Motivation to Play Video Games:

Effects of Extrinsic Rewards and Reward Signaling on Intrinsic Motivation

Ivana Lee

University of California, San Diego

ivlee@ucsd.edu

Abstract

Video games are a globally prevalent form of entertainment with player demographics that span multiple age, gender, and ethnicity groups; it is a rapidly growing industry with a pervasive international reach. This study examines the motivations behind video game play through self-determination theory, which outlines how an individual's experience during an activity is variable when they behave for intrinsically versus extrinsically motivated reasons. Based on previous motivation studies, we predicted that individuals playing a video game would report decreased intrinsic motivation when offered extrinsic rewards, while the presence of audio signals would increase intrinsic motivation. Participants ($N = 82$) were recruited from psychology classes at the University of California, San Diego and through researchers' personal contacts. Participants played a video game and completed a 22-question self-report Intrinsic Motivation Inventory, rated on a 9-point Likert scale. Results indicated that intrinsic motivation levels were lowered by extrinsic monetary rewards. There was no significant effect from audio signals and no significant interaction between extrinsic rewards and audio signals. Our study suggests that intrinsic motivation studies can be applied to the context of video games and be used to analyze real-world situation such as e-sports or to understand the psychological implications of different game elements.

Motivation to Play Video Games: Effects of Extrinsic Rewards and Reward Signaling on Intrinsic Motivation

Video gaming is one of the most rapidly growing entertainment industries and encompasses an expansive and diverse population of consumers. The global video game market is projected to surpass 90 billion dollars by 2020 and 49% of the U.S. population has played video games at least once in their lives (Statistica, 2017). The pervasive nature of gaming highlights a need for research on the psychology behind video games and people's motivations to play. Previous studies have focused on the negative aspects of video game use, in terms of gaming addiction (King et al., 2017) or the effect of violent video games on adolescent aggression (Anderson & Bushman, 2001; Gentile et al., 2004). However, a motivational perspective can be applied in order to understand the underlying structure of video games, how this influences user engagement, and the reasons why people play.

Based on Self Determination Theory (SDT), I propose that participants offered extrinsic rewards for their performance in a video game, will report lower levels of intrinsic motivation than participants who are not offered extrinsic rewards. Additionally, I expect that exposure to in-game audio signals will act as a form of performance-based positive feedback and increase intrinsic motivation for participants across both levels of extrinsic reward (Deci & Ryan, 1999).

Self Determination Theory

Self Determination Theory (SDT) is an approach to human motivation that outlines two basic forms of motivation, formed by three innate psychological needs. The most basic motivation types are intrinsic motivation and extrinsic motivation; these motivation types are differentiated based on the reasons that give rise to an action. Specifically, intrinsic motivation refers to doing something because it is inherently enjoyable or interesting, while extrinsic motivation refers to doing something for its instrumental value because it leads to a separable outcome (Ryan & Deci, 2000a). Research on SDT has shown that an individual's experience and performance on an activity is variable when they behave for intrinsically motivated versus extrinsically motivated reasons (Deci, 1971).

SDT also identifies competence, autonomy, and relatedness as three innate psychological needs that influence variability in intrinsic and extrinsic motivation types. When these needs are satisfied, self-motivation and mental health are enhanced, but when thwarted lead to diminished motivation and well-being (Ryan & Deci, 2000b).

Effects of Extrinsically Motivating Rewards on Intrinsic Motivation

Multiple research studies have examined the effect of extrinsically motivated rewards on an individual's intrinsic motivation (Ryan & Deci, 2000a). The general consensus is that self-reported intrinsic motivation was significantly undermined by the presence of tangible extrinsic rewards. A meta-analysis of 128 studies found that all forms of rewards, including performance-contingent rewards, tangible rewards, and expected rewards, significantly undermined intrinsic motivation (Deci et al., 1999).

A classic study by Deci (1971) investigated the effects of external motivators, in the form of monetary reward, on intrinsic motivation to perform an activity. In two lab experiments and one field experiment, results showed that when money was used as an external reward, intrinsic motivation tended to decrease. This indicates that monetary rewards may act as a stimulus which leads subjects to cognitively reevaluate the activity from being intrinsically motivated to one that is primarily motivated by external financial rewards.

In a study on reward-contingent and intrinsic motivation, Ryan, Mims, and Korester (1983) found that performance-contingent rewards, given for a specified level of performance, are experienced as a controlling aspect that pressures people toward specified outcomes. If the reward associated activity must be done in some particular way, time, or place, then the reward tends to be experienced by the participant as controlling and decreases the individual's perceived autonomy, which relatedly decreases intrinsic motivation. In this way, externally motivating rewards are perceived as controlling and align with self determination theory's position that a lack of perceived autonomy decreases an individual's reported intrinsic motivation

Effects of Audio Reward Signaling on Intrinsic Motivation

Intrinsic motivation research has found that perceived autonomy is enhanced by positive verbal feedback (Deci et al., 1999). When verbal reinforcement and positive feedback are present, intrinsic motivation tended to increase (Deci, 1971). Audio reward signals can be equated to the positive verbal feedback utilized in these studies, and would therefore increase intrinsic motivation through a similar process of positive reinforcement. This effect of audio reward signaling on intrinsic motivation can be furthered by research on game design.

Studies on the structural characteristics of video games identify the category of presentation features, which encompasses the visual and auditory presentation of a game (King et al., 2009). Focusing on the sound features, players form positively reinforced associations between the auditory game stimuli that signal key game elements, such as point scoring, and the accompanying pleasurable feelings of achievement.

Interactions

Participants in both extrinsic reward levels (financial reward and no reward) are expected to report higher levels of intrinsic motivation when exposed to audio signals than when there is no sound. The magnitude of this audio signal effect on intrinsic motivation will vary depending on the specific extrinsic reward condition; participants who do not receive financial rewards will have greater intrinsic motivation than those who receive rewards.

Although no studies directly address this specific interaction, an experiment by Deci (1971) examined similar intrinsic motivation influencers. They conducted two laboratory experiments to investigate the effects of extrinsic financial rewards and positive verbal feedback on intrinsic motivation while performing a task. The first experiment involved 3 sessions in which participants were asked to reproduce 3-dimensional geometric figures using wooden blocks in various shapes. In the first session, experimental and control groups were asked to reproduce three figures within a 13-minute time limit. During the second session, experimental participants

were paid $1 for each figure reproduced with the time limit while control participants solved the same figures without pay. In the third session, both groups solved the same figures without pay. The only difference between control and experimental groups was in session two, when experimental subjects were paid for their performance – during this session, experimental participants were performing both for external rewards and intrinsic motives.

Between each session, participants were given an 8-minute free period during which they could choose to do what they wished. Experimenters observed participants through a one-way window and recorded whether they worked on the figure task. The length of time participants chose to spend freely working on the figures during this free period was the primary measure of intrinsic motivation. After comparing times from the first and second free periods, results show that participants who were paid for their performance displayed less interest in figure reproduction during the free period than participants who were not paid.

The second experiment followed the exact same format but the rewards used were verbal instead of monetary. In the second session, experimental participants received verbal reinforcement (e.g. "That's very good") and positive feedback (e.g. "That's much better than average for this configuration") instead of being offered money for their performance. The results of this second experiment showed that participants given verbal reinforcement and feedback displayed more interest in figure reproduction during the free period than participants who were not given any verbal cues.

Results from both the first and second experiment suggest that when external monetary rewards are used, subjects lose intrinsic motivation for the activity. However, the use of verbal reinforcement and positive feedback seems to increase subject's intrinsic motivation. Adapted to video game contexts, these verbal cues can be generalized as simple audio cues that signal positive feedback for performance. The results of this study provide a basis for our expectation of an interaction between extrinsic reward and audio signals.

Summary of Hypotheses

Hypothesis 1: Main effect of extrinsic rewards. We hypothesized that receiving extrinsic financial rewards leads to lower intrinsic motivation, compared to no extrinsic rewards. Specifically, we predicted that participants who play a video game with extrinsically motivating financial rewards will report lower intrinsic motivation through an Intrinsic Motivation Inventory (IMI) scored on a 9-point Likert scale, than participants who play without extrinsic rewards.

Hypothesis 2: Main effect of reward signaling. We hypothesized that exposure to audio signals leads to greater intrinsic motivation, when compared to no audio signals. Specifically, we predicted that participants exposed to positive feedback audio signals, which play whenever a point is scored during the game, will report higher intrinsic motivation through an Intrinsic Motivation Inventory (IMI) scored on a 9-point Likert scale, than participants who play the game without audio signals.

Hypothesis 3: Interaction between extrinsic rewards and reward signaling. We hypothesized that the effect of extrinsic reward levels on participant intrinsic motivation would

vary depending on the presence of audio signals. Among participants exposed to positive feedback audio signals, those who also receive extrinsic financial rewards will report slightly more intrinsic motivation after playing the game, compared to participants who do not receive rewards. Among participants not exposed to audio signals, those with extrinsic rewards would register higher intrinsic motivation than participants without extrinsic rewards.

Method

Participants

A total of 82 people participated in our study; 53 females, 28 males, and 1 who preferred not to say. Participant ages ranged from 15 to 27 years ($M = 21.28$, $SD = 2.02$). The ethnic composition of our sample was mainly Asian (65.9%), followed by Hispanic (18.3%), White (13.4%) and Other (2.4%). Most participants had an education level of some college or a college degree (89%) and the remaining had a high school equivalent or less (11%). These participants were recruited from two psychology classes at the University of California, San Diego, and through the researchers' circle of family, friends, and coworkers. The psychology students were asked by their instructor to participate as part of a class activity while the remaining subjects were approached in-person by individual experimenters. The study was conducted in-person through a laptop with an experimenter present during the entire activity.

Research Design

Our experiment utilized a 2x2 between subject factorial design. Two independent variables were used to test the effect of extrinsic rewards and reward signaling on individuals' intrinsic motivation while playing a video game. The first independent variable, extrinsic reward, had two levels: reward and no reward. We operationalized the extrinsic reward level by telling participants they would receive a gift card after playing the video game, with the monetary value of the gift card reflecting the amount of their final game score (10 cents for every point scored). Participants in the no extrinsic reward level were not offered a gift card for their participation.

The second independent variable, reward signaling, had two levels: sound on, and sound off. This was operationalized through an audio signal which sounded whenever participants scored a point within the game. During the sound-on levels, audio cues associated with reward signaling were played aloud through the laptop's speakers, at approximately 30% of the maximum volume. The laptop's volume was muted during the sound-off levels. A total of 4 conditions were used: extrinsic-sound on, extrinsic-sound off, no extrinsic-sound on, and no extrinsic-sound off.

Participants first played an apple drop video game on a laptop computer, using only the trackpad to control linear movements. The game objective was move a basket on the screen, by sliding left and right on the trackpad, in order to catch apples falling from the top of the display. Participants played the game in a quiet location, under the supervision of a researcher and without any other participants present.

After playing the game, their final scores were recorded and they were asked to complete a 3-part online Google Form containing basic demographic information and questions designed to measure intrinsic motivation during and after the game. Part one was completed by the researcher and recorded the participant's identification number, final game score, and the name of the researcher supervising the game. Part two collected the participant's demographic information, including gender, age, ethnicity, and education. Part three comprised a 22-question Intrinsic Motivation Inventory (IMI).

Measures

The dependent variable of our study was intrinsic motivation, as quantified by the length of time participants would voluntarily play the game and their levels of interest and enjoyment. Length of time for voluntary play was measured by a single question. Participants were asked "If you could continue to play the game right now for fun, how much longer would you play it for? (in minutes)". This question asked participants to enter the length of time in minutes, for which they would freely choose to play continuing playing the game. The minimum acceptable answer was zero minutes and there was no maximum cut-off value. This self-report measure was intended to assess participants' intrinsic motivation levels after playing the game.

Participants' interest and enjoyment levels were measured through a 22-question Intrinsic Motivation Inventory (IMI), designed to assess participant's subjective experience and intrinsic motivation during game play (McAuley et al., 1987). These questions were adapted from pre-existing validated scales used in past experiments related to intrinsic motivation (Ryan, 1982; Ryan, Connell, & Plant, 1990; Deci et al., 1994). The inventory yielded four sub-score dimensions: interest/enjoyment, perceived choice, perceived competence, and pressure/tension. The interest/enjoyment subscale provided a self-report measure of intrinsic motivation. Perceived choice and perceived competence subscales were both positive predictors of self-report and behavioral measures of intrinsic motivation. Comparatively, the pressure/tension subscale represented as a negative predictor of intrinsic motivation.

Participants rated each of the IMI statements using a nine-point Likert scale (1 = not at all, 9 = very true). Examples of the statements include: "I found this game very interesting" (interest/enjoyment subscale), "I think I am pretty good at this game" (perceived competence subscale), "I felt that it was my choice to play the game" (perceived choice subscale), and "I did not feel at all nervous while playing the game" (pressure/tension subscale).

Results

Description of Pattern of Means

We hypothesized that the presence of extrinsic monetary rewards and audio reward signals would effect participants' intrinsic motivation while playing a video game. This was measured by the amount of time (in minutes) participants wanted to voluntarily play the game for after completing the initial task, and by using the IMI interest-enjoyment subscale. Examining the pattern of means, there appeared to be an effect of extrinsic rewards on intrinsic motivation. Consistent with our hypothesis, participants who were offered a reward reported less interest in

continuing to play the game after completing the required task (M = 5.17, SD = 5.42), compared to participants who were not offered a reward (M = 9.27, SD = 11.25). Additionally, levels of interest and enjoyment on the IMI subscale appeared to be lower for participants offered rewards (M = 4.47, SD = 1.62) than for those who were not offered rewards (M = 5.25, SD = 1.63).

Looking at the pattern of means for reward signaling, audio signals did not appear to have an effect on intrinsic motivation, in contrast to our initial hypothesis. Participant's reported levels of interest in continuing to play the game were approximately equivalent between those who played the game with audio reward signals present (M = 7.15, SD = 7.16) and those who played without sound (M = 7.29, SD = 10.64). Participants in the audio signaling condition indicated only slightly higher levels of interest and enjoyment (M = 5.04, SD = 1.87) compared to those in the no audio condition (M = 4.69, SD = 1.42).

The pattern of means suggests no interaction; the effects of extrinsic reward on intrinsic motivation did not vary across levels of audio reward signaling. The effect of extrinsic reward (difference between extrinsic reward and no reward) among participants exposed to audio signals (M = 5.00, SD = 4.86 vs. M = 9.19, SD = 8.44; gap = - 4.19) was not significantly different than the effect of extrinsic reward among participants not exposed to audio signals (M = 5.33, SD = 6.02 vs. M = 9.35, SD = 13.84; gap = - 4.02). Specifically, the presence of an extrinsic reward was associated with 4.19 points lower intrinsic motivation among those in the audio reward condition, and was similarly 4.02 points lower among the no audio condition. The pattern of means is not sufficient enough to determine the null hypothesis and there is a need to conduct statistical significance testing on the effects.

Description of ANOVA Results

There was a significant main effect of extrinsic reward on participants' intrinsic motivation to play the video game, $F(1, 78) = 4.32$, $p = .04$. Participants in the extrinsic reward condition reported lower levels of intrinsic motivation than those in the no-reward condition. This supports our hypothesis and existing literature demonstrating that monetary rewards decrease an individual's intrinsic motivation to perform a task. However, inconsistent with our hypothesis regarding audio reward signaling, there was a no significant main effect of audio signals, $F(1, 78) = .02$, $p = .90$. In this case, participants in the sound-on and sound-off conditions did not differ significantly in reported intrinsic motivation levels during game play. There was no significant interaction between extrinsic reward and audio reward signaling, $F(2, 78) = .00$, $p = .97$; the effects of extrinsic monetary rewards did not vary across audio signaling levels.

Description of t-test Results

Using an independent sample t-test, we examined whether participants' reported intrinsic interest (the length of time, in minutes, participant's wanted to continue playing the game for) differed between extrinsic reward and audio reward signaling levels. We found no statistically significant difference in mean intrinsic motivation between the extrinsic-reward-sound-on and no-reward-sound-off groups, $t(23.61) = 1.33$, $p = .20$. Looking at the effect size, the difference between the groups was small to medium, $d = .42$.

Similarly, we examined whether participants interest and enjoyment level, a subcomponent of intrinsic motivation, differed between extrinsic reward and reward signaling groups. We again found no statistically significant difference in mean intrinsic motivation between the extrinsic-reward-sound-on and no-reward-sound-off groups, $t(38) = .77$, $p = .45$, and the effect size was small $d = .24$.

Discussion

Summary of Key Findings

Existing literature has consistently shown that extrinsic motivators, financial rewards in particular, decrease individuals' intrinsic motivation during performance-contingent tasks. In contrast, auditory cues in the form of verbal reinforcement and positive feedback tend to increase individuals' intrinsic motivation. Literature on structural game elements suggests that video game sounds have similar positive reinforcement effects to verbal reinforcement and feedback. This influences player behavior through positive association of the sound effect's audio cues with increased game scores. In following with this past research, we hypothesized that participants' intrinsic motivation levels would be lower when they received extrinsic monetary rewards but higher when exposed to audio signals.

Our results showed statistical significance for the effect of extrinsic rewards on motivation levels. Reported intrinsic motivation levels were lower for players who received monetary rewards than for those were were not offered rewards. This supports our hypothesis that financial rewards decrease intrinsic motivation on a performance-contingent activity. An alternate explanation for this finding could be that participants did not actually believe the experimenters when they offered financial rewards in return for game performance. This would be due to participants being gathered from a pool of psychology students knowledgeable of typical experiment methods. Participants who were offered rewards, but distrusted the experimenter's motives or failed to believe in the reward, may show a paralleled decrease in intrinsic motivation levels.

In contradiction to our hypothesis on sound effects, the results did not show significant correlation between audio signals and motivation. Intrinsic motivation levels were similar between players exposed to audio signals during the game and those who played without sound. This deviation from our initial expectations may be due to the frequency and repetitive nature of the audio signals. The fast-paced game caused the sound effects to play almost constantly. There was little time between individual audio signals and this highly repetitive frequency may have been interpreted as an annoying sound, or distracting, rather than pleasing. This would negate the original positive feedback intent behind the audio signals and decrease player interest and enjoyment during game play.

Limitations and Strengths

Our study was limited by several factors related to participant demographics and specific game elements. The average age of participants was 21, and most were female. Since the study deals with video games, a more equal distribution of gender would better reflect real-world gamer

populations. Generally, males in the U.S. engage in more video game play than females. Gender roles may result in females being less exposed to different types of games and therefore have less experience or interest than males. Although we tried to design our game in a way that would be intuitive to all participants, having more female participants with less experience or interest in video games would affect baseline intrinsic motivation levels. Additionally, the simple visual appearance of our game may have been less appealing to participants who expect modern video games to be graphically complex, narrative-driven, and visually appealing. This would affect interest and enjoyment during game play if participants were not satisfied with the appearance of the game.

The specific sound effect used as the audio signal was taken from a generic bell-sound in the game-development program's sound library. We intended for the sound to be a universally recognizable signal, but this may have resulted in a procedural confound. Our intended manipulation of audio signals and no-audio signals may instead be perceived as unpleasant sound and no sound. The unpleasant, or even anxiety-inducing, interpretation of the audio signal may be due to the sound's rapid frequency of occurrence during the game. The signal sounded each time players scored a point and was intended to be a positive association with the increased game score, but could instead be heard as annoying or a distraction. A better way to operationalize audio signals would be to choose a more positively-associated sound effect, ideally validated through use in past research. Another potential improvement would be to use verbal signals (pre-recorded in a pleasant narration voice) instead of non-verbal sound effects.

Despite the limitations, our study also had strength in it's external validity and expansion upon past research. Individuals from diverse demographic groups and backgrounds engage in video game and this allows our study to maintain a high degree of external validity. Our game was not linguistically complex and could be adapted for use in different languages. The visual elements are consistent with most video game formats and are therefore generalizable to other participant populations and settings. Another strength within our study deals with the absence of non-violent video game research within psychology literature. Our approach to motivation research expands upon this existing research. By examining player motivation within video games, we addressed a prevalent activity applicable to a broad range of individuals.

Concluding Comments

Most of the established research on intrinsic motivation was conducted in the late 1970s and 1980s, and deals with task-based problem solving and puzzle activities (Ryan & Deci, 2000a). Our study brings these concepts into the modern realm of video game markets. Video game play is a commonplace activity, encompassing a diverse demographic group on an international scale. The expanding game market now includes new areas such as e-sports, in which players compete for prize money in large sport arenas (Statistica, 2017). This introduces monetary incentives into a traditionally intrinsic-based activity and highlights a need for modernized approaches to established motivation research. Our study's examination of extrinsic financial rewards and intrinsic motivation within video games can be applied to real-world situations such as e-sports and implies that our findings are significant on a broader scale. Although our audio signal results were not statistically significant, additional research into similar sound effects may be conducive to understanding player motivations and engagement. Past studies have outlined general game

elements, including sound effects and background music (King et al., 2009), but more in-depth analysis would help game designers and players understand the effects of auditory cues. Further research in this field would allow us to understand the psychological implications of different game elements and how this effect the many individuals who play video games.

References

Anderson, C. A., & Bushman, B. J. (2001). Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: A meta-analytic review. *Psychological Science, 12,* 353-359.

Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology, 18,* 105-115.

Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. (1994). Facilitating internalization: The self determination theory perspective. *Journal of Personality, 62,* 119-142.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125,* 626-668.

Gentile, D. A., Lynch, P. J., Linder, J. R., & Walsha, D. A. (2004). The effects of violent video game habits on adolescent hostility, aggressive behaviors, and school performance. *Journal of Adolescence, 27,* 5-22.

King, D. L., Delfabbro, P. H., & Griffiths, M. D. (2010). Recent innovations in video game addiction research and theory. *Global Media Journal, 4,* 1-13.

King, D. L., Delfabbro, P. H., & Griffiths, M. D. (2009). Video game structural characteristics: A new psychological taxonomy. *International Journal of Mental Health and Addiction, 8,* 90-106

McAuley, E., Duncan, T., & Tammen, V. V. (1987). Psychometric properties of the intrinsic motivation inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport, 60,* 48-58

Miranda, A. T., & Palmer, E. M. (2013). Intrinsic motivation and attentional capture from gamelike features in a visual search task. *Behavior Research Methods, 46,* 159-172.

Plant, R. W., & Ryan, R. M. (1985). Intrinsic motivation and the effects of self-consciousness, selfawareness, and ego-involvement: An investigation of internally-controlling styles. *Journal of Personality, 53*, 435-449.

Przybylski, A. K., Rigby, C. S., & Ryan, R. M. (2010). A motivational model of video game engagement. *Review of General Psychology, 14*, 154-166.

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology, 43,* 450-461.

Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*, 54–67.

Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55,* 68-78.

Ryan, R. M, Mims, V., & Koester, R. (1983). Relation of reward contingency and interpersonal context to intrinsic motivation: A review and test using cognitive evaluation theory. *Journal of Personality and Social Psychology, 45,* 736-750.

Schultz, W. (2001). Reward signaling by dopamine neurons. *Neuroscientist, 7,* 293-302.

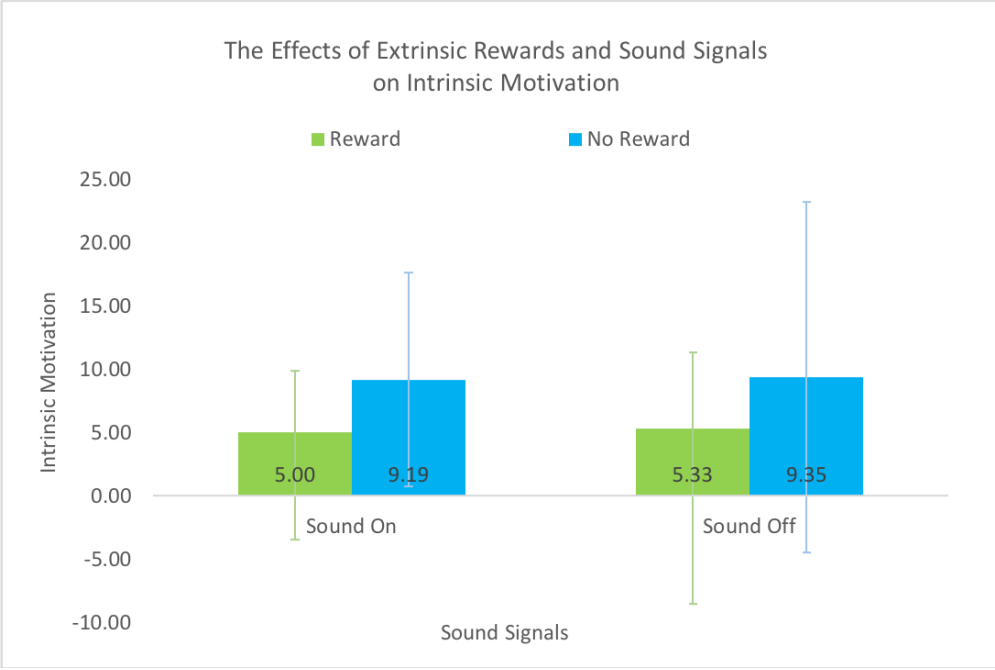
Statistica Inc. (2017). *Gaming in the united states.* Retrieved from https://www.statista.com/topics/1680/gaming/

SuperData Research (2017). *Market brief: 2017 digital games & interactive media year in review.* New York: Super Data Research.

Table 1: *The effect of extrinsic reward and sound signals on intrinsic motivation*

	Sound on	Sound off
	M (*SD*)	*M* (*SD*)
Monetary Reward	5.00 (4.86)	5.33 (6.02)
No Reward	9.19 (8.44)	9.35 (13.84)

Figure 1: The effect of extrinsic rewards and sound signals on intrinsic motivation



Appendix A

Intrinsic Motivation Inventory (IMI)

For each of the following statements, please indicate how true it is for you, using the following scale. 1 = not at all, 5 = somewhat true, 9 = very true

1----------2----------3----------4----------5----------6----------7----------8----------9
not at all somewhat true very true

1. While I was playing this game, I was thinking about how much I enjoyed it _____
2. I did not feel at all nervous while playing the game _____
3. I felt that it was my choice to play the game _____
4. I think I am pretty good at this game _____
5. I found this game very interesting _____
6. I felt tense while playing the game _____
7. I think I did pretty well at this game, compared to other players _____
8. Playing the game was fun _____
9. I felt relaxed while playing the game _____
10. I enjoyed playing the game very much _____
11. I didn't really have a choice about playing the game _____
12. I am satisfied with my performance on this game _____
13. I was anxious while playing the game _____
14. I thought the game was very boring _____
15. I felt like I was doing what I wanted to do while I was playing the game _____
16. I felt pretty skilled at this game _____
17. I thought the game was very interesting _____
18. I felt pressured while playing the game _____
19. I felt like I had to play the game _____
20. I would describe the game as very enjoyable _____
21. I played the game because I had no choice _____
22. After playing this game for a while, I felt pretty competent _____

Appendix B

Sample of video game participants played during the experiment