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COLOR AND COLOR PLACEMENT EFFECTS ON PURCHASE INTENT OF LOOT
BOXES IN VIDEO GAMES

By

MACKENZIE BLAND

A thesis submitted in partial fulfillment of the requirements
For the Honors in the Major Program in Marketing
in the College of Business Administration
and in the Burnett Honors College
at the University of Central Florida
Orlando, Florida

Spring Term 2020

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ABSTRACT

Research on the effects of color associations in gambling situations has especially come to the forefront in recent times with the rise of casinos and other sales techniques in which consumers do not know the outcome of their purchases. Loot boxes are a unique form of micro-transactions in video games where players are uncertain about the objects they will receive with their monetary purchase. The aim of this study is to explore the effects of color and color placement in ads on loot box purchase intent. It will contribute to research about color perception in marketing and will, more specifically, establish a link between color associations in Call-to-Action (CTA) buttons and online video game environments in which gambling takes place. This research sets out to demonstrate that the color red, when placed in a foreground CTA button will achieve the highest purchase intent for a theoretical loot box in an online video game scenario. The study tests the placement of the color (foreground and background) and the color itself (red, blue, and gray).

ACKNOWLEDGEMENTS

I would like to thank David Luna for being an amazing Chair and helping me overcome my self-doubts and gaps of knowledge.

Laura Boman, for supporting me and my research from day one.

Elizabeth Bland, for going through a process like this with me and always giving me feedback no matter how annoying I was.

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INTRODUCTION

Color associations have been studied throughout psychological research history. In the past century, research on the effects of color associations in gambling situations has especially come to the forefront with the rise of casinos and other sales techniques in which consumers do not know the outcome of their purchases. Loot boxes are a unique form of microtransactions in video games where players may purchase a collection of unknown objects. In this study, I aim to explore the effects of color and color placement in ads on loot box purchase intent to further research about color perception in marketing and, more specifically, to establish a link between color associations and online video game environments in which gambling takes place.

BACKGROUND & SIGNIFICANCE OF RESEARCH

With the rise of loot boxes as a common mechanism in online multiplayer video games, much research has been performed on the behavior of players who purchase these loot boxes. Studies show that loot box purchase behavior is akin to gambling behavior (Brooks & Clark, 2019; Li, Mills, & Nower, 2019; Macey & Hamari, 2019; Zendle, & Cairns, 2019), and these studies have contributed to regulations and common practices for loot boxes and other microtransactions in video games. There has been a lack of exploration in this field of loot boxes outside the association of gambling behavior.

While studies surrounding loot boxes and other video game mechanics are still in early stages of research, color associations have long been prevalent in marketing and psychology fields. There are many theories that attempt to explain why colors make us feel and do certain things, and particularly interesting are the associations with the color red. Red has been shown to induce arousal and stimulation (Fetterman, Robinson, & Meier, 2012; Kuzinas, 2013; Mentzel, Schücker, Hagemann, & Strauss, 2017), as well as dominance, aggression, and anger (Wiedemann, Burt, Hill, & Barton, 2015). This has led to many studies involving the effects of the color red and gambling. The color red in bidding platforms has been shown to increase willingness to pay (Bagchi & Cheema, 2013) and red lighting increases risky betting behavior in casinos and betting situations (Stark, Saunders, & Wookey, 1982; Ten Velden, Baas, Shalvi, Preenen, & De Dreu, 2012; Yazdi, et. al, 2019; Spenwyn, Barrett, & Griffiths, 2010).

This study aims to shed light on the association of the color red and gambling in the context of loot boxes in video games. Additionally, this study will further research on color placement in ads, specifically on the placement of color in the background of the ad versus the

foreground, which will be the “call-to-action button” (CTA), or the button a consumer clicks on within the ad to purchase the loot box.

This study will contribute to the marketing and psychology literature on color associations and color processing, along with risky behavior in online and video game contexts. This study will be the first to combine these specific variables and factors and will bring significant contributions to these fields in the outcomes and general discussion.

SUMMARY OF LITERATURE

Colors & Mental Associations

Color and associations in humans have been studied since the 19th century, pre-dating marketing research on packaging design, communication, and calls-to-action. These early studies focused on simple associations with nature and the environment (C., 1859; Chipman, 1885). By the 20th century, research on color associations picked up. Many of these studies on color and emotional associations had children pick emotion words to correspond with colors they were shown (Wexner, 1954; Lawler & Lawler, 1965; Cimbalo & Beck, 1978; Boyatzis & Varghese, 1994; Terwogt & Hoeksma, 1995). Later studies explored the theory that color associations are cultural and contextual, meaning that color associations are a function of the linguistic connotations within a culture (D'andrade & Egan, 1974; Ou, et al., 2004; Aslam, 2006;). For example, the color white is mostly associated with “purity” and “happiness” in Anglo-Saxon cultures but is associated with “death” and “mourning” in Asian cultures (Aslam, 2006). By the later half of the twentieth century, color associations started to appear in marketing research, with studies indicating that color is an important cue in marketing (Kotler, 1973; Garber et al., 2000; Kerfoot, Davies & Ward, 2003).

Red & Mental Associations

Studies have shown that red is recognized as a color that induces arousal and stimulation (Fetterman, Robinson, & Meier, 2012; Kuzinas, 2013; Mentzel, Schücker, Hagemann, & Strauss, 2017). The color red has been shown to also induce dominance, aggression, and anger (Wiedemann, Burt, Hill, & Barton, 2015). In a study performed by Mentzel, Schücker,

Hagemann, & Strauss (2017), it was found that when participants were shown “dominant” words such as *power*, *strength*, and *action*, there was a faster response to categorize the words as such by those who saw the words in a shade of red than those who saw the words in blue or gray. Similar research has shown free association between the color red and “fear” words such as blood, pain, and danger (Kuzinas, 2013). Such research has been powerful in establishing a link between the color red and emotional associations.

Foreground & Background Color Manipulations in Advertisements

While color may influence consumer behavior, it is important to also focus on the degree to which the consumer is conscious of the color. Studies have shown that the effects of color association on behavior are subconscious (Chiu, Lo, & Hsieh, 2017; Kuzinas, 2013; Mentzel, Schücker, Hagemann, & Strauss, 2017). The degree of subtlety of association can be manipulated in different situations such as placement within ads. One study has shown that when any color, including red, is used in the background of advertisements, as compared to the foreground (e.g. the CTA button—the button linked to the next step of the conversion process), the effect of the color is reduced to the point where any effects are not significant. (Jacques, Perry, & Kristensson, 2015). In an open letter to search engines regarding the placement and disclosure of advertisements, the Federal Trade Commission (FTC) acknowledged that when text advertisements are placed in a shaded background, consumers are less likely to detect these ads (Jacques, Perry, & Kristensson, 2015).

In a study by Sokolik, Magee, & Ivory (2014), “warm” and “cool” colors were explored through the use of red and blue in banner ads and box ads. The strongest effects were found in

the click-through rates of red box ads, while all other ads had negligible results. In this study, the researchers posit that consumers “have become habituated” to banner ads (Sokolik, et al., pg. 33). Due to their prominence on the page, the red box ads could have shown the highest click-through-rate, while the banner ads could have been easily ignored with their placement at the top of the page. Such research suggests strategic placement and coloring of ads on web pages to encourage conscious and non-conscious attention by the consumer.

Informal A/B testing (a very simple way to test different versions of a web page or elements within one) on marketing websites that demonstrate red and other warm-toned colors like orange CTA buttons are more likely to be clicked than their cool-tone counterparts such as blue and green (Gordon, 2010; Porter, 2011). In fact, many marketing websites state that it is a common practice to differentiate the CTA button color within an ad by using contrasting colors (Niggulis, O., 2019; Mount, 2019; Fernandez, 2020), but there has not been much formal research on this specific placement of color within ads. That is, studies have been performed to test consumer awareness and click behavior of ads where the entire advertisement is colored, but not much attention has been given to the actual mechanism by which consumers click the ad. Much of the research on color in products, packages, and advertisements does not get published because of competitive concerns (Bellizzi et al., 1983) so there might be formal research on the colors of call-to-action buttons, but it is simply not published.

Joshua Porter, a blog writer for popular digital marketing platform Hubspot, released an article in which he examined the results of his own informal A/B test with red and green call-to-action button colors. He found that the red button outperformed the green button by 21% in click-through rate (Porter, 2011). Andy Gordon, a writer for the technology blog dMix, revealed

that by changing the call-to-action color from green to red on dMix's website, there was conversion rate improvement of 34% (Gordon, 2010). However, it is important to note that both authors added that while the red color worked for their informal studies, it is the use of contrast that makes call-to-action buttons perform well (Gordon, 2010; Porter, 2011). Since there is very little formal research on the effects of color in call-to-action buttons, this study will examine these effects to contribute to digital marketing literature.

Color Associations in Gambling

Many studies have been performed to assess the association between the color red and gambling behavior (Bagchi & Cheema, 2013; Stark, Saunders, & Wookey, 1982; Ten Velden, Baas, Shalvi, Preenen, & De Dreu, 2012; Yazdi, et. al, 2019; Spenwyn, Barrett, & Griffiths, 2010). Being exposed to the color red increases willingness-to-pay in auctions, which is likely due to the signal of dominance and aggression to outperform the bidders (Bagchi & Cheema, 2013). Red also decreases willingness-to-pay in negotiations, likely because of the signal of dominance and aggression to get a better deal than the seller's offer (Bagchi & Cheema, 2013).

Other studies have shown that warm and red lighting in casinos tends to make people's gambling behaviors riskier and is shown to increase people's bets and the frequency of betting (Stark, Saunders, & Wookey, 1982; Ten Velden, Baas, Shalvi, Preenen, & De Dreu, 2012; Yazdi, et. al, 2019). Red lighting and fast-paced music together have been shown to have the most significant effects of betting more money and more often (Spenwyn, Barrett, & Griffiths, 2010).

No matter the theory on why such behavior occurs when people are exposed to the color red, the link between red and increased risky behavior in gambling is an important contribution to the field of color psychology. Many studies have shown that purchasing loot boxes in video games are a form of gambling behavior (Brooks & Clark, 2019; Li, Mills, & Nower, 2019; Macey & Hamari, 2019; Zendle, & Cairns, 2019), and as such, the theories that surround color in gambling situations should also apply to these loot boxes.

Microtransactions

Microtransactions are defined as any very small financial transaction conducted online (“Microtransaction, n.d.”). While this term is broad, this study will specifically focus on microtransactions occurring within video games. In some games, microtransactions that allow players to access an unknown set of items, called loot boxes, are an important mechanic. Loot boxes are virtual goods in video games that produce randomly generated in-game rewards (Brooks & Clark, 2019). These loot boxes offer players a set number of items with an either known or unknown chance of receiving certain objects. For example, some games will display the rarity of items and the chance of receiving those items, while others do not display this information at all.

The objects that can be purchased in loot boxes are typically cosmetic, meaning they do not affect gameplay and are just for the enjoyment of the player. Some items common to loot boxes include profile pictures, character outfits, poses and dances the player can enable, stickers, and dialogue. Despite the lack of influence on game play, rare items are extremely valuable and coveted. Items and certain collections of items can be auctioned and traded for thousands of

dollars. In June 2019, the game *Overwatch* hit the \$1 billion mark in in-game sales (Hargreaves, 2019).

Loot Boxes & Gambling

In many recent studies, the act of purchasing loot boxes has been shown to be a behavior akin to gambling (Brooks & Clark, 2019; Li, Mills, & Nower, 2019; Macey & Hamari, 2019; Zendle, & Cairns, 2019). Since the player does not know for certain what items he or she may receive, they are engaging in a form of gambling when they pay for an unknown outcome.

In a study at the Institute of Physiology, University of Fribourg, researchers found that uncertainty itself is a reward for the brain as dopamine is released in situations where the reward is uncertain, with increased dopamine released in the moments leading up to the potential reward (Fiorillo, Tobler, & Schultz, 2003). While there are many other theories related to gambling behavior, most conclude that gambling is reinforced by this release of dopamine (Fiorillo, Tobler, & Schultz, 2003; Fiorillo, 2011). While gambling behaviors in loot box purchases have not been tested for dopamine releases specifically, there is no *a priori* reason to dissociate the purchase of loot boxes, which is a form of gambling, to the theory of dopamine release.

Concerned ethicists, lawmakers, and video game authorities have depended on scientific studies to suggest regulations on loot boxes as a mechanic in games (King & Delfabbro, 2019; McCaffrey, 2019). Players themselves have voiced their dissenting opinions on games that rely solely on loot boxes and other microtransactions for gameplay advancement, such as EA's *Star Wars: Battlefront*. Loot boxes present a type of "predatory monetization" in which players "spend an escalating amount of money that begets further spending on the game" (King &

Delfabbro, 2018). In 2018, the Belgium Gambling Commission declared that loot boxes are in violation of gambling legislation (Gerken, 2018). Other countries have also followed suit and the UK and US are posed to make legislation about them soon (McCaffrey, 2019). Loot boxes also easily entrap children as they “may be particularly less equipped to critically appraise the value proposition of these schemes” (King & Delfabbro, 2018).

HYPOTHESIS

As it has been shown that the color red has a significant effect on gambling behavior, and that loot box microtransactions are a form of gambling, I predict that red will have a significant effect on loot box purchase intent. The exact reason why red will have this effect could be due to an increase in risky behavior from the display of the color red in general. This is a physiological theory of red and risky behavior. We have already identified literature that shows red induces arousal and stimulation (Fetterman, Robinson, & Meier, 2012; Kuzinas, 2013; Mentzel, Schücker, Hagemann, & Strauss, 2017). Using this theory, any ad with red in it should produce riskier behavior and lead to higher purchase intent due to the participants' physically elevated state.

A second theory of symbolism focuses on the emotional associations between red and words like "exciting" (Wexner, 1954) and "fear" words such as blood, pain, and danger (Kuzinas, 2013). The mechanic used to gamble for the contents of the loot box, the CTA button, should appeal to informal research which states that the button color itself should be in contrast with the background and stand out. This contrast causes the participants to be drawn to the button due to salience (Taylor & Fiske, 1978). After the participant's attention is on the button, they will process the color. If the button color is red, the participants' purchase intent will increase due to the color association promoting a desire for the objects in the loot box, or to take the gamble and get the dopamine rush associated with opening the box. Using this theory, participants will have a higher purchase intention for only ads with a red button, not a red background. This leads to the hypothesis,

When the call-to-action button is red (versus blue) there will be an increase in loot box purchase intent, while the difference between the colored backgrounds (red, blue, and gray) will be negligible.

METHODOLOGY

This study explores the connection between color associations and loot box purchase intent. The study examines this through a one x five factorial design between subjects, in which color (red, blue, and gray) and color placement (foreground and background) are tested for significant effects on purchase intention behavior of undergraduates at the University of Central Florida. Two hundred thirty-three students were compensated through extra credit in their classes given participation.

An online survey was designed in which the study participants were told they are playing a video game that they enjoy. When they advanced through the survey, a loot box advertisement appeared. Each participant received a randomized version of the ad. The versions were as follows: red background, blue background, red purchase button, blue purchase button, and a gray control (see Appendix B: Stimuli). The background and purchase button were not colored at the same time, meaning that the gray control color was in every version and only one color and one placement was displayed at a time. This was implemented to ensure that the effects of the color and placement could be isolated. The participant was asked questions about their willingness-to-purchase the loot box, including if they would buy it, how the ad made them feel, and how they feel about the loot box mechanic itself. To view the entire survey, please reference Appendix A: Survey.

The image of the ad itself was set to a default of gray (HSL: 0/0/50), which ensured neutrality against the colors since gray is the absence of hue. The red (HSL: 0/50/75) and blue (HSL: 100/50/75) will be set to a luminance of 75 to adjust for the relative luminance of the neutral gray. Blue and red tones with the same luminance of the gray do not stand out and make

the text unreadable. Since the areas of the ad that were colored must stand out from the gray, it was decided that the blue and red would be slightly brighter than the gray.

The loot box had a price of \$1.00 which was shown as in-game currency of 100 “gold.” Participants were told this conversion rate. The participants were also told that the game producers had given all accounts a 100 gold allowance as part of a special deal to increase future spending on items in the game. The ads also included the varying rarity levels of the objects they could receive, as well as the chances of receiving those items.

After being shown the loot box ad, participants were asked to answer a number of questions including their willingness to purchase the loot box, whether they felt the loot box shown was a good deal, and how much in-game gold they would be willing to spend on the loot box. These questions were followed by an adapted PANAS emotion scale to gauge participants’ emotions shortly after seeing the paywall, as well as several control questions about whether they have played video games and interacted with loot boxes before. Finally, participants were asked about prior gambling behavior and answered the DOSPERT scale of risk-taking behavior.

To analyze the results, I used the ANOVA method in R Studio to test for significant effects at the color, placement, and interaction of color and placement levels for individual questions. Additionally, I used R Studio to analyze the effects in a general linear model. My hope was to gain insight on what is affected by participants’ view of the loot box paywall besides purchase intent, and connect other ideas, theories, and behaviors to explain the phenomenon of color associations in online gambling environments.

RESULTS

In this preliminary study, I found significant results for how much in-game currency participants were willing to pay for the loot box they saw. It is important to note that this measure is not the original dependent variable where participants answered, “Would you unlock this loot box?”. Instead, this measure was the result of the question, “How much Gold (in-game currency) would you be willing to pay for this loot box?”

The significant results came from a regression model in R in which the amount people were willing to pay was fitted against the different stimuli conditions. Each ad level was dummy coded to perform regression. I found that the Red Button was the only loot box ad that predicted the amount of gold participants were willing to pay at a significant level ($\beta_{\text{RedButton}} = 23.561$, P-Val = 0.023, StdDev = 10.279, $t = 2.92$).

A comparison of means for the amount participants were willing to pay for the loot boxes was run in R as well. The ANOVA model was significant ($F = 2.885$, P-val = 0.024), showing that there is a significant difference between the means. Through a second multiple comparison of means with Tukey’s HSD, the means of the Control and Red Button ads were significantly different (CI: Red Button – Control = (4.15, 52.603), P-val = 0.0127). No other means were significantly different through the Tukey HSD analysis. Table 1 displays the results, while Figure 1 graphically displays the mean amounts participants were willing to pay.

In summary, this study produced results that showed the mean amount participants who saw the Red Button ad were willing to pay was significantly different from that of the Control and that the Red Button ad produced a higher estimated value of the loot box. Other measures such as the PANAS scale of emotions, the DOSPERT scale of risk-taking behavior did not

provide any significant insight to connect emotions or risk-taking behavior to purchase intent. Other questions that asked if respondents have played video games before, seen loot boxes in video games before, or spent money on games correlated highly with purchase intent, however these analyses proved insignificant.

Table 1 – One-way ANOVA for Amount Willing to Pay with Purchase Intent Counts

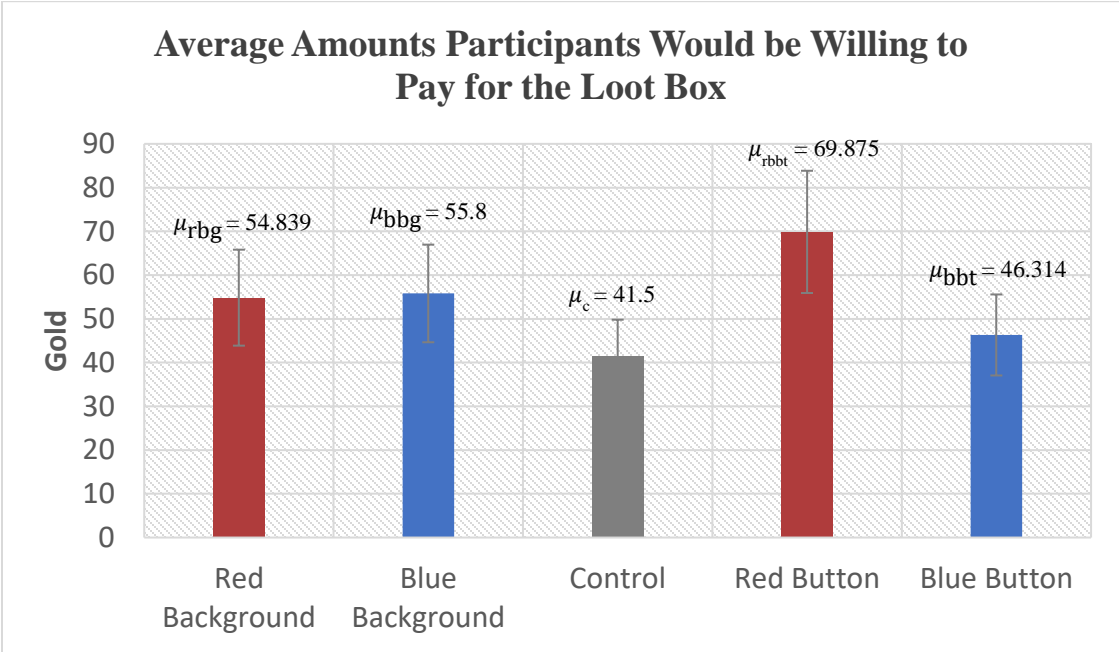
One-way ANOVA for Amount Willing to Pay
 $F = 2.885$, $P\text{-val} = 0.024$

Combination	Amount Willing to Pay	SE	Would Purchase	n
Red Background	54.839	4.926	17	31
Blue Background	55.8	4.948	16	30
Control	41.5*	4.994	32	61
Red Button	69.875*	7.75	20	32
Blue Button	46.314	4.787	13	35

*Significant difference between means at $\alpha = 0.05$

$CI \mu_{rb} - \mu_c = (4.15, 52.603)$ $P\text{-val} = 0.0127$

Figure 1 – Graph of Average Amounts Participants Would be Willing to Pay for the Loot Box



DISCUSSION

In today's modern world, our social interactions, monetary transactions, and sources of entertainment are all increasingly happening online. As we prepare for a world where microtransactions dominate our ability to interact with a digital world, marketers should be aware of cues, conscious or non-conscious, that trigger spending in online customers. Furthermore, lawmakers and activists should also be prepared to combat tactics that manipulate at-risk populations, such as children, into making purchases. This research is a start to recognizing and revealing some of the ways color and color placement effects our intention to buy in online video game environments.

The results of the study indicate that there was a difference between the mean amounts participants were willing to pay for the Control and Red Button ads and that the estimated amount increased when participants were shown the Red Button ad. These results are a good start to supporting the hypothesis raised. While the Red Button ad led to higher amounts participants were willing to pay for the loot box, the Red Background ad did not, which is in support of the symbolic, rather than physiological, theory. If the color red led to higher purchase intent because of the physical stimulation, there should have been similar results seen in the Red Background ad, not just the Red Button. Since only the Red Button ad showed a significant difference from the control, it is likely the respondents' attention was drawn to the button due to salience and then the effects of the color processing took place.

One stipulation is that the measure used in these results was the amount of gold participants were willing to pay for the loot box. The results of the question, "Would you purchase this loot box?" did not prove significant in a chi-squared analysis. These measures are

inherently different because the amounts participants were willing to pay was on a numeric slider from 0-200, while the other question had a yes/no binomial response. Getting significantly different observed results than expected for the binomial response would be extremely powerful for the purpose of this study, however with such small cell counts this measure proved insignificant.

Conclusions from this study indicate the Red Button ad did affect the amount participants were willing to pay for the loot box. The reasons for finding significant results in the amounts people were willing to pay but not for purchase intent itself could be many. This research was backed by literature on gambling and risk-taking combined with color, however most prior research does not specifically look at scenarios in online video gaming. Gambling research is effective because gambling, whether it is through betting, playing cards, or rolling dice, is the activity in which participants directly partake. In the scenario used in this study, the microtransaction of purchasing a loot box is a peripheral activity to the video game itself. Participants might have felt the loot box was too far removed from an actual video game situation because the gambling scenario was removed from the main activity. Additionally, the Red Button ad could have been valued more because it appears to be “correct” for what participants might imagine a loot box ad is supposed to look like. Another theory is that participants might need a baseline figure to reference in order for the Red Button to non-consciously evoke risk-taking behavior.

Limitations

This research is a preliminary dive into color effects in a digital environment. While it was found that the Red Button ad did significantly increase the average amount participants were willing to pay for the loot box and had a significantly higher average value than that of the control, these results are limited by several factors including COVID-19 shutdowns, short study timelines, and study scenarios.

As of March 16th, 2020, the University of Central Florida shut down in response to COVID-19, also known as the Coronavirus or SARS-COV-2. In-person classes were cancelled and moved online, and students were required to leave campus. After this date data was still collected, however this was not in a controlled lab, but rather delivered to students via email for them to complete at home. While the survey program, Qualtrics, did not change, the environment and social issues of the time may have impacted the results of the third study. The results listed and discussed may not be reliable due to this impact.

In addition to data collection possibly being skewed because of the COVID-19 shut down, this research only occurred for the duration of a single semester and had to be within an even smaller timeframe than that to analyze the results. Overall, there was an approximate window to gather data of two months. Such time limitations prohibited the further development and evolution of this study.

Another limitation is that while the scenario was for a video game environment, the study ended up being a scenario in which participants were asked to imagine they were playing a video game they liked and enjoyed. Results taken from just the pool of respondents who indicated they play video games on a regular basis did not provide large enough cell counts for proper analysis,

much less significant results. The pool for those who indicated they played video games with loot boxes in them and could list a number of those games off the tops of their heads in the survey was even smaller. Additionally, in an ideal scenario, participants would be asked to actually play a video game in which the loot box ads would be placed naturally. This would let the respondents be free to choose to actually purchase the loot box. Higher quality and more reliable data would be gathered in this way, however there are definitely limitations to what an undergraduate researcher can do.

Future Research

The results from this preliminary study are indeed promising. Additionally, the results from the other measures also were correlated to the different ads shown but simply did not have enough cell counts or respondents to draw a statistically significant conclusion. Even though these measures did not produce significant results, it is hopeful for future research. Future research should continue to evolve the study and try to get close to simulating an environment where participants can actually purchase (or make a simulated purchase of) a loot box. Additionally, there was no significant difference between the number of participants who indicated they had ever spent real money on any microtransaction in any type of video game or mobile game. Those that did indicate they had made a microtransaction in a game had wildly varying amounts spent, ranging from cents to hundreds and even thousands of dollars. Future research should repeat this study with only a pool of participants who have made microtransaction purchases before.

While red and blue were the primary colors chosen for this study, future research could be conducted to determine what other colors could have an impact on purchase intention. In many video games silver, gold, and purple, for example, are all visual indicators of value in many situations. Future research should investigate loot boxes and the colors of visual value systems to come up with more realistic stimuli.

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APPENDIX A: SURVEY

Scenario

Imagine you are playing an online multiplayer game that you like and enjoy. This game uses a mechanic called loot boxes, in which you can purchase unknown objects of differing rarity. The objects in these loot boxes are cosmetic, meaning they do not bear any impact on your ability to win or play the game. These objects are highly coveted, however, and many players will go to great lengths to unlock them.

The game uses an in-game currency called gold. 100 gold is equivalent to \$1.00 USD. As part of a special sale, the company who produces the game has given out 100 gold to all users' accounts for free. The game producers believe this will allow people to experience in-game purchases and increase the likelihood that users will spend their own money on in-game purchases in the future.

On the next page, you will see an ad for a loot box costing 100 gold.

Stimuli will be randomized and shown right after the scenario explanation. Please see Figures 1-5 for the stimuli.

Questions:

Would you purchase the loot box you just saw?

Yes (1)

No (2)

How likely would you be to unlock this loot box?

- Not Likely to Purchase at All 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - Extremely Likely to Purchase 7
-

How much did you like this ad?

- Strongly Disliked 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - Strongly Liked 7
-

Do you believe this offer was suitable for a loot box in a video game?

- Not at all Suitable 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - Extremely Suitable 7
-

Do you feel this loot box is worth 100 gold, which is equivalent to \$1.00 USD?

- Not Worth 100 Gold 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - Extremely Worth 100 Gold 7
-

Q66 Do you feel this loot box is a good deal?

- Not a Good Deal at All 1
- 2
- 3
- 4
- 5
- 6
- Extremely Good Deal 7

How much Gold (in-game currency) would you be willing to pay for this loot box?
You can move the slider with your mouse to the exact amount you would be willing to pay.

0 25 50 75 100 125 150 175 200



Adapted from the PANAS (Watson, D., Clark, L. A., & Tellegen, A., 1988)

To what extent do you feel...

	Very Slightly or Not at All 1 (1)	A Little 2 (2)	Moderately 3 (3)	Quite a Bit 4 (4)	Extremely 5 (5)
Interested (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distressed (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excited (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upset (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strong (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guilty (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scared (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hostile (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enthusiastic (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Proud (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irritable (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alert (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ashamed (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inspired (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Nervous (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determined (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attentive (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jittery (18)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Active (19)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Afraid (20)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

Recall the ad you saw moments ago. What color was the background?

What color was the purchase button?

Page Break

Have you played a video game in the past six months?

Yes (1)

No (2)

How frequently do you play video games?

Never / I do not play video games 1

2

3

4

5

6

Every day 7

Have you ever played an online multiplayer game that features loot boxes?

Yes (1)

No (2)

Maybe / Not sure (3)

If you have played a game like this, please enter the name or names of those games.

Have you ever purchased a loot box in a video game?

- Yes (1)
- No (2)
- Maybe / Not sure (3)

Have you ever spent real money on online transactions in video games?

- Yes (1)
- No (2)

Q58 Roughly how much money have you spent on online transactions in video games in the past six months? Please enter a number without the dollar sign. Estimate to the best of your ability.

Page Break

Please rate the degree to which you believe purchasing a loot box is a risky behavior.

	Strongly Disagree 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree 7 (7)
Purchasing a loot box is a risky behavior. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate the degree to which you believe purchasing a loot box is gambling.

	Strongly Disagree 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree 7 (7)
Purchasing a loot box is gambling. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Adapted from the DOSPERT (Blais, A.-R., & Weber, E. U., 2006)

Please rate the degree to which you agree with the following statements.

	Strongly Disagree 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree 7 (7)
Taking risks makes life more fun. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My friends would say that I'm a risk-taker. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy taking risks in most aspects of my life. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would take a risk even if it meant I might get hurt. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking risks is an important part of my life. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I commonly make risky decisions. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am a believer in taking chances. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I am
attracted,
rather than
scared, by
risk. (8)

Have you ever bet or gambled for money or possessions?

Yes (1)

No (2)

Page Break

Gender What is your gender?

Male (1)

Female (2)

Other/Prefer Not to Answer (3)



Age What is your age?

APPENDIX B: STIMULI

Figure 1 - Control



Loot Box Special!
Only 100 Gold – Limited Time Only!

Unlock Box Now!

Contents: In this box, you will receive five items consisting of avatar icons, character skins, and/or character poses.

Rarities & Odds: Common – 56% Rare – 30% Legendary – 11% Epic – 3%

Figure 2 – Red Background



Loot Box Special!
Only 100 Gold – Limited Time Only!

Unlock Box Now!

Contents: In this box, you will receive five items consisting of avatar icons, character skins, and/or character poses.

Rarities & Odds: Common – 56% Rare – 30% Legendary – 11% Epic – 3%

Figure 3 – Blue Background




Loot Box Special!
Only 100 Gold – Limited Time Only!

Unlock Box Now!

Contents: In this box, you will receive five items consisting of avatar icons, character skins, and/or character poses.

Rarities & Odds: Common – 56% Rare – 30% Legendary – 11% Epic – 3%

Figure 4 – Red Purchase Button



Loot Box Special!
Only 100 Gold – Limited Time Only!

Unlock Box Now!

Contents: In this box, you will receive five items consisting of avatar icons, character skins, and/or character poses.

Rarities & Odds: Common – 56% Rare – 30% Legendary – 11% Epic – 3%

Figure 5 – Blue Purchase Button



Loot Box Special!
Only 100 Gold – Limited Time Only!

Unlock Box Now!

Contents: In this box, you will receive five items consisting of avatar icons, character skins, and/or character poses.

Rarities & Odds: Common – 56% Rare – 30% Legendary – 11% Epic – 3%