come from an ethnography study of Asian adolescent video game players in New York City. One of the goals of the study was to discover how new players learn how to play, with the intention that, during these early moments, we might discover some of the players' underlying assumptions of their gameplay experience. This approach identifies these learning moments as they occur, not as a post hoc, reconstructed event, but as a situated event that unfolds in time. The study is also driven by the need to fill a gap in video game studies. As Squire notes, "[t]oo often, past analyses have focused on representation in the games or on the games or on the games' surface features, without examining gaming practices or experiences, or the games' meanings for their players" [18]. The present study attempts to attain a better understanding of video games by describing them in the situated language and actions of players during gameplay.

METHODOLOGY

Garfinkel's [5] argues that order and meaning are intimately connected aspects of social action. By order, Garfinkel refers to the constitutive rules used by the actors to render their activity into an event that can be mutually understood by other competent actors. When actors have different competencies, they might encounter misunderstanding between differing interpretations of the event. In his studies, Garfinkel often conducted "breaching experiments," where he would disrupt a commonly followed procedure of doing something (e.g. casual conversation) or to "making strange" a conventional way of looking at a situation (e.g. a classroom lecture) [3, 4]. Similarly, Gumperz [11] cites the value of studying "trouble" during communication, which Suchman [19] uses as a way of seeing not simply the mistakes that people make in interpreting an event, but the ways that they achieve intelligence and coherence, even if the coherence is erroneous.

This study presents one such example, where a novice player's interpretation of a game conflicts with the other, more expert players' interpretation. There are four participants in the following example: Jason, Andrew, Kevin, and Li. The first three were the focal participants of the study. However, as Li was a novice player to the game they were playing, her participation in their game yielded interesting insights on underlying assumptions that both expert and novice players possessed. In particular, it reveals that the expert players had their own definition of proper play that they needed the novice to understand, and the

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initial failure to communicate with the novice showed that the experts' interpretation differed from that of the novice.

The game they are playing is *Super Smash Brothers Melee* (SSBM), a GameCube fighting game from Nintendo. SSBM lets players pick from a variety of characters from popular Nintendo franchises to fight in different arenas. Each of the characters has unique abilities, usually related to the abilities from their original franchise. The game can accommodate up to four characters. Each game is timed, with the default being two minutes. To win, you have to maximize the number of times you defeat another character, and minimize the number of times your character gets killed. Players can have an unlimited number of lives, which means that they can die and return any number of times within the set time limit of the game. The excerpts presented here come from a session that lasted almost four hours. During this time, the experts tried to teach Li how to play, but failed to do so properly the first time. Li abandons their game, but returns later when they take find room in their play and make the effort to understand how she is experiencing the game. As a novice, Li seems to have trouble with two aspects of the game: the visual representation of "health" that shows how weak your character is, and the game's controller.

The study uses participant observation methodology. Each session was captured with an audio- and video-recorder, and the onscreen interactions were taped with a videocassette recorder (VCR). In addition, the researcher also took field notes of each session. Their conversations were then transcribed using the conventions of conversation analysis, which can be found in Sacks, Schegloff, and Jefferson [17].

FINDINGS

Seeing the order

Since SSBM is a fighting game, action tends to happen quickly, and can be confusing to newcomers. Li had to struggle not only to understand the controls but also to navigate the changing sceneries. The game moves so fast that, a few times, she had to ask which character she was controlling. She also seems to have trouble keeping her character from falling over edges or holes on the fighting stage, which instantly kills the character.

The damage indicator was a major source of confusion for the novice. It appears at the bottom of the screen in the form of percentages. The game manual writes: "When your attack succeeds, your enemy's damage percentage, displayed at the bottom of the screen, increases" [15]. However, it does not explain why the character can still survive if the character's percentage exceeds 100%. In fact, a character can still survive even if it has gone over 300%, suggesting that the percentage is not really a percentage of health that has been damaged or lost, or the likelihood that your character will die. Whatever it is an indicator of, it does not seem to be something that can be easily explicated fully and logically, even though players are expected to interpret it to mean that the higher the percentage, the more likely it is that your character will get killed when it is attacked.

About five minutes after the game began, Li inquires about the meaning of the percentages at the bottom of the screen:

Excerpt 1

1 L 下面 的 分數 是甚麼 意思 啊?

Below possessive score is what meaning final particle
"What's the meaning of the score below?"

2 A 是 你-

is you-
"You-"

3 J =是你 是你 打了打了多少

=is you is you hit hit how much
="Is shows how much you've been hit."

4 A 是 啊

Yes final particle
"Right."

5 L 啊 十四？ 是被人 打了 多少

Ah fourteen? Is by someone beaten how much
"Fourteen? It shows how much someone's beat me?"

6 嗎？

question marker

7 K =對

=Correct
="Correct."

This excerpt occurs during gameplay, which means that it was difficult to conduct "face-to-face" conversation because everyone is facing the screen. Thus, the normally available paralinguistic features of conversation are unavailable to aid in communicating meaning. All four players here participate in the question of the damage indicator, with Li initiating the question in line 1, Andrew and Jason (lines 2-4) assisting in the response, Li (line 5) reaffirming her understanding of their response, and Kevin (line 7) confirming her affirmation.

Her interpretation of the damage indicator becomes clearer later on, when she says:

Excerpt 2

1 L 喲 從 一百 三十幾 變成 零

Yo from a hundred thirty something turned zero
"What's the meaning of the score below?"
"Argh, my score went from 130 to 0."

(0.4s)

2 A 多 不是好 你 知道 嗎？

Many not good you know question marker
"It's not good to have a higher number."

There are a few observations worth noting. The first observation is that, although Li's interpretation of the percentages was not congruent with the other players', it was still a meaningful (i.e. non-random) interpretation that was rooted in her empirical experience. In other words, there was an underlying order to her meaning-making that

led her to believe that "more is good" or that having a higher percentage is a positive thing in the game. This can be likened to Lakoff and Johnson's [13] conception of "metaphor" and the way it structures our experience through language. They note that the way we use language to describe our experience is rooted in our physical, embodied experience. For example, we might use orientational metaphors to associate meanings such as "more is up" or "good is up" because our bodily experience of feeling happy and healthy tends to be expressed through being able to smile and stand upright, while our experience of feeling sad or weak tends to be expressed through frowning, having hunched shoulders, or being bedridden. In human-computer interactions (HCI), our experience remains an embodied interaction that includes not only the physical embodiment but also "a broader range of phenomena that may not be physical but are nonetheless occurrent in the world" [2]. Thus, even though the "main action" occurs on a virtual platform, we continue to use our embodied experience of the "real world" – through our visual field, bodily movements, and so on – to make sense of actions that occur in the virtual space. In Excerpt 1, line 1, Li's reference to the percentages as 分數 (fen shu) - or score - suggests that she expects the numbers to act as scores in exams or sports games, where a higher number tends to indicate a better outcome. In fact, most video games that do have scores follow a similar format, where the higher the score the better.

The second observation is that Li seems to have truly believed that she did something right to deserve what she thought was a high score, despite the fact that she got those numbers because she had been attacked by the other players. Thus, her preconceived interpretation has led her to a particular reading of the game that is both rooted in, but also diverges from, her empirical experience. This adheres to Garfinkel's [4] notion of the documentary method of interpretation, which describes people's perception of underlying patterns to organize our daily experience and make it meaningful. He writes that the "method consists of treating an actual appearance as 'the document of,' as 'pointing to,' as 'standing on behalf of' a presupposed underlying pattern." However, if the underlying pattern varies from what is in fact happening, then misunderstandings can potentially occur. In HCI, these can lead to communication breakdowns, as has been demonstrated in Suchman's [19] work. In this present case, we see that Li had managed to make sense of her gameplay experience despite having been attacked and dying constantly. Her sense of the game was rooted in selecting evidence that helped organize her experience, and ignoring others that do not fit it.

While Li's interpretation is inconsistent with the official view of the game developers and the other players, it does not make less sense from an empirical standpoint. The game does not really explain what the percentages refer to, so from a logical standpoint, the game developers' design does not make any more sense than Li's interpretation. In other words, if a group of players who all follow Li's interpretation were to play together, they would have had no trouble playing or enjoying the game in their own way. It can only be said that the "accurate view" implicitly represents the shared understanding of a community of SSBM players whose views are legitimate not because they are more reasonable or logical, but because they have decided that there are right and wrong ways of interpreting a particular game.

Finally, it is also worth noting that the other players took the effort to point out that Li's interpretation was mistaken. Had they not bothered to explain it to her, she might have continued to interpret the game in her way and still managed to play. Her mistaken reading did not make her a worse player and their corrected reading did not make her a better player. It was a particular orientation to the game that the other players found the need to point out. In ethnomethodology, Garfinkel [4] refers to this as the "accountability" of everyday practices, or the "observable-and-reportable, i.e. available to members as situated practices of looking-and-telling." This is simply to say that, in order to become a competent member of a particular group, one has to be able to perform actions that are recognizable to the other members as rational action. Dourish [2] points out further that "the accountability of action is not simply the property of being recognizably rational as it emerges in context, but also that it is organized so as to allow this." Just as conversational remarks are organized by sequential structure, turn-taking rules, and so on, complex social action that involve humans and non-humans are also organized and made accountable in localized practices. Thus, we see that, throughout their interaction, the other players – being more competent members of the group – not only pay attention to how Li is doing, but try to explain to her the accurate way of interpreting the game. They do not question whether their interpretation is any more logical than hers, as it does not matter in that particular context. The percentages are not percentages any more; instead, they represent how weak a character is and when it might be an opportune time to strike them. Li's mistake was to interpret the percentages in their more literal form, which makes more sense than its intended game meaning. The fact that the players are seen to point out Li's mistake suggests that it is not the game that cares about whether a particular rule is interpreted or understood in the right way, but the players who are involved in the action.

Teaching the order

Using and understanding a video game controller can be a daunting task. The Nintendo GameCube controller, for example, is designed to be held with both hands, and consists of eight buttons: a directional pad (or D-pad), and two analog sticks. Different games make use of this same set of controls and buttons in different ways, although certain buttons (e.g. the larger "A" button and its proximity to the right thumb) might be associated with more commonly performed actions, such as attacks. The SSBM manual devotes four double-facing pages to explain how the controller works within the game. This illustrates how complex it is to master the controls of a game such as SSBM. As Gee [9] points out, it is not uncommon for

players to skip reading the manual and jump straight into the game because they are able to teach the rules more effectively through active engagement. The participants in this study are no exception to this, except that it is never clear whether the players fully learned how to use the controls as instructed in the manual, or whether they merely find ways to pass as a competent player. The players in this study often do not know which exact buttons they pressed to make their characters perform a certain action. Since players have to focus their visual field on the screen, they cannot simultaneously see what their characters did while also seeing what combination of buttons they pressed. On a few occasions, they even tried to hold the controller in front of the screen, but even so, they were unable to identify the buttons that led to particular moves onscreen.

In addition, controllers are a challenging topic for conversation, particularly during the midst of gameplay. Instructions such as "Press that button" use what linguists refer to as "indexical markers," which are expressions that have context-specific meanings that allow speakers to communicate and understand one another without having to fully elaborate on the entire context of the situation [6, 12, 19]. The instruction "Press that button" alone is almost meaningless unless one knows what "that button" refers to, and what the specific situation is. As Suchman [19] notes, the "indexicality of instructions means that an instruction's significance with respect to action does not inhere in the instruction, but must be found by the instruction follower with reference to the situation of its use." Specifically with the Nintendo GameCube controller, there are three types of directional buttons (the analog stick on the top left corner, the yellow, analog C-stick, and the D-pad on the bottom left corner. Together, this means that the instructor has to know how to reference the action and controller in a way that is meaningful for the novice to understand and replicate.

Instructional episodes are usually structured by the time flow of the game. In SSBM, these episodes often happen during the transition times that occur after one game has ended and before the next begins. During this time, players have the chance to change their characters, the setting, or the rules of the game. At times, they give players a chance to take a break from the game, much like half-time in sports games. In SSBM, the transition between the end of the last game and the beginning of the next game moves past three screens. The game requires that each player press the "Start" button to indicate that they are ready to move forward. Since instruction during the game is difficult, Andrew and Jason usually use this brief time to instruct Li on the game, while Kevin is usually more eager to get the next game started. Thus, instead of using this timeframe to provide detailed instructions, the players can only give brief advice.

Giving instructions to Li has also been complicated by the fact that Li speaks Mandarin, while the other three are more fluent in Cantonese. Andrew seems to be most fluent in Mandarin, followed by Jason, while Kevin is least fluent and seldom communicates with her. Li herself does not speak Cantonese, so in order to give instructions, they have to switch dialects.

Up to this point, Li has not received many explicit instructions from her fellow players. While she asks a lot of questions, these questions tend to go unanswered, which begins to frustrate her:

Excerpt 3

1 L 你們 又 不 教 我

you also don't teach me
"You never teach me!"

2 K =( )

3 A =教了 你 啊

=taught you exclamation
="I taught you already."

(0.3s)

4 L 那就 每次 一直 按 啊

Then every time keep press exclamation
"You always just tell me to keep pressing."

5 A 你 要 跳 嘛::::::::::::

you have to jump final particle
"You have to jump under

6 [跳 到 人家 下面

jump to others below
others to escape being hit."

7 J [你 按 Li 這個 打 這個

you press Li press this one attacks this one
"Press this one to attack."

8 按 推 人 出去 還 要 按 下

press push people out also have to press down
"This one, press this to push people away. Press down to –"

9 按 下

press down
"Press down."

((game begins))

10 [你 可以電 人

you can electrocute people
"Electrocute people."

11 L [把人推下去 嗎?

push people down question marker
"Does it push people down the edge."

Li complains that they have not taught her how to play (line 1). Andrew defends himself by saying that he did teach her. (line 3). Her further complaint (line 4) points out that they have simply told her to press buttons, and Andrew tries to give her some tactical suggestions this time (line 5). Jason joins in (lines 7-9) to give her a few more detailed instructions, and tries to show it to her on the controller. As before, the other players do not wait before the instruction is over before moving the game forward. The game begins

even before the instruction has finished. The instructions themselves do not help Li because she requires a more basic explanation of what the buttons do and how the game behaves. Li is eventually frustrated by their inadequate instruction that she abandons the game altogether.

Learning the order

Effective instruction occurs when both expert and novice are able to mutually construct an interaction that enables them to communicate their views to one another. The next few examples show how, in order to adequately instruct Li, the experts had to suspend the gameplay and give Li the time to understand how the controls work. These moments problematize the notion of "situated" learning as articulated by game researchers because they suggest that instruction and play often cannot coexist. That is not to say that learning and playing can never occur simultaneously; rather, it is that learning and playing does not *always* occur simultaneously, and that sometimes it is more productive to separate the two actions.

In order to teach Li, the experts had to alter their regular gameplay by suspending certain rules, such as not attacking her while she is testing out new moves. This creates a kind of safe haven that allows her to learn in the environment in which regular play occurs, but without all the complex interactions happening at that same time. They also try to gradually break down their instructions into smaller, more manageable steps. Earlier, when they had simply been telling her which button-combinations to press, they had not given her sufficient information to allow Li to properly use these instructions. Although Li never articulates that she needs smaller incremental steps to understand the instructions, Jason was able to break down the steps through their evolving interaction and thus making the instructional episode a more collaborative effort.

This next excerpt occurs right after Li decides to return to the game. Jason asks her to sit with him and, as Kevin tries to pick up his controller, Jason and Andrew stops him from doing so, arguing that they always end up picking on her character instead of teaching her how to play:

Excerpt 4

1 L 去 教 我 玩 啦:::::

go teach me play exclamation
"Come and teach me how to play!"

2 J 你 坐這

you sit here
"Sit here."

(1.0s)

3 A [教 佢 玩 (0.9s) 你 話 邊嗰教 佢 玩?

teach her play (0.9s) you say who teach her play?
"Teach her how to play (0.9s) Who should teach her how to play?"

4 J [( )你 唔可以 玩住

( ) you cannot play yet
"( ) You can't play yet."

(1.0s)

5 A [畀 人 玩 囉 你 唔 畀 我 教]

let people play final particle you don't let me teach
"Let me play. You won't let me teach"

6 J [(你哋) 係咁 殺 Li..教 佢 了 嗎

(you) keep killing Li teach her already final particle
"(You all) keep attacking Li. Time to teach her."

7 A =係 囉

=right final particle
="That's right."

In this excerpt, we see that, instead of trying to teach Li while the others are also playing, Jason breaks out of this format by taking control over how the instruction unfolds. Jason starts by first requesting that Li sit next to him (line 2). This entails not only an alteration of the rules, but a reorientation of their physical environment and bodies. There is a brief struggle about how the teaching should unfold. Andrew asks who should be teaching (line 3), and as Kevin tries to move the game along, Jason asserts that he cannot play yet (line 4) because all they do is attack her instead of teaching her (line 6). Andrew and Jason both agree (lines 6-7) that they should teach her, and this agreement suggests that the instruction should be more explicit and directed than earlier attempts, and that perhaps they had not been properly or efficiently teaching her by throwing her into the actual game with a bare bone set of instructions. The deliberate move to stop others from playing and taking the time to teach her suggests that, in their view, instruction time has to be constructed outside of *regular play*.

In Excerpt 5, Jason tries to teach Li three moves, which is marked in the transcript:

Excerpt 5

1 J 你 按下 然後 按B ((first move))

you press down then press B
"You press down, then press B."

2 L (然後呢？)

(then final particle?)
("Then what?")

3 J 下 B

down B
"Press down, then B"

4 K (試招 啦)

(try moves final particle)
("Try some moves")

((Li performs a move))

5 J (看到嗎？)

(saw question marker)
("Did you see it?")

6 L =嗯

=uh huh

7 J =然後:::啊按A 再按 ((second move))

=then ah press A then press
="Then press A, then press."
(2.5s)
8 L 是他在幹 嘛?
is he doing what final particle
"What is the character doing?"
9 J 跳 啊
jump final particle
"Jump."
10 A ( )
11 J 跳啊
jump final particle
"Jump."
(1.2s)
12 J 我教 你 一 招 啊
((third move))
I teach you one move final particle
"I'll teach you [another] move."
13 L 然後 呢？
then question marker
"Then what?"
14 J 這樣子 跳起來 按這個
like this jump up press this
"Like this. Jump up, and then press this button."
15 L 等 一下！ 慢 一點
wait a moment slow a little
"Wait a moment! Slow down a little."

Much like how double-clicking on a mouse requires the user to click twice within a specific timeframe, video game controllers are also sensitive to how quickly buttons are pressed. Since video games often have many combinations that have to be performed on a restricted set of buttons, different moves are usually distinguished by slight variations (e.g. Press down and B, Press left and B, Press right and B, and so on). This complicates instruction because the player's visual gaze is required to focus on the controller and the screen simultaneously. As the activity is confined to the physical controller, Jason has to constrain both the physical and virtual movement of Li (the player) and Pikachu (Li's character). When Li confirms that she has understood (line 6), he moves on to the next instruction (line 7). Note that Li appears to expect further instruction after Jason tells her the moves. In lines 2, 8 and 13, Li asks for additional information about the move she was just taught. These questions are related to understanding the timing of the buttons to press. As she presses one button, she asks "Then what?", and Jason repeats the second part of the move. Thus, between the two of them, they have broken down the instruction into smaller, simpler steps. First, they control the game by ensuring that no one attacks her while she is being taught. Second, Jason allows Li to take control of the character while he gives her the instructions. Third, as Li executes the first part of the button combination, she asks further instruction, which Jason then provides. Note that this break down of steps into smaller, more manageable components emerged organically in their interaction. By paying closer attention on the instruction, Li and the other experts have managed to fine-tune their instructions to respond to the needs that Li has.

Video games, in and of themselves, often do not create the best scaffolds for learning. Much of the instruction that occurs requires that the players suspend the game to create a space and time that allows the novice to explore the game on her own terms. We might consider the instructions that occur on Excerpts 4 and 5 to be a more successful form of "situated learning." These examples shows that "situated learning" still requires that the novices and experts understand what kind of instruction is needed, and when it should be given. In other words, situated learning can take place in many forms, and is not always successful in teaching what needs to be conveyed. It may be that novices would learn about what it means to be a participant in a particular community of players without fully understanding the mechanics or rationalizations behind the game.

DISCUSSION

The term "situated" has been applied to a range of actions: situated learning [14], situated actions [19], situated language [7], situated activity [10], situated identities [1], just to name a few, all of which highlight the importance of capturing how an action unfolds in time, in particular places, and with particular people. In this paper, I have argued that video games "make sense" by the way players are able to construct meaning and interpret it as an orderly event. At times, different players may construct different orders within the same game, as was the case with Li and the expert players in Excerpts 1 and 2. In those examples, we saw that the experts' and the game developers' interpretation of the percentage did not make a whole lot of sense from the way we might conventionally think of percentages in its everyday usage. Yet, the experts were not bothered by it and even felt the need to ensure that Li had the same interpretation. On the other hand, Li's interpretation was still meaningful to her even though she was supplying it with meaning that did not really exist within the game.

Video game researchers like to argue that games are good because they engaged players in "situated learning," [7, 9] a term borrowed from Lave and Wenger's [14] notion of communities of practice and legitimate peripheral participation. However, these excerpts show that situated learning means a lot more than simply "learning by doing" or "contextualized learning." Even though Li's learning was situated, she has still failed to learn how to play the game,. It is not because Li is not cut out to be a player, or even that the experts were poor instructors. After all, Li did learn. She knew that they were bullying her and taking advantage of her novice status. She knew that they were not properly teaching her how to play, even though they were giving her instructions. She knew that this particular community of players requires that she knows certain moves that she does not have. In other words, although Li did not learn the mechanics of the game, she was learning the norms and rules of play within this community of players. She understood that she was continually kept in the peripheral,

and finally decides to break from the group and refusing to participate further. Her departure disrupts the participatory structure of the other players, who are no longer able to sustain their joint fighting game among the remaining three players.

The paper also described an episode of instruction between a group of players who had to try different ways of teaching a novice how to read and navigate the game. While the instructions themselves might seem quite simple (e.g. press this button, then that button), the construction of the instructional moment was complex and required constant (re)organization. The play had to be suspended, and a new space had to be crafted to allow the new player the opportunity to learn the new moves. The players did not arrive at this organization automatically; it was conducted through frustration and ignorance. Their ultimate organization may or may not be the most ideal way to instruct a novice how to play this particular game, but it was what they arrived at through trial and error, through the physical constraints on what was available on hand, and through paying attention to what information was needed for the novice to take the next step.

As Excerpt 4 showed, the method of instruction had to be a collaboration between expert and novice. Through Li's questions, Jason was able to find the types of instruction she needed and break them down into smaller steps. It is somewhat paradoxical that the learning was situated within the game, but outside of play. Some elements of the game had to be in place (e.g. a dummy opponent had to exist for the novice to confront). Li had to learn how to play by not playing. We might say that what she was learning was theory, which she needs to apply to practice. Jason provided her with the basic knowledge of how to "read" the game. Like learning a language, or what Gee [7, 8] calls a "Big-D Discourse", this means knowing not just what events mean, but also what to do at different times; in this case, what fighting games are like, what the different aspects of the setting mean, and what strategies to use under which circumstances.

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