# How can the potential harms of loot boxes be minimised?: Proposals for understanding and addressing issues at a national level

JOSEPH MACEY[1,2]* , MIKKO CANTELL[3], TOMMI TOSSAVAINEN[4], ANTTI KARJALA[3] and SARI CASTRÉN[5,6,7]

[1] Centre of Excellence in Game Culture Studies, University of Turku, Porin Yliopistokeskus, Pohjoisranta 11d, 28100, Pori, Finland

[2] Gamification Group, Tampere University, Kalevantie 4, 33100, Tampere, Finland

[3] National Police Board, Gambling Administration, PL 50, 11101, Riihimäki, Finland

[4] National Audiovisual Institute, P.O. Box 16, FI-00501, Helsinki, Finland

[5] Finnish Institute for Health and Welfare, Health and Well-Being Promotion Unit, P.O. Box 30, FI-00271, Helsinki, Finland

[6] Department of Psychology and Speech-Language Pathology, University of Turku, Social Sciences, P.O. Box 30, FI-00271, Turku, Finland

[7] Department of Medicine, University of Helsinki, P.O. Box 30, FI-00271, Helsinki, Finland

## ABSTRACT

*Background and aims:* Loot boxes are in-game items which distribute rewards to players via random-number generation; many games require players to make in-game payments to access their contents. The combination of financial outlay and random rewards has raised concern about similarities to gambling. This debate paper presents a series of themes identified by an inter-institutional working group in Finland, alongside suggested actions, and are presented with the intention of stimulating debate among stakeholders. *Methods:* This work uses an exploratory research approach to gather data from a range of sources, including state-of-the-art reports from several fields and qualitative content analysis of invited presentations from a range of stakeholders, including affected individuals, practitioners, and field-specific experts. *Results and Discussion:* Several significant themes emerged from the work and are presented alongside a series of proposed action points. Based on this preliminary exploration we propose a series of, non-exhaustive, actions for both primary and secondary prevention. Furthermore, the group identified the potential for responsible gaming practices to be adopted which would help to minimize the harm from overspending in gaming activities. Finally, we identified the need for further research in the field, for example the use of player data and both longitudinal and qualitative studies. *Conclusions:* The emergent themes are discussed in relation to both the views of the presenters and existing research in the field and are intended to promote discussion concerning the viability of context-specific approaches to an issue of global reach and significance.

## KEYWORDS

video gaming, loot boxes, convergence of gambling and gaming, gambling, regulation, harm minimisation

*Corresponding author.
E-mail: jrmace@utu.fi

# INTRODUCTION

The issue of loot boxes in video games has gained increasing attention across a range of spheres in recent years, these areas include mainstream media, national governments and

regulators, the games industry, player communities, and academia. The term "loot box" is an umbrella for in-game items which distribute rewards to players by means of random-number generation, that is, that when opened these boxes will grant players a random selection of items from a pre-defined reward pool. While some loot boxes are provided to players for free, many games require players to make in-game microtransactions in order to access their contents (Macey & Hamari, 2019).

The combination of financial outlay via micropayments and the random allocation of rewards has raised concern about the potential similarity between buying loot boxes and participating in gambling (Drummond & Sauer, 2018; Drummond, Sauer, Hall, Zendle, & Loudon, 2020; Li, Mills, & Nower, 2019). Indeed, a number of regulatory bodies have issued guidance on the topic of loot boxes, while there are several ongoing investigations into the issue (Derrington, Star, & Kelly, 2020).

In addition to legal and regulatory investigations, loot boxes have also been subject to a growing number of academic studies, with associations being observed between the practice of paying to open loot boxes and behaviours which either resemble problematic gambling or are symptomatic of problem gambling (Garea, Drummond, Sauer, Hall, & Williams, 2021; Zendle & Cairns, 2018). This appears to be as a result of the way in which loot boxes employ psychological mechanisms akin to those employed in the gambling industry, for example utilizing audio-visual presentation techniques which are reminiscent of slot machines, employing variable-ratio reward schedules, and so on (Kao, 2019; Larche, Chini, Lee, Dixon, & Fernandes, 2021). The similarity between paying to open loot boxes and gambling has been supported by work which highlights the fact that virtual items are valued in the same way as real-world items and that they should be considered under existing gambling legislation. However, many current legislative approaches have been found to be based on a somewhat "archaic" perspective that digital items have no real-world financial value (Drummond, Sauer, Hall, Zendle, & Loudon, 2020). Furthermore, research has revealed that video game players who indulge in gambling, and gambling-like behaviours, endorse cognitive frameworks which differ from more traditional attitudes toward gambling, highlighting the particular characteristics of this population in regard to development of disordered consumption patterns (Macey & Hamari, 2020).

While not all individuals who pay to open loot boxes go on to develop potentially problematic consumption behaviours, research has also highlighted the way in which loot boxes facilitate gambling in unregulated environments and increase ease of access to gambling for under-age individuals (Greer, Rockloff, Browne, Hing, & King, 2019; Griffiths, 2019; Macey, Hamari, Sjöblom, & Törhönen, 2021). Indeed, the role of microtransactions in general, and loot boxes in particular, has been highlighted as being a potentially exploitative means of monetizing consumers (King et al., 2019; McCaffrey, 2019).

The financial success of this business model has been so significant that it has come to dominate the contemporary games market, indeed, many games which were already successful have fully converted to the free-to-play (F2P)

model in order to further increase profitability. In addition, even those games which are not F2P, and which utilize a traditional up-front purchase model, have now incorporated loot boxes as a means of further increasing long-tail monetization of players (Karlsen, 2020; Prati, 2019).

To date, attempts to mitigate the potential harms of loot boxes, whether in regulatory, academic, or practitioner contexts, remain somewhat isolated within their respective silos. While it is the case that some authorities have sourced contributions from a range of parties when assessing the legal status of loot boxes (Parliament of Australia, 2018), this is often by invitation. Such investigations are predominantly restricted to gambling regulators, indeed, exchange of information between government bodies regarding the potential impacts of loot boxes varies between jurisdictions and can be limited.

This situation is further complicated by the disparity between national and international approaches to regulation and between social and legal definitions of gambling (Abarbanel, 2018; Derrington et al., 2020; McCaffrey, 2019). Often the debate about regulation pits service providers against governments or authorities, resulting in conflict or sub-optimal compliance rather than encouraging an approach promotes bipartisan solutions (McCaffrey, 2019; Xiao, Henderson, Yang, and Newell, 2021). Finally, there are many charities, NGOs, and individual practitioners who have amassed knowledge working with individuals at the grass roots level, and it would be beneficial if such experiences could be utilised alongside other expert voices.

In order to investigate the socio-cultural, economic, and regulatory implications that have arisen in Finland as a result of the growing presence of loot boxes in contemporary digital games, an informal working group was established. The working group is comprised of representatives of a number of Finnish authorities and institutions (see below). In order to achieve the overall aims of the group, several stages are needed; the initial course of action agreed by the members of the group was to identify emerging themes and concerns related to the spread of loot boxes, and to identify potential actions to address these concerns, as presented in this paper.

This debate piece presents a series of themes identified by the working group and the associated action points, the intention is to stimulate debate among diverse stakeholders (governmental bodies, academics, businesses, clinicians, and grass-roots practitioners), and to promote discussion concerning the viability of context-specific approaches to an issue of global reach and significance. The remainder of this paper is divided into the following sections: a description of the working group; a description of the exploratory research design; and the key output of the working group to date, including a) an outline of the current situation regarding loot boxes, and b) emerging topics in the area and potential actions to address these areas of concern.

## THE WORKING GROUP

The working group is an informal group of experts in nature, seeking to function as a platform for streamlined
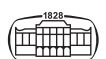
exchange of information and communications on matters related to loot boxes and digital gaming. The working group was formed in 2020 around mutual interests of different actors: the Finnish Institute for Health and Welfare (THL), the National Audio-visual Institute KAVI, Tampere University, The University of Turku, and the National Police Board. Initially, the Consumer and Competition Authority was also part of the group. Each member of the group has extensive experience of loot boxes in their respective fields, occupying either a regulatory/supervisory role or other specific role related to loot boxes and/or digital gaming.

The working group was created at the initiative of its founding members and has no direct financial support from any institutional body or other organization, members of the group participate as part of their existing roles and responsibilities in their host body. Membership in the working group has, to date, been limited to those working in public authorities and academia with potential new members being proposed and invited to participate on an ad hoc basis. Outside views such as those from the gaming industry and organizations working in the field of problem gaming and addiction are strongly valued and have been heard as invited speakers.

Although membership of the working group has been limited to academia and national authorities, a primary aim has been to investigate loot boxes from a wide range of perspectives. In this way, the working group seeks to develop a holistic understanding of the environment and issues that arise out of the growing presence of loot boxes in contemporary digital games. Accordingly, four guest speakers were invited to present their personal and professional experiences related to loot boxes (see below); these guests have been chosen to complement and expand upon the knowledge base of the existing members.

## RESEARCH DESIGN AND METHODOLOGY

In order to examine the issue of loot boxes, in particular regard to the Finnish context, it was decided that the most productive approach to adopt would be that of exploratory research, one that incorporates both flexibility and open-mindedness (Stebbins, 2001). Exploratory research was deemed to be the most suitable approach in order to gather data from a range of sources, including affected individuals, practitioners, and field-specific experts.

### State -of –the- art

The first round of data gathering consisted of compiling reports on the state-of-the-art in the various fields represented by members of the working group: academia; legal and regulatory; and media education. The reports were drafted by the relevant members and were based on a combination of literature reviews, personal experience, and expert knowledge of the field. These reports formed the basis for the section titled "output, stage one", below.

### Themes emerging from invited presentations

The second stage of data collection was based around a series invited presentations, described below, given to the working group. Content analysis was performed on both contemporaneous notes made by group members and the slides that formed the basis of the presentations and which were made available to the group after each presentation. An initial list of themes emerging from the data, accompanied by explanatory text, was compiled by a single member of the group and circulated to the remaining members for comment; any proposed amendments were made individually and discussed by the group as a whole before being accepted or rejected. Action points addressing each theme were proposed and discussed among the group. The finalised list of themes and actions were then reviewed by a different group member than that which compiled the original list in order to ensure that the content of the presentations was accurately represented. It must be stressed that the presentations were based on individuals' personal and professional experiences, as such the themes which were extracted via content analysis are interpretive and cannot be considered as objective fact.

### Participants and procedure

To date, presentations have been made by 1) a legal scholar; 2) an individual with a background in problematic gaming and gambling; 3) a representative of the Finnish games industry; and 4) a project manager from an NGO working with problematic gaming and gambling in the community. Presenters were proposed by individual members of the working group, the members made their suggestions to the rest of the group, along with their reasons for proposing each individual, prior to the invitation being extended.

Each presentation lasted approximately one hour and was delivered to the group via an online video conferencing platform; all participants were provided with the same set of four questions which guided their presentations but were free to include any additional content they deemed relevant.

Having completed the initial rounds of knowledge gathering, the working group used the knowledge gathered during the legal and academic reviews to complement the knowledge and personal experiences provided by the invited presenters. All participants have provided their consent for us to present a summary of the key themes arising from each presentation, provided below in Table 1[1]. These themes, and the associated action points, are provided below and summarised in Table 2, they are not intended to function as a definitive list but, instead, are intended to stimulate discussion among stakeholders and interested parties.

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[1]Participant details have been anonymized and potentially identifying information has been removed at their request.

*Table 1.* Overview of Invited Presentations

| Presenter | Topic/Theme | Summary of main discussion points |
|---|---|---|
| A Legal Scholar | A jurisprudential view on the Finnish Lotteries Act and Loot boxes | Stressed the need to consider issues of consumer protection legislation, rather than solely consider gambling regulation.<br>Raised the potential impact of evolving European legislation on digital commerce.<br>Highlighted to educational possibilities of developing an informational pamphlet as potential concrete tool. |
| Person with lived experience in problematic gaming and gambling | Personal experiences and insights | Highlighted the possible transition from gaming to gambling and vice versa.<br>Suggested a range of possible protection measures.<br>A greater need for research was identified.<br>Stressed the necessary presence of consumer voices in the ongoing debates.<br>Raised the importance of youth work channels as a means of delivering more information and access to target groups.<br>Establish a clear understanding of responsibilities related to loot boxes through a mapping exercise. |
| Representative of the Finnish games industry | Understanding loot boxes from the point of view of Finnish and European gaming industry. | Provided an industry perspective of the phenomenon.<br>Highlighted difficulties combatting illegal or inappropriate advertising, particularly that which uses pop-ups.<br>Highlighted potential concerns surrounding the provision of data to authorities/researchers as a result of GDPR regulations.<br>Informed that the gaming industry would be willing to collaborate with research if certain conditions met and there is clear, prior knowledge of needs.<br>Provided a range of useful references/resources, including: Swedish consumer authority (cooperation with Consumer authority), and EP study (recommended wider CP angle). |
| Project manager from NGO working with problematic gaming and gambling in the community | The prevention and treatment of problems related to disordered gambling and gaming | Stressed the fact that many false beliefs related to gaming and gambling exist among players, and that accurate reliable information is sorely needed.<br>Highlighted the fact that awareness of gambling exists prior to youth turning 18; they are often ready to participate in gambling when legal age limit is reached.<br>Social media influencers could be central to tackling problems.<br>The viability of fines or other punitive fees was discussed as a means to address the issue.<br>Parents' awareness is the key to addressing and preventing problems in young people.<br>The main goal should be to enhance preventative actions through the promotion of healthy decision making by individuals and parents. |

*Notes:* EP =, CP = Consumer protection.

# OUTPUT, STAGE ONE: STATE-OF-THE-ART REPORTS

## What are loot boxes

There are many different types of loot boxes featured in contemporary video games, the most fundamental classification criteria being: costs of opening (payment), and type of reward (contents). "Payment" refers to whether a loot box is provided to players free of charge, for example as a result of completing a specific in-game task, or if they are required to purchase a "key"[2] in order to open it (Macey and Hamari, 2019a). Whereas "contents" refers to whether the rewards have a direct influence on the gameplay, such as power-ups or

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[2]"Keys" for loot boxes are digital codes which authorize opening, some games allow players to store keys in their inventory for later use while others require immediate use.

*Table 2.* Proposed actions to address key issues related to the presence of loot boxes in video games, as identified by the working group

| Key Issue | Proposed Actions |
| --- | --- |
| Regulation | Increase transparency (require publication of drop rates, use of clear language, etc.). |
| | Increase regulation, potentially adopt practices derived from responsible gambling programmes. |
| | Clear mandate for relevant authorities, not limited to gambling regulators. |
| Research - 1 | Improve access to data in collaboration with the game companies. |
| | Establish a standardized process for submitting, and responding to, requests for data. |
| | Initiate longitudinal research on gaming habits and gambling. |
| | Additional funding for research into the convergence of gaming and gambling. |
| Research - 2 | Qualitative research on video game players who spend money on loot boxes in order to: |
| |    a) Identify relevant target groups. |
| |    b) Identify the best ways of reaching the targets groups. |
| |    c) Identify suitable actions according to characteristics of individual target groups. |
| |    d) Provide affected individuals with a voice. |
| Industry | Clearly display the sum amount of money spent within the game; display values in real-world currencies, not in-game currencies. |
| | Help video game players set monthly spending limits and provide players with regular updates on spending. |
| | Develop processes to facilitate the refund of unauthorized spending by minors which are easy to navigate and have rapid turnaround times. |
| | Require all in-game microtransactions to be authorized using secure personal banking codes. |
| | Provide information and assistance to gaming companies to help them identify problematic behaviours. |
| | Draft consumer protection legislation governing the use of microtransactions in digital games. |
| Awareness | A Joint National Campaign in collaboration with the Relevant Actors to raise awareness. |
| | Produce educational materials/resources directed at specific target groups. |
| | Identify and utilize most appropriate communication channels to reach target groups, for example social media influencers/personalities. |

*Note:* Please see sections 6.1–6.5 (inclusive) for full description of key issues.

in-game currency, or if they are simply cosmetic items which are often graded according to rarity (Macey & Hamari, 2019b; McCaffrey, 2019; von Meduna, Steinmetz, Ante, Reynolds, & Fiedler, 2020). Furthermore, some rewards obtained via loot boxes can be transferred between players or exchanged for real-world currencies via online marketplaces. Other rewards cannot be transferred and are tied to an individual player's account (Abarbanel & Macey, 2019; Greer et al., 2019).

It is hard to estimate the exact amount of money raised by the sale of loot boxes for a number of reasons, primarily due to the reluctance of the industry to make such figures publicly available. However, in 2019, the developers of Overwatch released figures showing that the game generated over $1bn from micropayments; although purchases are not limited to loot boxes, they are the primary focus (Bailey, 2019). These figures relate to micropayments before the Covid-19 pandemic, which has greatly increased the amount of time and money spent on gaming in the previous year (Ellis et al., 2020). Indeed, there are some indications that spending on loot boxes may have increased as a result of the pandemic (Hall, Drummond, Sauer, & Ferguson, 2021). Similarly, in 2020 the net revenue for Electronic Arts' FIFA Ultimate Team platform was $1.49bn, while across all games Electronic Arts derived $2.8bn from "live services" (e.g., in-game microtransactions) compared to $809m from the sale of full games. As with Overwatch, these figures include all forms of spending, but the microtransactions are primarily focused on the purchase of "card packs" containing

randomly allocated contents (Michael, 2020). Unlike Overwatch, however, the basic game is not free, and players must purchase the game before any further costs are incurred. Microtransactions, and loot box purchases in particular, have proven to be highly profitable for games companies.

## Current legislative approaches

Legislative and regulatory attitudes to loot boxes are determined at the national level and, as a consequence encompass a range of approaches, however, the one constant is that they are considered in reference to existing legislation addressing the practice of gambling. Within Europe alone there are significant discrepancies between neighbouring countries and authorities as to the ways in which loot boxes are considered. In 2017, the UK Gambling Commission stated that, although they are "concerned" about the increasing convergence of gaming and gambling, existing legislation cannot be applied as the virtual items obtained from loot boxes cannot be considered as constituting "money, or money's worth". However, the same year saw the Isle of Man rule that virtual items are considered money's worth and, therefore, that loot boxes fall under existing legislation governing gambling. Similarly, in 2018, the Netherlands Gaming Authority stated that they consider any loot boxes whose contents can be traded outside the game from which they originate, and which have a "market value" as constituting gambling. An alternative approach was adopted by

the Belgian Gaming Commission who judged that any loot box which requires payment to open constitutes gambling, irrespective of the nature of the prizes provided therein (Greer et al., 2019; McCaffrey, 2019).

At the time of writing, the working group is unaware of any judicial judgements regarding the legal status of loot boxes in Nordic countries other than Finland. We are, however, aware that the gambling regulators in Sweden and Denmark have suggested that some forms of loot boxes could be considered as fulfilling the existing criteria for gambling if the stake and the prize can be converted into real-world currencies (McCaffrey, 2019).

We are aware of developments in other regions, including North America and Asia, for example proposals to review the use of virtual items for betting under existing US legislative frameworks addressing wire fraud (Holden, 2017), or the introduction of laws requiring publication of odds relating to potential prizes (Xiao et al., 2021). However, we have chosen to concentrate upon legislative processes and social contexts which are closer to that in which the working group operates. An expanded review is planned which will encompass differing global approaches to legislative efforts addressing loot boxes and the lessons learned from such actions.

## Legal status of loot boxes in Finland

Loot boxes are not subject to explicit regulation within Finland, instead they are subject to contextual factors; depending on the legal viewpoint and individual circumstances under which they are accessed, loot boxes may or may not be classified as a lottery for goods, (virtual) goods or services, or gambling (Cerulli-Harms Münsch, Thorun, Michaelsen, and Hausemer, 2020; Drummond, Sauer, Hall, et al., 2020; McCaffrey, 2019).

The Gambling Administration of the National Police Board has stated[3] that although loot boxes with non-monetary rewards cannot be considered gambling under the Lotteries Act (1047/2001), when the elements are met for participation charges, chance, and a profit of monetary value, it is likely that they meet the definition of an illegal lottery; consequently, they would be deemed to be illegal within Finland. The Gambling Administration emphasized that loot boxes are not against the law, per se, providing the mechanisms which actualize the criteria of lottery are remedied.

In addition to the Lotteries Act, loot boxes can also be evaluated from the perspective of gambling under the Criminal Code (39/1889). To date, loot boxes have not been classified as gambling in the context of the national legislation, although loot boxes have been noted to have gambling-specific characteristics and features. The case law is yet to evolve in this respect, however, the issue of loot boxes has recently gained increased levels of interest in legal literature. The primary legal uncertainty yet to be tested is whether loot box mechanics would constitute lotteries, as regulated in the Lotteries Act, or gambling, as regulated in the criminal code.

Ultimately, loot boxes are subject to general consumer protection legislation, from the viewpoint of the Consumer Protection Act (1978/38), regarding sales of consumer goods and services; the concept of information transparency therein would effectively require disclosure of the odds of obtaining certain virtual items through loot boxes.

We can see, therefore, that decisions relating to the potential regulation of loot boxes, and any similar virtual items, are highly contextual and require a range of experts from all relevant authorities in order to make meaningful assessments. Furthermore, the dynamic and fast-paced nature of developments in digital environments often mean that existing legislative frameworks are not sufficient to address novel products and services.

## Research and recommendations for future studies

The potential connections between video-gaming and gambling have been of interest to academic research since 1990s. These two activities share many structural similarities and several studies have examined the relationships between gambling, video-game play, and problematic video-game play. So far, the results of these studies are mixed: association between problematic video-gaming and gambling vary from moderate to weak (Macey & Hamari, 2018; Li et al., 2019; Sanders & Williams, 2019). In recent years, these associations have been investigated in reference to loot boxes, with such purchases having been found to be associated with problem gambling behaviours (Garea et al., 2021). Several studies suggest that those who are higher risk gamblers may be particularly attracted to gambling and gambling-like content in games (Drummond, Sauer, Ferguson, & Hall, 2020; Gainsbury, Abarbanel, and Blaszczynski, 2017; Garea et al., 2021). Due to the correlational nature of many studies the precise nature of the relationship is unclear; it is not known whether loot-boxes lead players to gamble or if loot-boxes provide an avenue for those who are vulnerable to risky consumption practices. Current research topics and recommendations for further studies are examined in more detail below.

***Video game monetization and social responsibility.*** Currently, the possible risks and harms associated with the consumption of monetised games are not fully understood, particularly considering that the majority of research uses data which is self-reported and cross-sectional. Further research which investigates the impact of convergent activities, especially monetised products, is required; such research should include both the identification of vulnerable consumers and the development of productive approaches to reduce gaming and gambling-related harm (King & Delfabbro, 2020; King et al., 2019; Király, Zhang, Demetrovics, & Browne, 2021). Xiao and Henderson (2021) further highlight the need for video game companies to adopt better social responsibility measures and follow an

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[3]POL-2018-22730, available in Finnish: https://poliisi.fi/arpajaiset-ja-raha pelit.

ethical game design framework. In addition, there have been calls for policymakers and invested parties to: encourage socially responsible behaviour on the part of the games industry, and to ensure that it is accountable; to promote sustainable and responsible gaming practices; and to proactively seek to enhance consumer welfare, particularly in respect to families, children and adolescents (Abarbanel, 2018; Király et al., 2021).

Research has suggested that as a result of associations with problematic behaviours, whether gaming or gambling, purchasing loot boxes may be associated with mental distress. Yet, as the data gathered was cross-sectional, the temporal relationships between purchasing loot-boxes, engaging with video gaming and/or gambling, the development of problematic consumption behaviours, and mental distress could not be ascertained (Li et al., 2019). Therefore, it is necessary to gather data across a range of time points in order to clarify the direction and nature of these interactions and relationships.

Further research is needed in a range of areas, notably the investigation of the various implementations of online video game monetization and the relationships to the onset of problematic gaming behaviour and gaming-related harms, in particular the ways in which children are encouraged to use in-app purchases (Király et al., 2021). In addition, there is a need for optimal approaches to be identified in respect to: industry activities and approaches, the education of players, and the design of appropriate and meaningful interventions (King & Delfabbro, 2018; Xiao & Henderson, 2021). Király et al. (2021) noted that a much-needed area of research is to investigate and promote parental knowledge as a preventative initiative.

***Loot boxes and problem gambling.*** Research has revealed positive relationships between the amount of money spent on loot boxes and the severity of problem gambling (Spicer et al., 2021; Wardle & Zendle, 2021) with the relationship persisting irrespective of whether or not loot boxes provided in-game advantages, could be traded for real world money, the ability to "cash out" any winnings, utilising "near-misses", and the option to use in-game currency to purchase loot boxes (Zendle, Cairns, Barnett, & McCall, 2020). A noteworthy point is that the underlying reason for this association between loot box purchasing and problem gambling is unclear; it may be explained a) by the gateway theory, or b) that loot box features are particularly attractive to existing problem gamblers. In this research it was found that loot boxes are not a gateway to gambling but elicit problem gamblers' self-destructive behaviour. Some have highlighted the potential for regulatory bodies to consider developing content descriptors specific to loot boxes or placing age restrictions on games which contain paid loot boxes, or adopting practices based on those of responsible gambling initiatives (King & Delfabbro, 2019; Király et al., 2021; Xiao & Henderson, 2021).

Similarly, Drummond and Sauer (2018), Drummond, Sauer, and Hall (2019), Drummond, Sauer, Hall, et al. (2020) discuss the need for regulatory actions in respect to games containing loot boxes. Games in which players can sell or exchange virtual items obtained via purchasing loot boxes are presented as an obvious example of gambling in video games and should be restricted to people of legal gambling age. They identified two other categories of games which could be of interest to regulators: a) those that meet the psychosociological definition of gambling, but in which winnings cannot be cashed out; and b) those that do not mee the psychosociological definition, but which include the payment of real-world currency for randomized rewards. Further research is needed to identify whether such games result in adverse consequences for players.

More recently, a study by Drummond, Sauer, Hall, et al. (2020) found that more money is spent on loot boxes by those who exhibit higher degrees of problem gambling than those without such symptoms. Furthermore, the study found that an even greater risk factor is the combination of problem gambling symptomology and excessive video game play. A causal relationship could not be established, accordingly, future research examining potential causality is a priority. It is, therefore, important to explore motivations for purchasing loot boxes in the future would be beneficial, as noted by von Meduna (2020).

***Loot boxes, games, and virtual items.*** Loot box rewards are often graded by rarity, research shows that receiving more desirable rewards increased levels of arousal and the urge to open more (Larche et al., 2021), providing important insights into the ways in which these gambling-like activities can drive problematic consumption behaviours. The study was experimental in nature, using video as an apparatus for loot box stimuli, as a result the authors recommend that further research replicates their study in a natural setting.

Brook and Clark (2019) explored relationships between game play, opening loot boxes, problematic gambling behaviours, and cognitions related to gambling, finding that gambling-related variables predicted potentially problematic loot box usage (Risky Loot-box Index scores). A recent study further replicated the original finding that specific beliefs or risky cognitions (in the Index) include: the compulsion to open more boxes, playing for a longer period of time than originally intended, and purchasing further loot boxes if not receiving an item of value. In addition, the replication study found statistically significant positive relationships between loot box spend and both positive and negative mood (Drummond, Sauer, Ferguson, & Hall, 2020). Yet further research is needed to develop questions that assess specific beliefs pertaining loot boxes. In addition, a recent study found that a common, extant measuring for assessing gambling-related cognitions (GRCS) did not apply directly to video game players who also gamble (Macey & Hamari, 2020). In order to address this issue, they developed and presented a new scale (GamCog), the generalizability of this measure to different settings requires further research.

Finally, a relatively new area of research relates to the phenomena of esports betting and skin gambling, and their convergence with gambling. Early evidence indicates that those who bet on esports may go on to develop a greater

degree of involvement with gambling and are more likely to experience negative consequences of gambling. In fact, Macey and Hamari (2018) found that increased engagement with esports was associated with greater involvement in gambling. A review by Greer et al. (2019) recommends further research into the prevalence and impact of both esports betting and skin gambling, in order to address a range of concerns, notably: exposure of youth and adolescents, accessibility, the regulation of virtual items, the potential migration from game-related gambling to established forms of gambling, and the experience of problematic gambling behaviour.

## OUTPUT, STAGE TWO: THEMES EMERGING FROM PRESENTATIONS

### Awareness

Although loot boxes are a highly visible presence in the gaming environment, they remain a relatively novel concept to the general public; parents of video game players, and even the players themselves, may have limited information on how loot boxes function and maladapted cognitive frameworks which serve to promote misunderstanding of probabilities. An example of faulty gambling cognition is thinking that if an item has a 10% chance to appear in one loot box, purchasing 10 loot boxes guarantees receiving that item. Three out of four of presenters opined that it is of the utmost importance to increase public awareness and to develop responsible ways to offer games (including on the part of policy makers, not just industry), this is in line with prior studies (i.e. Király et al., 2021; Xiao et al., 2021). Raising awareness can help video game players better understand that which they are spending their money on and to limit their spending to affordable levels as noted by King and Delfabbro (2018) and Xiao and Henderson (2021). Furthermore, the friends and families, especially parents of video game players will benefit from increased awareness and knowledge offered, allowing them to understand the contemporary gaming environment and to prevent underaged children from developing problems with gaming. The concept of developing more meaningful relationships around gaming was specifically noted by both the expert working with problem gamers and the person with lived experience, echoing recent work (Király et al., 2021). The industry representative did not discuss about the importance of increasing awareness of loot boxes as such but instead presented an openness to collaboration with researchers, for example by sharing a data to be used.

### Loot boxes and financial problems

Loot boxes have been found to employ the same mechanics and to exploit the same psychological triggers used in gambling, which can cause an individual to spend more money than they can afford or to use money belonging to someone else. This is often the case when a child uses a parents' credit card to purchase loot boxes or skins, indeed, these purchases may be initially sanctioned by parents given that it is game content that is being purchased, as noted by both the person with lived experience and the person who was working with problem gamers. Consequently, unrestricted or unmonitored spending on loot boxes or skins may lead to notable financial problems. These issues could potentially be mitigated to some degree by working with the gaming companies, as recommended by Xiao & Henderson, 2021 and King et al., 2019. All of the participants recognized the possible transition from gaming to gambling, thus leading to financial harm, particularly the person with lived experience and the treatment provider. The legal expert (participant) highlighted the importance of stricter regulation of specific loot box types, while the industry representative called for clearer guidelines from the policy makers regarding the advertisements.

### Quickly developing field with no or little regulation

Many games have online marketplaces, for example the Steam Marketplace, which allow players to exchange the virtual items found in loot boxes, either as one-to-one trades or for real-world currencies. This has created a means by which third party gambling and auction sites can use virtual items as gambling tokens and exchange the items for real money. Indeed, research has shown that players value virtual items in the same way as physical items and, as such, that existing legislating should be amended to explicitly include virtual items in the definition of what constitutes something of value (Drummond, Sauer, Hall, et al., 2020).

Many of these third-party sites are located in countries where Finnish and EU consumer laws do not apply, with a lack of regulatory oversight meaning that skin gambling is prone to unethical and criminal activities, ranging from surreptitious advertising to outright fraud (Gainsbury, Abarbanel, & Blaszczynski, 2017b).

Three of four participants discussed the need for regulation. The legal representative provided a jurisprudential view of the Finnish Lotteries Act and loot boxes, as well-discussed in King and Delfabbro (2019) and Abarbanel (2018). The person with lived experience shared his view on preventive measures (i.e., informing the player about the odds of "winning", when opening the loot boxes and educating the parents about gaming in general). He also mentioned that advertising online is often unregulated and the perception that games are often not audited, putting the underaged at risk when gaming online. Similar issues have been raised by Kelling and Tham (2021). The industry participant called for clear guidelines and regulations from the policy makers.

### Lack of research

Any action regarding the issue must be based on research, since any regulation may compromise not only the business interests of gaming companies, but also the rights and freedoms of individuals. As the most relevant data is held within the databases of the gaming companies and is protected by

both commercial interests and the General Data Protection Regulation, new methods and standardized procedures must be established to enable effective data sharing and analysis as noted particularly by industry participant and agreed with all the other participants. Practices around the anonymizing of data should be created in collaboration with the gaming companies. Future directions for gaming-gambling convergence are identified: culturally sensitive studies are needed, qualitative studies from persons with lived experience would enhance the current knowledge and would give sound directions to quantitative studies, longitudinal studies would enhance understanding of risk and protective factors and last research should be extended to explore wider digital gambling technologies in order to achieve effective regulatory and public health measures (Kim & King, 2020) and also discussed by Gainsbury (2019) earlier.

### Identifying vulnerable target groups

Due to the lack of research, and of publicly available information, it is currently difficult to identify those video game players who might be at risk of problematic gaming and gambling habits when it comes to loot boxes. When the free-to-play model was gaining popularity in mobile games, most of the revenue came from a tiny fraction of the player base, dubbed "whales" (Alha, Koskinen, Paavilainen, Hamari, & Kinnunen, 2014), such patterns have also been observed in the purchase of loot boxes (Close et al., 2021). Concerns have been raised regarding the presence of disordered consumption behaviours among members of these high-spending players with spending on loot boxes in particular being associated with problematic consumption behaviours (Carey, Delfabbro, & King, 2021; Zendle, 2020).

There is some debate as to whether loot boxes, and other forms of video game-related gambling introduces gambling-like behaviours to a new cohort, or whether they attract those with existing problem gambling behaviours (Gainsbury, Abarbanel, & Blaszczynski, 2017a; Li et al., 2019). Given the prevalence of correlational studies, it is not currently possible to reach a definitive judgement on this issue. However, the question is an important one; identifying vulnerable target groups and the temporal relationships between loot box purchases and general gambling practices would help targeting actions and prevention strategies. Indeed, anecdotal evidence is beginning to emerge regarding individuals in treatment whose first experiences of gambling were through video games, a situation echoed by two presenters: the person with lived experience, and the person working with problem gamers. In addition to these two individuals, a third presenter, the legal expert, also expressed the opinion that identifying vulnerable groups would be an important issue to address.

### LIMITATIONS

The most notable limitations of this work derive from its explorative nature and, in particular, the nature of the data

that was gathered. First, the emergent themes detailed above were extracted from a small number, four, of invited presentations representing key stakeholders. While it is impossible to claim that the issues raised by presenters are representative of all those who operate in the same area, the fact that the speakers have several years' experience with loot boxes allows key issues to be identified. Furthermore, it is the intention of the group to continue to invite speakers in order to further develop and expand understanding of the topic. Second, as an extension of the previous point, the nature of the presentations were subjective and asked speakers to communicate personal experiences and opinions, as such they cannot be considered as statement of fact. Third, while speakers were provided with four key questions to address in their presentations, there was no set structure which they were asked to follow, such an approach was adopted in order to allow for presenters to address the issues which they themselves felt were most important. In this way it was felt the opinions of the group members would not influence the presentations, thereby allowing issues to emerge naturally. Finally, while the group compiled a series of action points to address the identified themes and areas of concern, these have not yet been enacted and we are unable to provide an assessment of their impact and effectiveness. As an extension of this point, we are similarly unable to assess the impact of the working group model itself, however, as members of the group we feel it has the potential to make a significant contribution. Accordingly, ongoing assessment and evaluation is planned both of the group itself and of its activities; for example, the membership and structure of the group will be reviewed in early 2022.

### CONCLUSION

This work presents the first year's output of an informal working group which was setup with the aim of exploring the growing use of loot boxes in digital games and what is required to minimize harms related to use of loot boxes in the Finnish context. Given that the group was newly-established, and exploratory approach was adopted in order to build knowledge of the issue, accordingly an initial two-stage approach to data gathering was agreed. First, expert members of the group each produced a report pertaining to their specialist area and which was presented to the remaining members of the group for their reference. Second, a series of guest speakers representing key stakeholders were invited to present to the group, contemporaneous notes of these presentations and accompanying materials were subjected to content analysis in order to identify key areas of concern.

Based on this preliminary exploration of loot boxes and the related issues we propose that the primary prevention requires clearer legislation and enforcement to tackle the product and provide safe, non-harmful practices, namely increasing awareness. The need for secondary prevention was also recognized, as a necessity for detection and identification of the most vulnerable groups, providing support early, this approach would also benefit from being supported by a campaign designed to educate different sectors of

society. A further action identified by the group was the potential for responsible gaming practices to be adopted, such as those used in the gambling industry, which would help to minimize the harm from overspending in gaming activities. Finally, we identified the need and opportunities for research in the field, for example the use of player data and both longitudinal and qualitative studies. These issues are not intended to form a definitive list, neither are they expected to be suited to all contexts, they are presented in order to stimulate debate and to serve as a starting point for discussions between relevant parties.

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