

1 - We will add this chapter heading

The Frustration of Learning Monopoly: The Emotional Tension of Entering a New Game Encounter

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We piloted a new mechanism to measure physiological arousal (frustration, anxiety, excitement, etc.) in an observational setting. As a proof of concept, mothers' arousal was measured while they played a new board game. Some points of tension (times when a parent felt the players were becoming disengaged with the game) corresponded with an increase in arousal. From this work, we were able to suggest future design changes that would allow Hasbro to make a more calming experience and create less tension with their board game instructions. This paper shows the usefulness of measuring physiological arousal when attempting to understand emotional responses to a company's product or service.

Question

Hasbro, an American company that sells toys and games, approached the MIT Media Lab looking to understand how mothers learn to play board games. The company believed the difficulty of instructions kept parents from learning new games, which in turn reduced market growth. This question fit within Goffman's theory described in *Fun and Games* (1961): in game encounters there is a tension between being too engaged and too disengaged. With Goffman's description of game encounters, we looked at answering: how do arousing events correspond with tension when learning to play a new game?

We also created a novel way of measuring emotional experiences with new technology, prompting a second research question. Can measuring physiological arousal add an additional perspective in observational studies?

Previous Research Measuring Emotion:

The social sciences are beginning to consider emotional experiences, not only as a dependent variable, but as an intervening variable as well. As the field of emotional research grows, the demand for validity and accuracy of methodological tools that measure emotion will continue to increase (Thoits, 1989).

Katz, in his study of emotions in social contexts, measured people in naturally occurring events and analyzed personal idiosyncrasies (2001). His observational studies are

established from careful video analysis with subsequent interviews. Katz concedes that in these observational studies, the invisible side of emotions cannot be fully viewed, limiting the lens that an observer can understand a person's internal emotional response.

One way of measuring this invisible side of emotions is by recording changes in people's physiology (see Fahrenberg & Myrtek, 2001). For example, to understand arousal (frustration, excitement, anxiety, etc.), researchers can measure changes in the openness of people's sweat glands, known as their skin conductance (Duffy, 1972). Because measuring skin conductance historically required the use of a computer, research about people's arousal has traditionally been in non-natural, controlled settings. For example, Palkovitz and Wiesenfeld played loud tones to children with Autism sitting in a lab (1980). The researchers noticed that children with Autism, on average had a higher increase of skin conductance when responding to the loud tones. Psychologists like Palkovitz and Wiesenfeld measured the invisible side of emotions, but in a non-natural setting.

For this study we combined these two methods: we measured physiological arousal, but, instead of measuring individuals in a lab setting, we measured their emotional response in a more natural, real world setting. We observed arousal with a new, portable, low-impact device called iCalm, (Fletcher, 2010). In previous work with iCalm, Hedman measured the arousal of children with sensory challenges within therapy (2010). Hedman's work only included statistical analysis of skin conductance measurements. For this study, we include, in addition to physiological measurements, detailed analysis of video, unstructured interviews, and grounded theory analysis.

As a proof of concept, this project looks at the arousal of mothers while learning to play a new board game. We use the theoretical grounding of a game encounter as suggested by Goffman in his work *Fun and Games* (1961). Goffman shows how encounters create frames where the importance of some objects change within this frame. A participant needs to be spontaneously involved in this frame or tension may substantiate. Tension can occur in two ways: an individual may be drawn to matters outside of the game or repelled by the game itself. During the observed game play, certain events increased the level of tension; these events are referred to as incidents. For this paper we highlight three incidents that correspond with an increase in arousal.

Methods:

An observational study was conducted with four families living within the greater Boston area. Families differed in terms of number of children, sex of children, family structure, and parental education. All families had at least one child who was between the ages of 7 and 12. Recruitment was open to testing mothers and fathers, but only mothers volunteered for the study.

Family members were asked to wear a wristband that measured their skin conductance and were then videotaped. Participants were educated about the technology and its measurements prior to the experiment and were encouraged to take off the sensor if they felt uncomfortable having their emotions measured. Children were shown a bag of 6 to 10 different Hasbro board games. We instructed children to select a board game that their mother did not know how to play.

During the session, field notes were taken. Afterwards, we observed each family member's skin conductance, noting times when the slope changed. Family members were then interviewed about their emotional experiences through an unstructured interview. Participants were also interviewed about times when the slope of their physiological arousal changed. This multiple method approach allowed us to observe the emotional experience from a variety of perspectives.

Results:

Presented below are two mothers' skin conductance responses during a game session. The first family lived in the suburbs of the greater Boston area. The mother, Susan, had 3 children – a 12-year-old daughter, Macy; a 10-year-old son, Billy; and a 6-year-old daughter, Violet. As I arrived, the house was in the middle of spring-cleaning – boxes were scattered through the house. The mother had made freshly baked brownies for after the board game session. The family played in a dimly lit living room with a large rug. All four members sat on the floor to play. The eldest daughter, Macy, wanted to play Risk, but, with the mother's encouragement, the children chose Aggravation, a game that looked easier to play according to the mother. Below Susan's arousal is displayed for the first 18 minutes of play.



FIGURE 1 Susan's arousal while teaching Aggravation
 The red line represents an increase or decrease in the mother's arousal as indicated by her skin conductance. As Susan's skin conductance increases, she becomes more aroused.

Incident 1: Children Becoming Bored Reading Directions

All four mothers reported anxiety when attempting to read through the directions before their children became too bored. Susan read the directions for a total of nine minutes. During the first part, the three children sat and listened quietly, with their heads drooped down. At the blue star, where Susan's arousal begins to increase, Billy asks for clarification about the game rules in regard to the special star center. After answering the question, Macy then tells her mother "Go!" Further on, while reading the directions Macy again interrupts her mother.

Example 1

- 1 Susan: Whenever your marble lands in the center by exact count you can use it as a super shortcut.
- 2 Macy: I Know
- 3 Susan: Macy, I've got to read the directions.

Macy then begins moving her fingers around the board, and the other two children begin rocking back and forth. For all of these events, after Billy's question, Susan's physiological arousal increases.

In interviews afterwards, Billy described listening to the directions as boring, "It's like going to school." Susan explained that she felt rushed. She didn't want Macy and Billy to start fighting or Violet to start kicking around. Susan explains, "They have no patience. When they start playing a game or videogame or something."

The children becoming bored with directions is, as Goffman defines, emotional flooding. An emotional state, in this case boredom, becomes overwhelming and Macy acts out. This in turn causes Susan to have to attend to this incident, further creating tension. As the tension grows, we can see a corresponding increase in arousal.

Incident 2: Integrating A Novice Player and a Spoilsport

After reading the directions, Susan's family takes turns rolling the die and moving their pieces. Susan's arousal increases for the first three rounds of game play. During this time Susan corrects the direction Billy moves his pieces. She helps Violet count her moves and encourages her, "That's a girl Violet". Susan tells Mary that she has the option of taking out a new marble. She references instructions about "aggravating marbles" and contends with Macy where her marble is supposed to start.

Susan explains afterwards that she is worried that Violet will find the game too complicated, and in turn ruin the game for the rest of the family. She also described her frustration of Macy being a spoilsport, and trying to intentionally ruin the game.

Many of the described actions can be seen as means of regulating play. Susan makes sure that the rules are being followed and that the players know the edict of the game. While no game ending incidents appeared, for Susan, the fact that they could occur created tension. Goffman calls this "making" a situation in which members of an encounter actively integrate incidents into the frame. For Susan, this active attempt of integrating Violet's skill level and Macy's rebellious behavior was arousing.

The second family consists of Jacob and his mother Mary. Jacob lives with his mother and grandmother in a small apartment in a run down section of Boston. Amongst the discarded mattresses and broken cars, I consistently heard sirens walking to Jacob's house. Jacob and his mother were waiting for me at the steps. Jacob's mother had to bribe him to enter the house with us, as Jacob was running around the apartment with his friend. Jacob and his mother played their game on the living room floor. A couch and small TV filled the room. On the corner was a desk with multiple pictures of Jacob playing soccer and corresponding trophies. Jacob chose to play Connect 4 a game that he had played at the Boys and Girls Club but his mother did not know the rules. Below is Mary's skin conductance during the first 12 minutes.

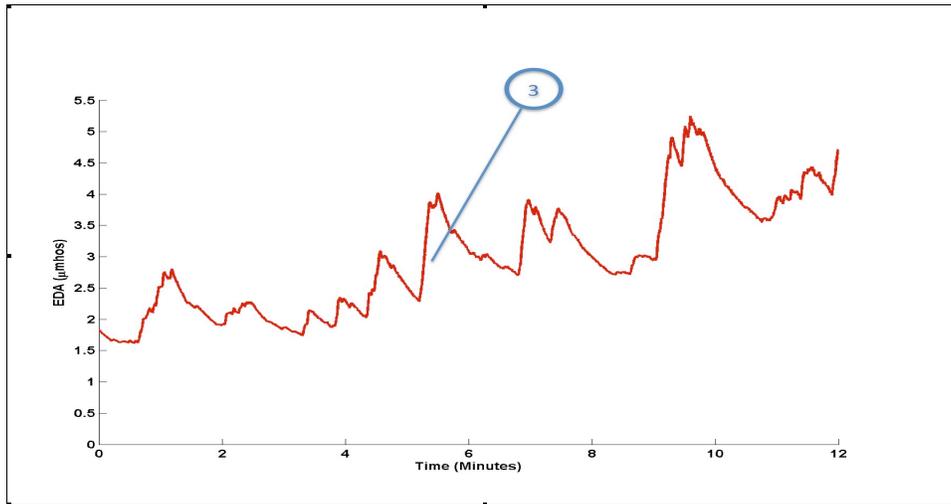


FIGURE 2 Mary's arousal while teaching Connect 4
 The red line represents an increase or decrease in the mother's arousal as indicated by her skin conductance. As Mary's skin conductance increases, she becomes more aroused.

Incident 3: Winning a Game and Cheating

We observed a large peak in arousal at Point 3 in Figure 2. At this point Mary believed she won at Connect 4:

Example 2

The mother puts a piece in the game slot

- 1 Mary: Connect 4!
- 2 Jacob: It's not Connect 4.
- 3 *Jacob begins laughing..*

- 4 Mary: One, Two, Three, Four. Four together. No. Jacob, No, No, You're
Unfair. Jacob you are unfair. No, No, No, No. No Jacob you are unfair.
Because just now you had something coming across so
- 5 *At the end of this discourse, Mary dumps the pieces of the game across the floor.*

In the interview, Mary explained that winning was important to her – she wants to show Jacob that she is smarter than him. In addition she explained how she felt that Jacob was cheating throughout the whole time and she didn't trust him. She only spent 16 seconds in total reading the directions, so she did not have clear directions on what constitutes a win. Goffman describes the role of cheaters in the frame of play,

“We can thus understand one of the social reasons why cheaters are resented; by locating the power of determining the outcome of the play in the arrangements made by one player, cheating, like mis-matching, destroys the reality-generating power of the game” (p.67).

In this scenario, two different tensions appear to occur for Mary. First, Mary is emotionally engaged in winning and showing that she won. This emotional state seems to take over the edict of play, hence emotional flooding. In addition, Mary feels that Jacob is cheating and this further increases tension, as he is not participating in the frame of play. This observed tension once again corresponds with an increase of arousal.

Conclusion:

Three varying incidents were highlighted that caused tensions for the mother. All three of these incidents corresponded with an increase in physiological arousal, suggesting that tension can be emotionally arousing. Neither part of this relationship is exclusive. A person can become aroused for other reasons; for example, when Susan was fully engaged with the game (no tension), we also saw peaks of arousal corresponding with the parent's excitement capturing a piece or winning the game. Additionally, arousal can be both negative and positive, whether tension is perceived as good or bad cannot be concluded from physiological arousal alone. Finally, there are many incidents during a game, and we only highlighted a few.

Through the introduction of these three incidents, I showed how skin conductance provides an additional lens for understanding the internal emotional state of participants. While Goffman's theory of encounters provides theory about when tension occurs, skin conductance showed people's emotional response to this tension. This helped Hasbro identify points of emotional stress in a valid and quick way (only 4 sessions). Our next step will be to help Hasbro design new games that create less tension and stress for the mother. For example, to address Incident 1, we propose Hasbro makes mechanisms to allow children to participate in the reading of directions. Perhaps quizzes could be put throughout the reading period.

Measuring physiological arousal does add challenges to the observational study. The wristbands appeared to be non-intrusive, but the participants were aware that their emotions were being recorded, which likely altered their behavior and internal reflection.

Some parents expressed a feeling of emotional-nakedness while wearing these sensors, stating phrases such as, “I bet you can see that I’m nervous now.” Future research should look at how observers can best show empathy and understanding for participant’s pre-cognitive responses. In previous work (Hedman, 2010), we spent many sessions over multiple days with the children wearing sensors, which allowed the children to acclimate to both the camera and the wristbands. Even with these challenges, compared to traditional studies like Palkovitz and Wiesenfeld’s, having participants wear a simple wrist band allows for a much more natural experience instead of wearing wires and electrodes connected to a computer.

While comparing the benefits of measuring physiological arousal to traditional observational methods deserves a paper all in itself, preliminary conclusions can be made about this new methodology. Arousal can be measured in other ways, such as self-report or observing people’s minute behavior. For example, in Incident 3, the mother’s voice was raised; she threw the game board on the ground; and, afterwards, she told us that winning was important to her. However, multiple measurements of arousal can only add to the validity in interpreting emotions. Skin conductance also provides a more precise instrument for measuring the time when emotion changes. For example, in Figure 1, Susan’s arousal almost instantaneously begins increasing after Billy asks for clarification and we can see that after three rounds her arousal begins to decrease. An observer would have to look extremely close to see these subtle changes begin to occur, and having participants recall these exact moments has been difficult without the aid of our physiological graphs.

More than ever, industry focuses on improving the experience of their products and services (Pine, 1999). A major component of this experience is the emotional experience. This study provides a small example where measuring the emotional response can help inspire future product design. Additionally, this research exemplifies the usefulness of skin conductance within observational studies to help researchers better understand the invisible side of emotions.

FIGURES

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