

Opening Pandora's loot box: Weak links with gambling and player opinions on probability disclosures in China

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INTRODUCTION

Paid loot boxes are quasi-gambling monetisation methods in video games that provide the player with randomised rewards of varying in-game and, potentially, real-world value (1,2). Loot boxes are prevalent in video games internationally (3,4), and are more

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prevalent in the People's Republic of China (the PRC)¹ than in the UK (5). Loot box purchasing has been found to be positively correlated with problem gambling in 15 previous studies in Western countries, including the US (6,7), Canada (8), the UK (9,10), Germany (11), Denmark (12), and Australasia (6,13), and internationally in general (14–20). However, it is not known whether the same positive correlation can be found in non-Western countries, as cultural differences have been identified as a factor which affects gambling behaviours (21,22). Many countries are grappling with how best to regulate loot boxes, including non-Western countries, *e.g.*, Brazil (23). As the existing literature is based on 'Western Educated Industrialized Rich and Democratic (WEIRD)' samples (24), it is desirable to attempt to replicate this correlation in non-Western countries to broaden the literature and inform forthcoming regulation.

The PRC is the largest video game market in the world (25). Unlike in many Western countries, gambling is strictly prohibited by law in the PRC except for state-sponsored lotteries (26–28), and casual wagering between family and friends on entertainment activities such as card games or Mahjong (29,30). Access to and engagement with multiple forms of gambling represent a risk factor for problem gambling in Western countries (31). The correlation between loot box purchasing and problem gambling may not appear in the PRC because the lower availability of commercial gambling products may reduce gambling participation, and hence the distribution of problem gambling symptomology.

Further, the PRC is the only jurisdiction to uniquely regulate loot boxes by legally requiring video game companies to disclose the probabilities of obtaining loot box rewards as a consumer protection measure (32–34). Our previous study found that only 5.5% of games with loot boxes surveyed disclosed probabilities using the most prominent format (5). However, it is not known whether players have in fact seen these probability disclosures, and whether they believe that these disclosures have influenced their loot box purchasing behaviour. Obtaining data on these issues can inform the international debate on probability disclosures as a loot box consumer protection measure.

The following hypotheses were preregistered at <<https://osf.io/gan6k>>.

Hypothesis 1: Loot box expenditure and problem gambling will be positively correlated amongst people who have gambled in the previous 12 months.

Hypothesis 2: Loot box expenditure will be positively correlated with engagement with gambling in the previous 12 months.

Hypothesis 3: Loot box expenditure will be positively correlated with impulsiveness.

METHOD

Cross-sectional data were collected in an online survey ($N = 879$), including by being circulated through the mailing list of CDiGRA. Participants were predominantly male

¹ In this paper, the PRC refers to Mainland China and excludes the Special Administrative Regions of Hong Kong and Macau, and Taiwan, as the applicable laws in these areas are different.

(709; 80.7%), students (561; 63.8%), and young ($M_{\text{age}} = 23.0$, $SD = 5.9$). This is similar to previous studies, which recruited predominantly (~90%) males (15,18,19).

RESULTS

The hypotheses were tested via Spearman's rank correlation tests.

Hypothesis 1 was rejected: loot box expenditure and problem gambling were unrelated ($r_s(85) = .07$, $p = .259$).

Hypothesis 2 was accepted: a statistically significant correlation between loot box expenditure and engagement with gambling in the previous 12 months ($r_s(877) = .06$, $p = .030$) was found, although it was very weak.

Hypothesis 3 was accepted: a statistically significant correlation between loot box expenditure and impulsiveness ($r_s(877) = .06$, $p = .038$) was found, although it was very weak.

Overall, 362 of 428 loot box purchasers reported seeing loot box probability disclosures (84.6%). As to the perceived effects of seeing probability disclosures, of these 362 participants, only 70 (19.3%) reported buying fewer loot boxes and spending less.

DISCUSSION AND CONCLUSION

The previous literature has shown a positive correlation between loot box purchasing and problem gambling across numerous Western countries (35). In contrast, the present study found either insignificant or muted positive correlations between loot box purchasing and preregistered gambling-related constructs in the PRC. These results suggest that caution should be exercised when extrapolating Western findings on new digital markets to other jurisdictions due to cultural and other potential differences.

One possible explanation for the observed muted correlations between loot box expenditure and gambling is that the relatively traditional gambling products available in the PRC have little appeal to video game players. Lotteries are the only legal commercial gambling products and may be seen by younger video game players as outdated, unexciting, and unattractive, as the experience involves purchasing physical tickets and waiting for results. In contrast, other gambling products legally unavailable in the PRC, such as electronic gambling machines (36), or equivalent mobile phone casino games (37), are more gamified and have structural characteristics similar to loot boxes, such as ease of use, electronic delivery, and opportunities for rapid play and instant gratification. In support of this explanation, a UK study found that loot box purchasing was more strongly positively correlated with online casino games than with playing bingo or sports betting, and, importantly, was *not* correlated with lottery purchasing (38). Although the present results appear unsupportive of the loot box purchasing and problem gambling literature (cf. 35), they could perhaps motivate deeper investigation of this correlation towards the refinement of a more nuanced psychological explanation, *i.e.*, that loot box purchasing is correlated with engagement with and problematic use of specific types of gambling that are gamified and electronic, rather than all types of gambling.

As to probability disclosures, importantly, only 19.3% of loot box purchasers who saw disclosures reported buying fewer loot boxes as a consequence. Stronger interventions, such as maximum spending limits and increasing the probabilities of winning rare rewards and reducing the total number of potential rewards (39), may be needed to

effectively reduce potential harms from loot box purchasing. A greater number of customisable and flexible ‘ethical game design’ interventions exist given that loot boxes are purely digital products, in comparison to what is possible in gambling (32,39,40).

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