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# The effect of age-rating labels containing loot boxes on parent's perception of video games

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## ABSTRACT

Loot boxes are a mechanic in video games that give players randomised rewards. In some cases, loot boxes can be purchased with real money, and offer rewards that have real financial value. There is concern that loot boxes have many similarities to gambling. Despite this, organizations responsible for assigning age ratings to games such as the ESRB or PEGI do not specify if games contain loot boxes. A survey of parents (n=47) with children who play video games found that parents self-reported that they are less likely to agree with buying their child a game, or letting their child play a game, if labelled with 'Loot Boxes' as opposed to 'In-Game Purchases'. However, qualitative answers suggest that parents claim to be largely opposed to their children buying both loot boxes and in-game purchases. These results suggest there may be benefits to more specific labelling.

### Keywords

Loot Boxes, Video Games, Rating Labels, Gambling, Parental Awareness

## 1 INTRODUCTION & LITERATURE REVIEW

### 1.1 What is a 'Loot Box'?

Loot boxes are a form of microtransaction (a small, in-game purchase) within video games that players can purchase with real money, and offer randomised rewards (Zendle & Cairns, 2019). For instance, in *Counter Strike: Global Offensive*, players purchase 'keys' using real world money to open 'cases' containing designs for weapons and characters that are randomly distributed. A key feature of loot boxes is that they contain items with differing rarity, with the rarer items typically being more desirable and retaining a higher market value vs 'common' items being monetarily 'worthless'. As the contents of a loot box are randomised, players have no way of knowing if a crate contains an appealing item (Zendle et al., 2020).

The earnings potential of Loot boxes – and microtransactions in general – have become integral to many industry publishers. In 2019, Electronic Arts attributed 28% of their entire fiscal year earnings to *FIFA 2019 Ultimate Team* microtransactions, earning a net \$1.39b USD, with 'FIFA Packs' (another form of loot box) being their core microtransaction (Electronic Arts Inc. 2019). Further, Activision Blizzard and Take-Two Interactive Software attribute \$709M USD and 54% of their quarter 4 earnings respectively to 'recurrent user spending', with games such as *Overwatch* and *Grand Theft Auto: Online* not only being some of their top earners, but also games with these loot box mechanics that are fundamental to said earnings (Activision Blizzard Inc. 2019; Take-Two Interactive Software, Inc. 2019). Given how lucrative loot boxes are, it's unsurprising they are massively prevalent in video games today. For example, '54% of the top games on the Google Play store contained loot boxes and 34% of the top games on the Steam store contained loot boxes (Zendle et al., 2020)

## **1.2 Loot Boxes & Problem Gambling.**

The similarities between loot boxes and gambling are a growing concern for both academics and legislators. In paying to buy loot boxes, and paying to 'buy in' to a game of roulette, for example, both situations stake real money with the reward being uncertain. It's been hypothesised that there are so many shared mechanics and features between loot boxes and gambling, that loot boxes are psychologically akin to gambling (Drummond & Sauer, 2018). Griffiths (1995) identified that there are 5 characteristics that are common to gambling. These are:

- The exchange of money or valuable goods
- An unknown future event determines exchange
- Chance at least partially dictates outcome
- Non-participation can avoid incurring losses
- Winners gain at the sole expense of losers

In the aforementioned Drummond & Sauer paper (2018), 10/22 of the popular games with loot boxes identified met Griffith's criteria above.

Loot boxes are associated with problem gambling – disordered and excessive gambling-based behaviour that leads to problems in one's personal life. For instance, Brooks and Clark (2019) found a relationship between engagement with loot boxes and to gambling related cognitions (problematic gambling behaviour) in adult gamers, and that adult gamers were aware of this relationship. Further, exploratory analysis from two large-scale surveys found a significant association between loot box spend and problem gambling (Zendle & Cairns, 2018, 2019). Furthermore, the more money players spend on loot boxes, the higher the severity of their problem gambling (Macey & Hamari, 2019). With online gambling being a 'predictor of poor physical and mental health'(Scholes-Balog & Hemphill, 2012) and leading to higher average expenditures relative to non-Internet gamblers (Williams et al., 2011), the significance of these findings is concerning.

## **1.3 Are children opening loot boxes?**

Having established the links between loot boxes and Problem Gambling, it's now important to consider who actually uses loot boxes. In particular, if audiences below 18 years old are playing games that contain loot boxes. 93.1%, and 94.9% of the top grossing Android and iPhone games that feature loot boxes respectively were rated suitable for children aged 12+ (Zendle et al., 2020). In terms of console gaming, 59.1% of the most popular titles that contained loot boxes from the years 2016-2017 were rated 13+ and below (Drummond & Sauer, 2018). These statistics reveal that the potential for children to access loot boxes is high.

Other research confirms that children are using loot boxes. A survey of 2,943 11-16 year olds in the UK, revealed that “44% have paid money to open loot boxes/crates/packs to get in-game items within the game they were playing and 6% have bet with in-game items on websites outside of the game or privately” (Young People Gambling Report, 2019, p.2).

#### **1.4 Loot Box Interventions & Labels**

To reduce the impact of loot boxes on children, some countries have taken steps to regulate their distribution. For example, in Belgium, loot boxes have been banned outright (BBC News, 2019). In the United States, a bipartisan bill has been introduced that would prohibit the sale of loot boxes to anyone under the age of 18 (Kelly, 2019). However, loot boxes currently remain largely unregulated across the world, in contrast to how world-wide governments tend to carefully regulate traditional gambling.

The Entertainment Software Rating Board (ESRB) provides age-specific warning labels for any video games sold in North America. For example, age-ratings (e.g. 10+), content descriptors (e.g. Blood and Gore), and interactive elements (e.g. In-Game Purchases). In 2018, the ESRB began using the descriptor ‘In-game purchases’ on age-rating labels, and launched ‘Parentalcontrols.org’ in order to assist parents education on the topic (ESRB, 2018). While the ESRB labels do specify if a game has In-Game Purchases, and if a game has gambling (e.g. simulated poker), there is no distinction for games that contain loot boxes. For example, a game that allowed players to purchase additional levels would be given the same label as a game that had purchasable boxes with random rewards (ESRB 2020).

Some other platforms, such as the Apple App store, require their own, non-ESRB, digital variants of the ‘In-Game Purchases’ label. This is also seen in the replacement of the ‘free’ app button with a ‘get’ app button, to eliminate confusion about free applications that contain in-game purchases such as loot boxes (Bonnington 2014).

#### **1.5 Parental awareness of Labels**

From the outset, the usage of an ‘in-game purchases’ label appears reasonable. The ESRB claims that 87% of parents who purchase physical games for their kids are aware of the ESRB age ratings, with 77% of parents regularly checking the rating labels before purchasing a new game (*Ratings Awareness and Use Among Parents Remain High - ESRB Ratings*, 2019) This survey also revealed high levels of awareness for Content Descriptors (77%) and Interactive Elements (descriptors of certain features like player-to-player communication in game). Nikken et al. (2007) also identified that parents use labels in order to make purchasing decisions for the children, but did not ask about content such as gambling, randomized effects or in game purchases.

However, there is concern that the 'In-Game Purchases' label may not sufficiently inform parents about the nature of the transactions in the game. King & Delfabbro (2019) argue that the 'In-Game Purchases' label is limited, and fails to highlight the randomness of loot box rewards, the mechanics of their design, and the accuracy required for parents to make informed purchasing decisions based on the label alone. Furthermore, there is no information on the implementation of the in-game purchases, which could be remedied by more information being provided by the current warning labels (King et al. 2012). Mistry (2018) suggested that there needs to be clear visual indicators for parents that will catch their attention, such as "bearing a bright red label on the packaging that reads 'Warning: Contains in-game purchases and Gambling-like mechanisms that may be harmful or addictive'" (p. 573). The suggestions have not been adopted by the ESRB.

Failing to distinguish between in-game purchases and loot boxes poses a potential issue, as it is now up to parents to determine if the game contains loot boxes if they want to make an informed decision. To our knowledge, there is no research specifically investigating how the existing labels affect parents' perceptions and purchasing behaviour on video games containing loot boxes, and is an area that requires exploration.

## **1.6 Parental Awareness of Online Activity**

The responsibility of managing children's video game habits falls on their parents. This begs the question, how aware and informed are parents about their children's video game habits?

It has been identified that 90% of parents pay attention to the games their child plays, with 49% of parental limits on children's activities centred on 'playing computer and video games' (Entertainment Software Association, 2019). Furthermore, surveys indicate that most parents do set rules regarding their children's internet usage (Lenhart et al., 2007).

However, these parental self-reports of supervision may not align with adolescent self-report. In a Pew study (Lenhart et al. 2007), 62% of parents say they have checked up on where a child has gone and what they do online. However, another study found that only 33% of adolescents say that they believe their parents are following their online activities (Liau et al., 2008). Surveys have also indicated that 'the majority of online teens continue to engage in some online activities that their parents don't know about; 57% say they have created an account that their parents were unaware of, such as on social media site or for an app they wanted to use' (Generation App Survey Report, 2017, p. 2). This is compounded with the finding that 'only 18 percent of parents reported frequently viewing games prior to purchasing them', and this doesn't even consider free-to-play games which children can acquire without their parent's knowledge (Stroud & Chernin, 2008).

## 1.7 The Current Study

King & Delfabbro (2019) highlighted the need for a more transparent label about loot boxes. However, to the best of our knowledge there are no studies comparing the 'in-game purchases' label to a more specific 'Loot Boxes' label. There is also a lack of publicly available research on parental awareness and understanding of loot boxes.

As such, this study aims to identify:

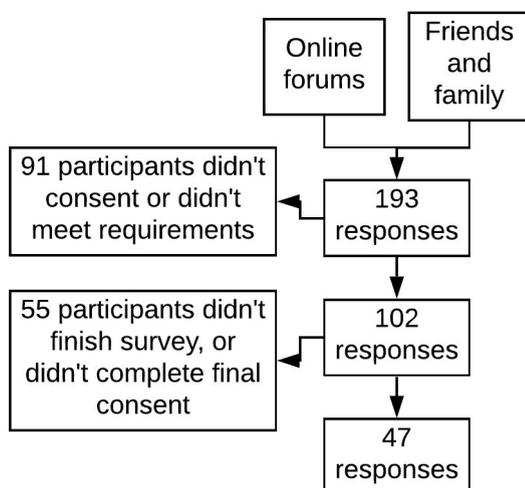
- What parents' perceptions and understanding of loot boxes are.
- How does the current ESRB 'In-Game Purchases' label affect parent's perception of a video game, relative to if they had seen a 'Loot Boxes' label.

## 2 METHODS

We conducted a between-groups, randomised experiment. The independent variable was which rating label participants were exposed to. The dependent variables were the agreement levels to 3 Likert items, and a series of open text responses.

### 2.1 Participants

Participants were recruited through a variety of online platforms including Facebook, Reddit, and parent forums, as well as friends and family. A full list of websites used for recruiting can be found in Appendix A. We received 193 responses, but only 47 met the full criteria to participate in our study (Fig.1). Participants were required to be over 18 years old, and a parent of at least one child between 3-17 years old who plays video games.



**Fig.1. Participant recruitment**

Ages of parents ranged between 23 and 64 years old (mean =40.0, sd= 7.6). 32 participants described themselves as male. 15 participants described themselves as female. The ages of their children ranged between 3 and 21 years old. (mean =10.1, sd= 4.1).

13 male participants and 8 female participants were randomly assigned to the 'In-Game Purchases' condition. The mean age of these participants was 39.5 (sd=7.2).

19 male participants and 7 female participants were randomly assigned to the 'Loot Boxes' condition. The mean age of these participants was 40.4 (sd=8.1).

Participants were not equally distributed across conditions, because some participants were deemed not eligible and removed after being randomly distributed into the conditions.

## **2.2 Procedure and Materials**

Upon agreeing to participate in this study, participants were taken to an online Qualtrics survey. Next they were presented with a researcher statement and an ethics form to sign. The ethics form informed participants could exit the survey at any point.

In order to avoid priming participants about loot boxes, or bias about loot boxes, it was not made clear that the study was aimed at investigating loot box perception, but rather rating labels in general.

Participants then completed two eligibility questions (whether they were over the age of 18, and that they had a child between the ages of 3-17 who played video games). If 'yes' was answered to both questions, participants could then move on to the experiment. We were primarily interested in the perceptions of parents who buy video games for their children. Therefore, we did not consider parents who only had children below 3 or above 17 years old, as we considered it unlikely that parents will buy video games outside of this age range.

Demographic information was then collected. This included participants' country of residence, age and gender, and how many children they had. We collected the age and gender of participants children as well. Participants were then asked how many hours a week they personally play video games, and how many hours a week their children play video games.

Participants were then randomly placed into one of two groups. One group was presented with a video game rating label as they exist currently (the In-Game Purchases group). The other group was presented with a video game rating label that had been redesigned to make it clear that the game involved loot boxes (the Loot Boxes group). See Fig. 2 below for detail.



**Fig.2. The 'In-Game Purchases' condition, and the 'Loot Boxes' condition**

The existing label for the In-Game Purchases group, on the left, is an example of a real ESRB rating label, that could appear on current video games. Our altered label includes a 'Loot Boxes' descriptor instead of In-Game Purchases.

We opted to choose an age rating of E (for Everyone) so that parents of younger children wouldn't only focus on the age rating. To try and increase realism, the labels were designed to mimic how they would look on the bottom left corner of a video game box.

After reviewing the labels, parents were asked how much they agreed with the following statements on a 5 point Likert scale of: strongly disagree, disagree, neither agree nor disagree, agree and strongly agree.

- I would buy this game for my child.
- I would let my child play this game.
- I would let my child use real money to make purchases within this game.

Each one of the Likert items was followed by a 'Why?' question allowing for open responses. After these questions, participants were then asked "In regards to video games, how would you define the term 'loot box'?" as an open question.

Upon completing the questionnaire, participants were debriefed on the research, and at this point it was made clear that the study was primarily measuring perceptions of loot boxes. Participants were issued a User ID that they were asked to record, and were told to contact the researchers with their ID if they wished to have their data removed from the study, or if they had questions or concerns, without compromising their anonymity.

### 3 RESULTS

To analyse both the quantitative and qualitative data, a mixed-methods approach was used. Responses to Likert items were treated as quantitative data, and answers to open text responses were analysed using thematic analysis.

#### 3.1 Quantitative Results

**Independent variable:** Label shown, either 'Loot Boxes', or 'In-Game Purchases'

**Dependent variable:** Likert scores on the following three questions:

1. I would buy this game for my child
2. I would let my child play this game
3. I would let my child use real money to make purchases within this game

**Hypothesis:** for all 3 Likert items, where  $\beta$  is the regression coefficient:

$H_0: \beta$  (Loot Boxes) = 0

$H_1: \beta$  (Loot Boxes)  $\neq$  0

Answers to the Likert items were converted to a numerical scale, where 1 corresponds to 'strongly disagree', and 5 corresponds to 'strongly agree'. Answers to each Likert item were analysed independently, as we have no evidence the Likert items are related concepts.

A linear regression model was chosen to analyse the quantitative results. It was chosen as we wanted to include a mix of continuous (Parent Age, Youngest Child) and categorical variables (Condition, Parent Gender, and Parent Gamer) in the analysis. We decided to select 4 additional variables based on what we thought might affect agreement. Parent Age was recorded numerically as a continuous variable. The Youngest Child variable is the age of the youngest child reported by each participant. The Parent Gamer variable was a True/False categorization of any parent who reported playing more than 0 hours of video games per week, on average.

**Table 1. Summary of conditions (higher scores equal more agreement)**

Condition	Likert item	n	mean	sd	median	min	max	range
In-game Purchases	I would buy this game for my child	21	4.3	0.9	5	2	5	3
	I would let my child play this game	21	4.2	1.1	5	1	5	4
	I would let my child use real money to make purchases within this game	20	1.9	1.1	1	1	4	3

Loot Boxes	I would buy this game for my child	26	3.0	1.4	3	1	5	4
	I would let my child play this game	26	3.5	1.2	4	1	5	4
	I would let my child use real money to make purchases within this game	26	2	1.0	2	1	5	4

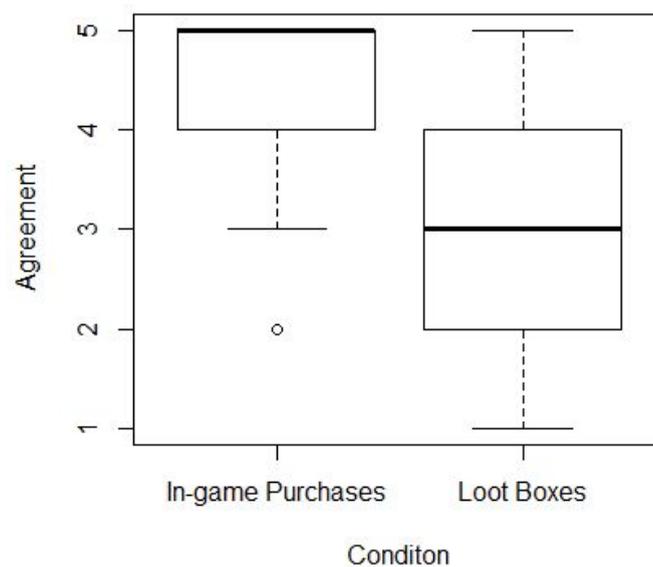
**Table 2. I would buy this game for my child, Linear Regression**

Condition	Estimate ( $\beta$ )	Std. Error	t value	p-value
Condition (loot boxes)	-1.32	0.36	-3.68	<0.01***
Parent Age	-0.01	0.03	-0.24	0.81
Parent Gender (Male)	0.96	0.45	2.12	0.04*
Parent Gamer (True)	-0.23	0.63	-0.36	0.72
Youngest Child	0.07	0.05	1.37	0.18

Significance. codes: (0\*\*\*), (0.001 \*\*), (0.01 \*)

Multiple R<sup>2</sup>: 0.35, Adjusted R<sup>2</sup>: 0.27

F-statistic: 4.40 on 5 and 41 DF, p-value: <0.01



**Fig. 3. I would buy this game for my child, Agreement across condition**

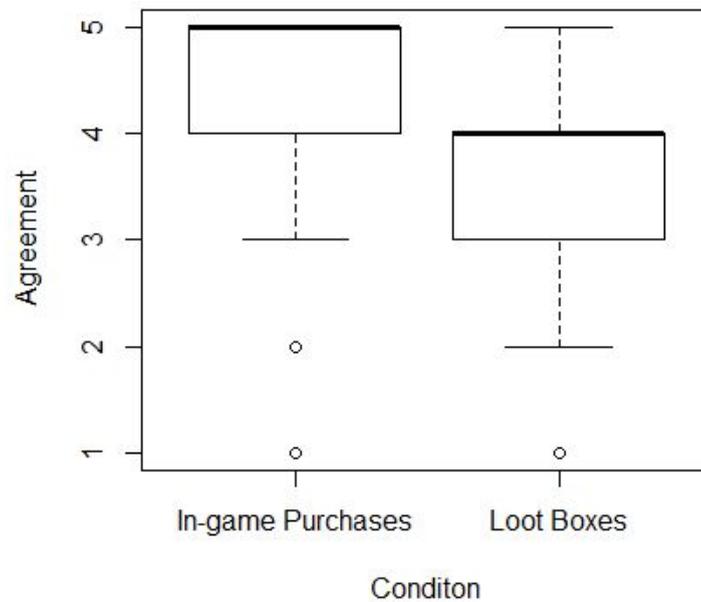
**Table 3. I would let my child play this game, Linear Regression**

Condition	Estimate( $\beta$ )	Std. Error	t value	p-value
Condition (loot boxes)	-0.83	0.36	-2.30	0.03*
Parent Age	-0.02	0.03	-0.95	0.35
Parent Gender (Male)	0.52	0.45	1.15	0.26
Parent Gamer (True)	0.11	0.63	0.18	0.86
Youngest Child	0.08	0.05	1.62	0.11

Significance. codes: (0'\*\*\*), (0.001 \*\*), (0.01 \*)

Multiple R<sup>2</sup>: 0.20, Adjusted R<sup>2</sup>: 0.10

F-statistic: 1.99 on 5 and 41 DF, p-value: 0.10



**Fig. 4. I would let my child play this game, Agreement across condition**

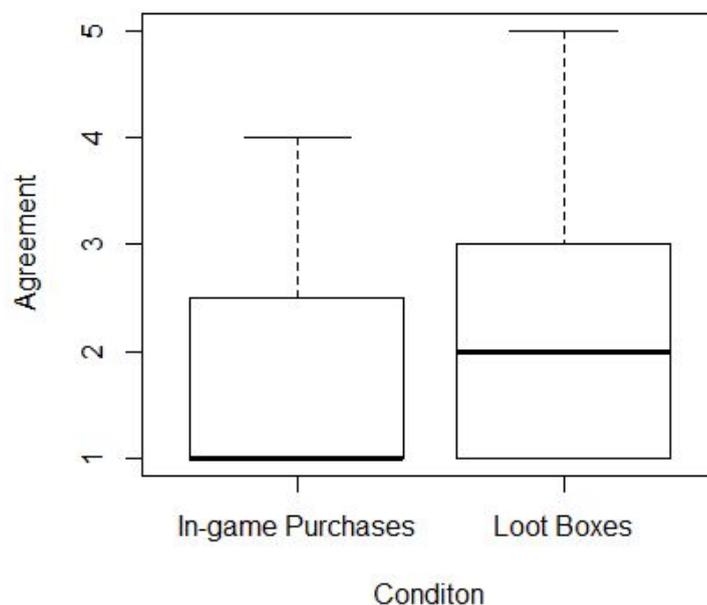
**Table 4. I would let my child use real money to make purchases within this game, Linear Regression**

Condition	Estimate ( $\beta$ )	Std. Error	t value	p-value
Condition (loot boxes)	-0.09	0.31	-0.30	0.76
Parent Age	0.00	0.02	0.18	0.86
Parent Gender (Male)	0.18	0.39	0.46	0.65
Parent Gamer (True)	0.82	0.57	1.44	0.16
Youngest Child	0.10	0.04	2.30	0.03*

Significance. codes: (0'\*\*\*), (0.001 \*\*), (0.01 \*)

Multiple R<sup>2</sup>: 0.23, Adjusted R<sup>2</sup>: 0.13

F-statistic: 1.99 on 5 and 41 DF, p-value: 0.056



**Fig. 5. I would let my child use real money to make purchases within this game, Agreement across condition**

After controlling for the reported variables, the average agreement on 'I would buy this game for my child' and 'I would let my child play this game' were significantly lower in the 'Loot Boxes' condition, at  $p < 0.01$  and  $p = 0.03$  respectively. There was no significant effect of loot boxes on 'I would let my child use real money to make purchases within this game'.

However, the adjusted values of r-squared were both relatively low at  $R^2 = 0.27$  and  $R^2 = 0.10$  respectively, suggesting that the variables selected do not explain much of the variance in participants' answers.

The same significant effects of the 'Loot Boxes' condition were detected when comparing across conditions for 'I would buy this game for my child' and 'I would let my child play this game' with a Brunner-Munzel test. Again, no significant result of 'Loot Boxes' was detected for 'I would let my child use real money to make purchases within this game' when using a Brunner-Munzel test

In exploratory analysis, two other effects were detected with linear regression. For 'I would buy this game for my child', there was a significantly higher agreement for male parents at  $p = 0.04$ . For 'I would let my child use real money to make purchases within this game', there was a relationship between the age of the participant's youngest child and agreement, at  $p = 0.03$  (The older their youngest child was, the more likely the parent was to agree).

However these last two effects should be treated carefully. Our experiment was not designed to strictly test for these variables, they are strictly exploratory. Furthermore, our sample size was not large at a total participant count of  $n = 47$ , of which 32 were male. No correction was made for multiple comparisons, as in each question we focused on the effect of condition, so only focused on 3 comparisons. Other analysis was purely exploratory.

### **3.2 Qualitative Results**

The qualitative data gathered from this study was analysed using thematic analysis, based on the procedure identified by Braun & Clarke (2006). After familiarizing ourselves with the data, we applied an open coding approach to generate initial codes. We used affinity mapping to create a dictionary of the emergent codes that could be seen in the data. Each single text response was considered one unit of meaning, and then coded individually by the researchers (4 coders total). Our first round of coding gave an intercoder reliability score of 0.72. We adjusted our code definitions, re-coded, and arrived at a new intercoder reliability score of 0.88. These codes allowed us to gain an overview of the main points that recurred throughout the data. We then identified patterns among our codes and generated broader themes. Five themes were identified from the open questions:

- In-Game Purchases
- Lack of Information
- Parental Role
- Rating
- Gambling

### 3.2.1 In-game purchases

This theme is defined by participants expressing their perceptions of in-game purchases in video games (not just loot boxes). Many participants were concerned with their children's use of in-game purchases, where they would be paying real currency for extra content. Participants in both conditions generally regarded in-game purchases negatively. For example, two participants noted:

*"If it's purely cosmetic stuff for real money, I'd try to teach them why it's a waste"*

*"If I pay \$60 or more for a game, I would want all features to be unlockable within the game, without paying extra for anything"*

When asked if they would allow their children to spend money in-game, another participant expressed disapproval of in-game purchases:

*"I never allow purchases in games, wasted money in my opinion"*

A common complaint among participants was that extra content provided by in-game purchases is not worth the cost. This is despite parents not being provided with any of the information showing the details or types of in-game transactions. This suggests that the term 'in-game purchases' already has a negative connotation among some parents.

We also found that when asked to define what a loot box is, the majority of participants identified loot boxes as a form of in-game purchase.

*"Real money for in game items. Varies from totally non-game affecting skins to usable upgrades/vehicles/etc..."*

*"A pay-to-win scam that is on par with gambling. You never know what you're going to get, but you're hoping for top-notch gear"*

From this data we can see that while not all parents are not able to identify what a loot box is, there is a certain level of awareness that loot boxes are a form of in-game purchase

### 3.2.2 Lack of information

Some participants highlighted that they did not have enough information to make an informed decision. This theme encompassed participants feeling they did not have enough information about the game or its content, how loot boxes or in-game purchases are implemented, or even what a loot box is.

When asked if they would purchase or let their child play the game with the provided rating label, some participants claimed they didn't have enough information or knowledge to make a decision.

*"By just looking at the label there is not enough info about the game"*

*"I don't know enough about the game based off of the information provided. What is the subject content, is it an online game, to what capacity are the loot boxes involved?"*

These results suggest that when making decisions around video game purchases for their children, parents don't only rely on the label, but also consider the context of the game. Furthermore, the specific implementation of in-game purchases and loot boxes matter as well. In other words, the label only makes up one element of a game's suitability for their children. While content descriptors aim to identify encounters and subjects that the player will be exposed to, they don't fully describe these features.

When asked to define a loot box, we received some answers such as:

*"I have no idea what that is"*

*"I don't know"*

These answers confirmed that at least some parents have no prior knowledge of loot boxes, or how they work, even after viewing a 'Loot Boxes' label.

### **3.3.3 Parental role**

Another theme that emerged was parental role. This concerned parental involvement in their children's video game play and purchases. These responses mentioned what is appropriate for their children, supervision, rules around play, and purchases.

When asked whether they would allow their child to make purchases within the game, different parents varied in their approaches.

*"One of our rules is free games only. No purchases"*

*"My children and I would need to talk about the amount they want to be spending on this game for additional purchases and whether or not that would equal getting less new games accordingly"*

*"So long as it's the money he's made himself I wouldn't see an issue"*

While this question typically received responses disagreeing with their children making in-game purchases, these quotes demonstrate a range of parental beliefs and approaches to supervision.

We also found that parents had different approaches when it came to supervising their child's gameplay. In one instance, when asked about whether they would allow their child to play the game, two parents answered

*"Only under my supervision"*

*"This is a game that they want and I am okay with my child playing any game".*

Again, this demonstrates that parents have varying levels of involvement in their children's playing habits.

### **3.3.4 Gambling**

One theme that emerged from our thematic analysis was gambling, more specifically responses that associated loot boxes with gambling. This theme included comments that used terms such as gambling, or implied it via terms such as 'lottery'.

When asked to define a loot box, we found that a large number of parents highlighted that loot boxes have a random aspect to them. For example, one participant defined a loot box as:

*"Randomized items, frequently cosmetic, which requires real money to purchase"*

Comments such as these demonstrate some participants identified gambling-like features in loot boxes, while not necessarily using the term 'gambling'.

Additionally, some participants did make an explicit association between loot boxes and gambling. One participant noted about loot boxes:

*"As a virtual gambling what has a chance. I understand why companies use them"*

Additionally, several participants brought up the issue of addiction:

*"At worst; gambling, at best; addictive enticement"*

was the answer one participant gave when asked to define a loot box. These results show that at least some parents directly link loot boxes to the negative aspects of gambling.

### 3.3.5 Rating

The majority of comments we received regarding whether the participants would buy or play the game, or let their child play it, concerned the age rating (E for everyone), and the content descriptor (Comic Mischief). For example, justifying a high agreement score for buying the game, one parent said:

*“Comic Mischief’ is not a big deal”*

We also found that a large number of comments saw no issue with the game as they found it to have no risks or be harmless, such as an answer which justified a high agreement score with:

*“It’s E rated”*

This may indicate that some parents perceive an ‘E for Everyone’ rating to mean that a game is harmless, regardless if it has loot boxes or not.

## 4 DISCUSSION

The “in-game purchases” label by the ESRB places the responsibility of regulating children’s usage of loot boxes on parents. However, it was unclear what parents’ perceptions and understanding of loot boxes were, nor was it clear how the current ESRB distributed label affected parents’ perceptions and behaviour when considering a game for purchase or play for their child. The present study provides key findings towards addressing these gaps in knowledge.

Parents’ agreement on ‘I would buy this game for my child’ and ‘I would let my child play this game’ were significantly lower for participants in the ‘Loot Boxes’ condition, at  $p < 0.01$  and  $p = 0.03$  respectively. Participants’ responses agree with this, as many participants explicitly mentioned loot boxes as justification for low agreement scores. However, it’s important to remember that the adjusted  $R^2$  values were  $0.27$ , and  $0.10$  respectively. This means that the majority of the variation in participant’s answers is not explained by the chosen variables in our linear regression. These findings are important because they suggest that adding clearer labels regarding loot boxes could help parents make better informed decisions.

Our thematic analysis revealed that some parents have negative perceptions of loot boxes, including that they are a waste of money. Some responses explicitly associated loot boxes with gambling and addiction. This is consistent with Brooks & Clark (2019) finding that many individuals outside of regulatory bodies and academia both consider loot boxes a form of gambling, and see them as a point of issue. However, our study was not designed to measure the extent of parental awareness of loot boxes, nor what variables contribute to an understanding of what loot boxes are.

No significant difference was found across condition for the question 'I would let my child use real money to make purchases within this game'. Additionally, responses largely disagreed with children making in-game purchases, regardless of if they thought the game contained loot boxes or not. It's unlikely this is due a total lack of parental awareness of loot boxes, as many parents in both conditions mentioned the core components of what loot boxes are (e.g. paying real money for random in-game rewards). Parents, both implicitly and explicitly, linked loot boxes to the elements of gambling defined by Griffiths (1995) such as 'The exchange of money or valuable goods' and 'Chance at least partially dictates outcome'.

Our study also proves that some parents don't know what loot boxes are. As a result, labels simply stating a game contains 'Loot Boxes' are unlikely to help all parents make information purchasing decisions. As the 'In-Game Purchases' label and our 'Loot Boxes' label were both inadequate at informing parents what loot boxes are, our study supports King and Delfabbro's (2019) suggestion that the current ESRB intervention is deeply limited and requires improvement to adequately inform parents of the design and dangers of loot boxes.

#### **4.1 Limitations**

One major limitation of this study is how generalizable the findings are. While relatively diverse in terms of age (23-64 years old) and geographically (14 different countries represented), many of our participants were recruited from online forums, some of which were about gaming. As a result, our participants may not be representative of the general population in terms of their perceptions of video game labelling or loot boxes. Furthermore, we only had 47 participants, which limits the generalizability of our results. Conducting a similar study with more participants, and a more diverse sample would be beneficial in addressing this limitation.

All values in this study were self-reported. We don't know if levels of agreement would correspond to actual differences in purchasing or parental behaviour. Therefore, it's possible that these results might not hold beyond our survey. It's also possible that 'in the wild' parents have different reactions to video game labels when contextualized on an actual video game box. For example, perhaps when holding a box, parents pay less attention to the label, as they focus on the imagery or game title instead. This could be addressed by using actual purchasing data.

#### **4.2 Further work**

While our study can provide some insight into how parents perceive loot boxes, we can't draw any definite conclusions on what percentage of parents know what a loot box is. Future studies could aim to answer this question with large scale surveys. This information would be helpful in determining how much information needs to be provided in order for parents to make an informed decision when purchasing games for their children.

Additionally, in this study, many participants did not know what loot boxes are, and some participants responded it was hard to evaluate the appropriateness of the game without having more specific details of the implementation of in game purchases and loot boxes. As a result, it may be interesting to evaluate the effect of labels or packaging that provides a detailed explanation of what loot boxes are, and how they are implemented in-game.

## **5 CONCLUSION**

Our experiment provides preliminary evidence that 'Loot Boxes' labels may lower parent's agreement on letting children buy, and play video games, in comparison with 'In-Game Purchases' labels. Qualitative answers from participants in the 'Loot Boxes' condition confirmed that at least some parents specifically objected to their children having access to loot boxes. This suggests that 'In-Game Purchases' labels, as they currently exist, may not give parents sufficient information to make knowledgeable purchasing decisions.

There was no significant effect of loot boxes on whether parents reported agreeing to let their children make in-game purchases. This is possibly due to parents being generally opposed to children making any in-game purchases of any kind. The qualitative data suggests this as well - participants in both conditions highlighted their objection to children spending money in-game, whether that be microtransactions, pay-to-win features or loot boxes. This is consistent with statements from the ESRB that parents are more concerned about "how much their kids might spend" as opposed to the specific things being purchased (Tassi 2018).

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## APPENDIX

### Appendix A. Sources of participants

#### 1.Reddit Communities

<https://www.reddit.com/r/SampleSize/>  
<https://www.reddit.com/r/origin/>  
<https://www.reddit.com/r/RedditForGrownups/>  
<https://www.reddit.com/r/SurveyExchange/>  
<https://www.reddit.com/r/PuzzleAndDragons/>  
[https://www.reddit.com/r/Kings\\_Raid/](https://www.reddit.com/r/Kings_Raid/)  
<https://www.reddit.com/r/WorldOfWarships/>  
<https://www.reddit.com/r/Neverwinter/>  
<https://www.reddit.com/r/Madden/>  
<https://www.reddit.com/r/Rainbow6/>  
<https://www.reddit.com/r/Paladins/>  
<https://www.reddit.com/r/archeage/>  
<https://www.reddit.com/r/StreetFighter/>  
<https://www.reddit.com/r/takemysurvey/>  
<https://www.reddit.com/r/Steam/>

#### 2.Parental Forums

<https://www.mumsnet.com/>

#### 3.Facebook Groups

<https://www.facebook.com/groups/254127108328951/>  
<https://www.facebook.com/groups/DaDyCommunity/>  
<https://www.reddit.com/r/daddit/>  
<https://www.facebook.com/groups/458699610922086/>