

Dear Dr Karhulahti and the Managing Board,

Thank you for the opportunity to submit a revised version of this stage 2 manuscript to *PCI Registered Reports*, which has now been uploaded to the Open Science Framework and is available at this link: <https://doi.org/10.31219/osf.io/hnd7w> (Version 6). I include the complete text of Dr Karhulahti's recommender comments and the three reviews by Drs Moshirnia, Macey, and Chin in *black italics*; my point-by-point responses in **purple**; and amended or newly added text in **blue and/or red for emphasis** below.

Leon Y. Xiao

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**Dr Karhulahti's Recommender Comments, 06 Nov 2022 17:11**

*Dear Leon Y. Xiao,*

*Thank you for the carefully revised manuscript. All reviewers are widely satisfied with the revisions. You will have an opportunity to address their last minor suggestions, after which I will write the recommendation. My own minor points:*

Thanks to Dr Karhulahti for his patience and expertise in processing various versions of this manuscript and handling the registered report reviewing process.

*P. 19: the Stage 1 text has been correctly moved to the first page and is no longer needed here.*

**This has been duly deleted!**

*P. 20: I still believe that presenting confidence intervals would be appropriate, at least with the main prevalence rates in Table 1 (but this remains a suggestion and is not required for recommendation).*

95% confidence intervals have been added to the percentages in Table 1 and also to the 80.0% prevalence rate calculated by excluding social/simulated casino game in Section 3.2.2.

I had to use a different software (R, version 4.2.1) to calculate these as my Stata licence has expired. Therefore, I have duly noted this at the start of the Results section setting out the software and version numbers.

I have also uploaded the relevant script and output to OSF: <https://osf.io/u768j>.

*P. 23: as the reviewers didn't express concern for social casino games, we can leave it as it is. Nonetheless, it's important to keep in mind that the exploratory outcome of 3.2.2 will not be cross-nationally comparable, e.g., with the previous studies that motivated this extra analysis (Zendle et al., 2020; cf. Zendle et al., 2022), as they negatively coded such products. This could be highlighted (again, only a suggestion).*

I agree with Dr Karhulahti's suggestion and want to avoid potentially misleading readers. Therefore, at the end of Section 3.2.2., I have added the following:

For clarity, this 80.0% prevalence rate is not comparable to the 59.0% derived from Zendle *et al.*'s UK data collected in 2019<sup>[4]</sup> because in that study simulated casino games were generally coded as not containing loot boxes<sup>[75,80]</sup>, whilst this exploratory analysis instead excluded simulated casino games.

*#732: "The Belgian Gaming Commission does recognise the randomised monetisation methods in 'simulated casino games' games as constituting 'gambling'.." This is lacking a citation. Some other parts of the discussion are also relying strongly on "general knowledge" without citation (e.g., "obvious loot box contraventions being ... highly popular" #1187). Please consider adding further references to back up such statements.*

I appreciate the points that Dr Karhulahti has raised here.

Re #732, I unfortunately do not have a citation for that legal point; I have added the following instead as this was confirmed to me in the meeting with the Belgian Gaming Commission:

The Belgian Gaming Commission **has confirmed in the same meeting with the author on 24 June 2022 that it** does recognise the randomised monetisation methods in 'simulated casino games' games as legally constituting 'gambling' (i.e., there is no distinction between the two concepts in Belgium in contrast to in most other countries where the two are treated differently in law as 'simulated casino games' are not seen as gambling and not recognised as legally constituting 'gambling' elsewhere).

Re 1187, I do not think I can find a reference for that point, although I think the data presented in the study supports my making that statement. One cannot buy anything in Belgium without a VPN/some other forms of contravention in Game 50, but it remains the 50<sup>th</sup> highest-grossing game in Belgium. I think this shows that contravention is 'highly popular.'

#751: if I understand correct, here " $p = 0.05$ " refers to the alpha level, right? If yes, please correct and/or state earlier that an alpha level 0.05 was used for all analyses (also #466 and #702).

Dr Karhulahti is correct. I have added the following to replace all references to ' $p = 0.05$ ' when discussing the alpha level at those three locations:

An alpha level of .05 was used for all statistical tests.

P. 39: Section numbers 4.8 onwards seem to be incorrect.

Indeed! This has been fixed.

*One final note -- this doesn't need a reply if deemed irrelevant, but please consider. Because it remains unclear how the Belgian ban should work or what are its goals/premises (as it was never properly implemented to begin with), some statements in the discussion like "Belgian ban on loot boxes is not working at present" (#1459) might still be better phrased. For example, the gambling monopoly of Finland is based on a specific system of ethics: money generated in gambling by Finnish companies should be directed to charity (thus only government companies are allowed provide local gambling services to ensure the rule is followed). As it remains unknown what the gambling regulation principles in Belgium are, it seems also possible that -- if they'd be based on similar local corporate control (rather than people control) -- it may also have, at least partially, succeeded if no Belgian game companies offer loot boxes? In this case, notions such as "circumventing" the ban wouldn't fully apply either (that said, the quote of Article 4(2) from 1999 seems to imply that some people control is involved). Just a thought.*

Dr Karhulahti raises a very interesting point here. I do believe none of the 100 games I examined were 'Belgian' in the sense that the developer and publisher companies were registered in and operated from Belgian. My previous experience trying to classify a game as being from a certain country (<https://doi.org/10.31219/osf.io/kjng7>) was not particularly successful as many companies were multinational and/or controlled by a company from a different country. It is difficult to therefore assess the compliance rate amongst Belgian companies. I do not think this would be possible with the dataset presented here at all. Definitely a point to explore in the future. Perhaps through interviews with Belgian companies on how they dealt with this regulatory development.

*As there will be no further review after the next final version, I can be contacted directly before submission if there is unclarity about how to respond to any of the points.*

Sincerely,  
Veli-Matti Karhulahti

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## Review 1 by Dr Andrew Moshirnia, 31 Oct 2022 12:34

*Thank you for the opportunity to review the revisions of this paper. I will take my previous comments as to the suitability of 2a-2d as read. I continue to recommend this paper.*

*In 2e, I appreciate the softening of some of the bolder language addressed in my previous comments.*

I really appreciate the time that Dr Moshirnia has taken in reviewing this project multiple times.

*I think the point at p28, ln 910 is an important one but there are some logical issues with the current conclusion that higher ranked non-compliant games are gaining users from the removal of compliant games. If, for example, Nintendo provides games 1, 2, 3 on a ranked list, and are then removed, the rank of the remaining non-compliant games would go up, but not necessarily their user numbers (Nintendo fans could simply not play). This conclusion presupposes that at least some users of compliant games would migrate to non-compliant games (I am fine with this, as it seems intuitive, but it still should be addressed and suitably qualified). I mention this because of the added language regarding crime essentially paying under the current regime -- this would need to have more support. The author does address this assumption "assuming that the amount of money spent by players on video games did not 1047 change following the ban" but that qualification should be moved up and emphasised if the point retained. This push is contradicted somewhat by the addition at 4.3, which notes that some users were likely prevented from accessing loot box content, and addressing this assumption earlier would strengthen both points.*

Thanks to Dr Moshirnia for pointing this out. I have moved up the 'assumption' text from Section 4.3. and now also additionally specifically set out the 'migration' point:

*... It is likely that some previous players of compliant games chose to 'migrate' to instead spending money on non-compliant games (although not all players would have done so). Compliant companies are making less or no revenue: assuming that the amount of money spent by players on video games did not change following the ban, the non-compliant companies have dishonestly taken a share of that revenue away from compliant companies by implementing illegal loot boxes.*

*The inclusion of "provided that 1515 reasonably strong technical measures have been implemented to prevent such 1516 circumvention. Belgium should therefore consider requiring companies and 1517 platform providers to implement sufficiently difficult-to-circumvent technical 1518 measures" forces the author to take a position as to (1) the existence of such measures and (2) their feasibility (implementation, cost, subsequent*

*countermeasures -- the eventual failure of essentially every DRM is instructive here). It might be wise to qualify the language with those concerns in mind.*

DRM in the video game context is indeed relevant here. I have qualified the language used: mostly to explain that this suggestion might not be practically achievable.

When a Belgian player seeking to actively circumvent the ban has managed to download, play, and pay for loot boxes in a video game that the company has purposefully chosen not to publish in Belgium due to the country's loot box ban, it becomes difficult to argue that the company or platform provider should still be deemed culpable in such cases, provided that reasonably strong technical measures have been implemented to prevent such circumvention. The Google Play Store, for example, only allows users to change their country settings once per year<sup>[109]</sup>, and is therefore arguably doing better at preventing potential circumvention than the Apple App Store, which places no restrictions on changing country settings (although Google is also arguably constraining consumer rights more by more strictly restricting what users can do, which governments might not wish to further encourage). Belgium should therefore consider requiring companies and platform providers to implement sufficiently difficult-to-circumvent technical measures. However, this might be difficult to enforce in practice: the IP address checks implemented by Games 50 and 78 should not be deemed as satisfactory, and it might be the case that no such technical measures are yet available or that requiring the implementation of such a measure and the active development of ways to thwart new circumventions is not economically feasible. Indeed, in a related context, digital rights management (DRM) technology for video games is used only to provide temporary intellectual property right protection against piracy during the initial sales window and is not designed to be permanently uncrackable (given that the development of which is likely impossible)<sup>[110]</sup>. The development of an impervious loot box purchase-blocking technical measure might similarly not be possible.

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**Review 2 by Dr Joseph Macey, 01 Nov 2022 14:21**

*I wish to thank the author for addressing or otherwise engaging with all the comments during what has been a very thorough review process.*

*I am satisfied that all outstanding issues have been rectified and have no further comments regarding potential amendments.*

*I believe the positionality statement is an excellent suggestion and has been well implemented.*

*I would also like to acknowledge that the author can be in something of an impossible position when attempting to compile a reference table for loot box design (see Dr. Karhulahti's comment h). While such a table would, undoubtedly be of interest and use to readers, I believe that such an undertaking would be unduly onerous given the huge range of implementations that exist (as per the example of the game "wild rift" provided by Dr. Karhulahti).*

*I am very grateful to Dr Macey for reviewing this manuscript again and for all feedback provided throughout this process.*

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**Review 3 by Dr Jason Chin, 04 Nov 2022 21:02**

*Title: Breaking Ban: Assessing the effectiveness of Belgium's gambling law regulation of loot boxes*

**Recommendation:** *Conditionally accept*

*Thank you to the author for engaging thoughtfully with the editor's and reviewers' feedback.*

*Thanks again to Dr Chin for taking the time to review this version of the manuscript.*

*My second round of feedback on the stage 2 manuscript is as follows.*

1. *While changing the grammar in the Stage 1 report is fine, I am not comfortable with the change in the protocol. Rather, I think the results should explain what was originally planned and then the response and meeting (the latter two are already done). I don't think this affects the credibility of study at all.*

*That makes sense. I have reverted the change and brought back the wording of the original registered protocol. However, I have added one sentence to the Introduction so as to not mislead potential readers (marked in read below):*

*Permission to publish the Commission's response, if any is received, was sought and, it was planned for a summary to be made available at the data deposit link (<<https://doi.org/10.17605/OSF.IO/7KJS9>>). However, departing from the registered study protocol, the Commission's response is instead described in the Results section.*

*I have then more carefully set out what transpired in the Results section per Dr Chin's suggestion:*

*In response to the author asking for the Belgian Gaming Commission to confirm whether any of the games found to contain loot boxes were duly licensed in an email dated 20 June 2022, the Commission did not provide a written response to that inquiry (and therefore none could be made available at the data deposit link as stated in the registered protocol). Instead, the Commission met with the author on 24 June 2022 and stated that this could be manually checked by the author and referred the author to public resources provided by the Belgian Gaming Commission (specifically, an exhaustive list of companies that are licensed to provide gambling services in Belgium<sup>[79]</sup>).*

2. *There is a typo in the positionality statement (autho should be author).*

Fixed. Thanks very much for spotting this!

*I always sign my reviews,*

*Jason Chin (ORCID: 0000-0002-6573-2670)*