Risk Factors For Loot Box Engagement in U.S. College Students

Cassandra Grinstead, MS
Oregon State University
2950 SW Jefferson Way
Corvallis, Oregon USA 97330
Cassandra.grinstead@oregonstate.edu

David C. R. Kerr, PhD, Connor Punsalan, BS, Jaedyn Antle, BS
Oregon State University
2950 SW Jefferson Way
Corvallis, Oregon USA 97330
david.kerr@oregonstate.edu

Keywords
Risk factors, loot box, depression, impulsivity, college students

INTRODUCTION

Loot boxes are a form of monetization in video games that are frequently associated with problem gambling and problem gaming (Garea et al. 2021; Yokomitsu et al. 2021). Therefore, identifying both unique risk factors for loot box purchasing, and shared risk factors with gambling and gaming will be beneficial to prevention efforts. However, there is limited research on risk factors for loot box purchasing in the U.S. among college students, with studies focusing on non-student adults or adolescents (King et al. 2020; DeCamp et al., 2021). Throughout the literature several risk factors have been identified across different populations. Psychological distress, loneliness, risk taking, and impulsivity have positive associations with loot box purchasing (Drummond et al. 2022a; Sirola et al. 2023, Garrett et al. 2023; Wardle & Zendle, 2021). A single study examined resilience as it relates to loot box purchasing (Sirola et al. 2023). These demonstrate the need for further research examining risk and protective factors further.

Objectives. This study measured five unique risk and protective factors for risky loot box purchasing for college students: impulsivity, risk-taking, depressive symptoms, loneliness, and resilience. These five risk factors were tested after accounting for other risky behaviors including problem gaming, problem gambling, and alcohol use disorder symptoms. This study also conducted exploratory analyses on whether the effect of these risk factors on risky loot box purchasing was moderated by gender.

Methods. College students (n = 251) in the United States completed an in-person survey and laboratory risk-taking task. The risk and protective factors were measured using the Participant Health Questionnaire-8 (PHQ-8; Kroenke et al., 2001), UCLA Three Item Loneliness Scale (TILS: Hughes et al. 2004), Short UPPS-P Impulsive Behavior Scale (UPPS-P; Cyders et al. 2014), Connor-Davidson Resilience Scale (CD-RISC; Connor and Davidson 2003), and the Balloon Analog Risk Task (BART; Lejuez et al. 2002). The primary outcome variable was risky loot box engagement, as measured by the Risky Loot Box Index (RLI; Brooks and Clark 2019). Three other scales measured risky behavior: the Internet Gaming Disorder

Proceedings of The Gam(bl)ing Conference 2026

Short Form (IGD; Pontes and Griffiths 2015), Problem Gaming Severity Index (PGSI; Holtgraves 2009), and Alcohol Use Disorder Identification Test (AUDIT; Saunders et al. 1993). Participants also answered questions related to demographics, finances, and gaming habits. Finally, to inform future studies, descriptive data were collected on when, where, and how much participants spent on loot boxes.

Analytic plan. Linear regressions were conducted to test the effect of each risk factor after adjusting for age and gender. If a risk factor was a significant predictor, it was then tested again after accounting for other risky behaviors including problem alcohol use, problem gambling, and internet gaming disorder symptoms. Exploratory analyses were conducted to examine gender as a moderator for significant predictors.

Participant Characteristics and Gaming History. Most of the sample was white (65.3%, n = 164) and cis-gender male (58.9%, n = 148). The sample was primarily made up of first-year college students (M = 19.4 years-old, SD = 1.43). They either received psychology course research credit (80%, n = 201) or were paid $20 (20%, n = 48). The majority of participants reported spending $0/month (36.6%, n = 92), or less than $10/month (31.8%, n = 80) on loot boxes. Participants also reported which games they had purchased the most loot boxes from, common answers included *Fortnite* (Epic Games, 2017), *Overwatch* (Blizzard Entertainment, 2016), *Roblox* (Roblox Corporation, 2006), and *Apex Legends* (Respawn Entertainment, 2019). Most participants stated that the first time they purchased a loot box was before (55.7%, n = 140) or during high school (33.4%, n = 84) whereas few (3.5%, n = 9) did so after high school. The most frequently played genre of the last 12-months was "Action" (n = 155, 61.2% reported they play "Often").

Results. All five risk factors were tested using separate linear models. In the primary models, depression symptoms (β = .193, p = 0.003) and impulsivity (β = .163, p = .02) were significant predictors of risky loot box engagement. However, neither was significant after accounting for other risky behaviors. Loneliness, risk-taking, and resilience were not significant predictors. Additional Pearson's correlations showed that risky loot box purchasing was associated with problem gaming (r = .40, p < .001) and problem gambling (r = .24, p < .001). Exploratory analyses did not support interactions between gender and either depressive symptoms or impulsivity on risky loot box engagement.

Conclusion. This study found evidence of two risk factors for risky loot box engagement: depression symptoms and impulsivity. Neither uniquely predicted loot box engagement beyond associations shared with related problem outcomes, such as problem gaming. Future research should investigate potential social risk and protective factors such as specific game genres and social reasons for loot box purchasing.

BIBLIOGRAPHY

Blizzard Entertainment. 2016. *Overwatch*. PC/PlayStation/Xbox/Nintendo Switch, current version. Irvine, CA, USA: Blizzard Entertainment.

Brooks, Gabriel A., and Luke Clark. 2019. "Associations between Loot Box Use, Problematic Gaming and Gambling, and Gambling-Related Cognitions." *Addictive Behaviors* 96 (September): 26–34. https://doi.org/10.1016/j.addbeh.2019.04.009.

Connor, Kathryn M., and Jonathan R. T. Davidson. 2003. "Development of a New Resilience Scale: The Connor-Davidson Resilience Scale (CD-RISC)." *Depression and Anxiety* 18 (2): 76–82. https://doi.org/10.1002/da.10113.

Cyders, Melissa A., Andrew K. Littlefield, Scott Coffey, and Kenny A. Karyadi. 2014. “Examination of a Short English Version of the UPPS-P Impulsive Behavior Scale.” *Addictive Behaviors* 39 (9): 1372–76. https://doi.org/10.1016/j.addbeh.2014.02.013.

DeCamp, Whitney. 2021. “Loot Boxes and Gambling: Similarities and Dissimilarities in Risk and Protective Factors.” *Journal of Gambling Studies* 37 (1): 189–201. https://doi.org/10.1007/s10899-020-09957-y.

Drummond, A., Hall, L. C., & Sauer, J. D. (2022a). Surprisingly high prevalence rates of severe psychological distress among consumers who purchase loot boxes in video games. *Scientific Reports*, *12*(1), 16128. https://doi.org/10.1038/s41598-022-20549-1

Epic Games. 2017. *Fortnite*. PC/PlayStation/Xbox/Nintendo Switch, current version. Cary, NC, USA: Epic Games.

Garea, Shaun Stephen, Aaron Drummond, James D. Sauer, Lauren C. Hall, and Matthew Neil Williams. 2021. “Meta-Analysis of the Relationship between Problem Gambling, Excessive Gaming and Loot Box Spending.” *International Gambling Studies* 21 (3): 460–79. https://doi.org/10.1080/14459795.2021.1914705.

Garrett, E. P., Drummond, A., Lowe-Calverley, E., De Salas, K., Lewis, I., & Sauer, J. D. (2023). Impulsivity and loot box engagement. *Telematics and Informatics*, *78*, 101952. https://doi.org/10.1016/j.tele.2023.101952

Holtgraves, Thomas. 2009. “Evaluating the Problem Gambling Severity Index.” *Journal of Gambling Studies* 25 (1): 105–20. https://doi.org/10.1007/s10899-008-9107-7.

Hughes, Mary Elizabeth, Linda J. Waite, Louise C. Hawkley, and John T. Cacioppo. 2004. “A Short Scale for Measuring Loneliness in Large Surveys: Results From Two Population-Based Studies.” *Research on Aging* 26 (6): 655–72. https://doi.org/10.1177/0164027504268574.

King, A., Wong-Padoongpatt, G., Barrita, A., Phung, D. T., & Tong, T. (2020). Risk Factors of Problem Gaming and Gambling in US Emerging Adult Non-Students: The Role of Loot Boxes, Microtransactions, and Risk-Taking. *Issues in Mental Health Nursing*, *41*(12), 1063–1075. https://doi.org/10.1080/01612840.2020.1803461

Kroenke, Kurt, Robert L. Spitzer, and Janet B. W. Williams. 2001. “The PHQ-9: Validity of a Brief Depression Severity Measure.” *Journal of General Internal Medicine* 16 (9): 606–13. https://doi.org/10.1046/j.1525-1497.2001.016009606.x.

Lejuez, C. W., Jennifer P. Read, Christopher W. Kahler, et al. 2002. “Evaluation of a Behavioral Measure of Risk Taking: The Balloon Analogue Risk Task (BART).” *Journal of Experimental Psychology: Applied* 8 (2): 75–84. https://doi.org/10.1037/1076-898X.8.2.75.

Pontes, Halley M., and Mark D. Griffiths. 2015. “Measuring DSM-5 Internet Gaming Disorder: Development and Validation of a Short Psychometric Scale.”

Computers in Human Behavior 45 (April): 137–43. https://doi.org/10.1016/j.chb.2014.12.006.

Respawn Entertainment. 2019. *Apex Legends*. PC/PlayStation/Xbox/Nintendo Switch, current version. Redwood City, CA, USA: Electronic Arts.

Roblox Corporation. 2006. *Roblox*. PC/Mac/iOS/Android/Xbox, current version. San Mateo, CA, USA: Roblox Corporation.

Saunders, J. B., O. G. Aasland, T. F. Babor, J. R. de la Fuente, and M. Grant. 1993. "Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption II." *Addiction*, no. 88: 791–804.

Sirola, A., Nyrhinen, J., Nuckols, J., & Wilska, T.-A. (2023). Loot box purchasing and indebtedness: The role of psychosocial factors and problem gambling. *Addictive Behaviors Reports*, *18*, 100516. https://doi.org/10.1016/j.abrep.2023.100516

Wardle, H., & Zendle, D. (2021). Loot Boxes, Gambling, and Problem Gambling Among Young People: Results from a Cross-Sectional Online Survey. *Cyberpsychology, Behavior, and Social Networking*, *24*(4), 267–274. https://doi.org/10.1089/cyber.2020.0299

Yokomitsu, Kengo, Tomonari Irie, Hiroki Shinkawa, and Masanori Tanaka. 2021. "Characteristics of Gamers Who Purchase Loot Box: A Systematic Literature Review." *Current Addiction Reports* 8 (4): 481–93. https://doi.org/10.1007/s40429-021-00386-4.

Zendle, D., Meyer, R., & Over, H. (2019). Adolescents and loot boxes: Links with problem gambling and motivations for purchase. *Royal Society Open Science*, *6*(6), 190049. https://doi.org/10.1098/rsos.190049

BIO

Cassandra Grinstead is a 3rd year clinical psychology graduate student at Oregon State University. She works with Dr. David Kerr in the Youth Adjustment Lab, where she conducts research on various addictions in emerging adults and youth. She completed her master's thesis investigating risk factors for loot box purchasing among young adults, and continues to investigate the intersection of substances, video games, and gambling.

David C. R. Kerr is a professor in the School of Psychological Science at Oregon State University. His primary research projects include the public health effects of state cannabis and alcohol policies for adolescents and young adults. He has ongoing interests in family influences on adolescent substance use, depression, and suicide risk, with a special interest in longitudinal designs.

Connor Punsalan graduated from Oregon State University with a B.S. in Psychology and minors in Human Development and Family Services and Organizational Leadership. He works in the Youth Adjustment Lab as a research assistant under the direction of Dr. Kerr at OSU. He plans to pursue a PsyD in Clinical Psychology with a focus on mental health treatment and assessment among children with disabilities.

Jaedyn Antle graduated from Oregon State University with a B.S. in Psychology and a minor in Education. At OSU, he works as a research assistant in the Youth Adjustment Lab with Dr. Kerr and the ACTUAL Lab with Dr. Christopher Sanchez. He plans to pursue a PhD in psychology with research interests in substance use, psychopharmacology, and the role of education in shaping how we understand both.

FUNDING

This research was funded by a grant from the Oregon Gambling Research Center. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Oregon Council on Problem Gambling.

CONFLICTS OF INTEREST

The authors do not have any conflicts of interest to disclose.