

Digital resilience, health, and harms, with the digital convergence

Sarah Hodge

Bath Spa University
Newton Park,
Bath, BA2 9BN
s.hodge@bathspa.ac.uk

Keywords

digital resilience, digital harms, digital health, convergence of technology, gambling, gaming, addiction

INTRODUCTION

Loot boxes have appeared in various forms in video games and have built on historical mechanics and features (Hodge, 2022; Nielson & Grabarczyk, 2019). They have arguably been part of the ‘gamblification’ of games (Brock, & Johnson, 2021). The expansion of loot box research helped lay the foundations for building scientific knowledge, awareness, and regulation to support users. One result is the PEGI label for in-game spending (e.g., Drummond, et al., 2020; Xiao, 2023; PEGI, 2026) but more research needs to go beyond loot boxes, to explore the continuing convergence (Brock, & Johnson, 2021) between technology and activities, that were previously separate, overlapping and combining (e.g., Zhang, & Zhang, 2025). While this convergence can lead to innovation (Zhang, & Zhang, 2025), considerations are needed, particularly for the user: digital resilience, health, and harms.

Digital convergence can be seen with social media, gaming, and gambling (Gainsbury et al., 2014). Technology is enabling further convergence, and this convergence will continue with future technological advancements (Brock, & Johnson, 2021; Zendle, & Bowden-Jones, 2019). Examples of further and continued digital convergence, which needs more research include, gaming and gambling features in online dating and shopping applications, gaming social media content creators/influencers promoting gambling/gambling-like game features. Currently, much of the research is divided by technology device or activity, for example the addiction literature (Yu, & Sussman, 2020). This abstract aims to highlight theoretical considerations for the user in the context of digital resilience, health, and harms from previous research and how these are informing current and future research in light of the increasing digital convergence.

Previous research with lived experience participants of gaming and gambling harms have highlighted how the convergence can be particularly problematic when recovering from gambling addiction (Davidson et al., 2024). Participants reported how some of the video game features in online games such as buying power ups exasperated some of the challenges they faced with gambling related harms as well as technology enabling access to gambling 24/7 (Davidson et al., 2024). This highlights how if someone has had difficulties and harms these may easily transfer to other aspects of technology use, and how the convergence can exacerbate this. Therefore, looking at technology uses a whole could highlight how harms and challenges may manifest. For example, if spending is a challenge to a user, and they have experienced gambling-related harm, they may also experience challenges with in-game/app spending (this may be broader than just loot boxes and gaming and include shopping and dating applications etc.).

One approach could be a boarder continuum of digital addiction that could established/highlight the complexities of digital behavior particularly in light of the continuing convergence (Hodge 2026; Yu, & Sussman, 2020). Support for this approach can be suggested from shared underpinning features of behavioral addiction (Griffiths, 1995). As gambling addiction is recognized and could be used to aid in supporting, mapping and understanding other digital harms (Davidson et al., 2024; Hodge, 2026), especially due to suggested harms overlapping for example, preoccupation and narrow focus with the activity (Hodge, 2026).

Another aspect to a border approach is digital resilience, which could help acknowledge and encompass technology usage and understanding the role of harms, health and well-being for the user and those networks around the user (such as family members, and health professionals) (Bronfenbrenner 2005; Hodge, 2026; Hodge & Johnson, 2020). The two key aspects of how this approach can support are: 1) help mitigate for the nuances of technology and the convergence; and 2) provide a holistic structure for recognizing health and harms to support users. Digital resilience builds on the awareness and critical evaluative elements of digital/media literacy (e.g., Potter, 2022) but incorporates user/behavioral elements such as the potential challenges and consideration to health and harms. The digital resilience approach can be argued to be particularly helpful, when there is not a clear consensus with on-going debate in the literature on the role of digital addiction (e.g., Yu, and Sussman, 2020; Hodge, 2026). Especially the role of comorbidity with other addiction/harms (e.g., Estévez, et al., 2020), a boarder approach to the potential transference of technology harms could be better mitigated and supported.

Hence, the harms and health approach through digital resilience can be arguably more pragmatic and recognize impacts, which is particularly useful for those who work in healthcare services and educational institutions and have reported to be encountering technology-related harms (e.g., Davidson et al., 2024; Hodge, 2026; Ventouris, Panourgia, & Hodge, 2021). Moreover, the approach could support training (e.g., YGAM, 2026).

It is also acknowledged that while digital resilience is an approach to support understanding harms and health. It does not detract from the need for more and user support from systems/platforms (e.g., Drummond, et al., 2020; Xiao, 2021). Rather digital resilience can support the conceptual framing and approach with the ongoing convergence as well as how this may translate to support users experiencing harms and challenges.

In summary, this abstract discusses theoretical considerations of digital resilience as an approach to help address health and harms considerations from the continuing convergence of technology. Research and regulations in gambling can help map and understand other digital harms, and considerations for a boarder approach of digital health, harms and potentially addiction. Particularly, the application of harms and health to support the user and various stakeholders who may be supporting users, through identification and training of digital harms.

BIO

Sarah Hodge is a cyberpsychology and Human-Computer-Interaction researcher with a focus on gaming and gambling. Through exploring the interplay between human factors and game design. Including game features/design, decision making, morality, transparency, digital convergence, demographic factors, experiences, digital addiction/engagement, and nostalgia. She utilizes technology-driven methods and working with interdisciplinary teams of academics, industry partners/businesses, game developers and designers, to create purpose-made and VR games for research and education. Such work has enabled her to explore how to psychologically support users, develop training and education, specifically focusing on the concepts of digital resilience and children and young people's technology use.

FUNDING

No funding for this research.

CONFLICTS OF INTEREST

Match funded PhD and MRES studentships and research bidding, previously received research funding from GambleAware and an industry gambling software supplier, Playtech.

ENDNOTES

N/a

BIBLIOGRAPHY

- Brock, T. & Johnson, M. 2021. The gamblification of digital games. *Journal of Consumer Culture*, 1469540521993904. <https://doi.org/10.1177/1469540521993904>
- Bronfenbrenner, U. 2005. *Making human beings human: Bioecological perspectives on human development*. Sage Publications.
- Davidson, K. Hodge, S. E. Panourgia, K. Hutchings, M. & Clelland, K. 2024. Lived experiences of gaming and gambling related harm and implications for healthcare services. *Journal of Gambling Issues*. <http://doi.org/10.4309/OOFV5795>
- Drummond, A. Sauer, J. D. Hall, L. C. Zendle, D. & Loudon, M. R. 2020. Why loot boxes could be regulated as gambling. *Nature human behaviour*, 4(10), 986-988. <https://doi.org/10.1038/s41562-020-0900-3>
- Estévez, A., Jáuregui, P. Lopez-Gonzalez, H. Macia, L. Granero, R., Mestre-Bach, G. Fernández-Aranda, F. Gómez-Peña, M. Moragas, L. Mena-Moreno, T. Lozano-Madrid, M. Del Pino-Gutierrez, A. Codina, E., Testa, G. Vintró-Alcaraz, C. Agüera, Z. Munguía, L. Baenas, I. Valenciano-Mendoza, E. Mora-Maltas, B. Menchón, J. M. & Jiménez-Murcia, S. 2021. Comorbid behavioral and substance-related addictions in young population with and without gambling disorder. *International Gambling Studies*, 21(1), 133–152. <https://doi.org/10.1080/14459795.2020.1836250>
- Gainsbury, S. M. Hing, N. Delfabbro, P. H. & King, D. L. 2014. A taxonomy of gambling and casino games via social media and online technologies. *International Gambling Studies*, 14(2), 196–213. <https://doi.org/10.1080/14459795.2014.890634>

-
- Griffiths, M. D. 1995. Technological addictions. *Clinical Psychology Forum*, 76, 14–19.
- Hodge, S. E. 2026. 'Digital resilience: reflections and considerations for students' technology use.' In: Phippen, A and Bond, E, eds. *The digital student: challenges for universities in a post COVID world and how to address them*. Chandos Publishing, pp. 65-88.
- Hodge S, and Johnson, L. 2020. *The digitally resilient student*. *The Psychologist*. <https://thepsychologist.bps.org.uk/digitally-resilient-student>
- Hodge, S. E., Vykoukal, M., McAlaney, J. Bush-Evans, R. D. Wang, R. & Ali, R. 2022. What's in the box? Exploring UK players' experiences of loot boxes in games; the conceptualisation and parallels with gambling. *Plos one*, 17(2), e0263567. <https://doi.org/10.1371/journal.pone.0263567>
- Nielsen, R. K. L., & Grabarczyk, P. 2019. Are Loot Boxes Gambling?: Random reward mechanisms in video games. *Transactions of the Digital Games Research Association*, 4, 171-207.
- Pan European Game information 2026. *What do the labels mean?* Pan European Game information (PEGI). <https://pegi.info>
- Potter, W. J. 2022. Analysis of definitions of media literacy. *Journal of Media Literacy Education*, 14(2), pp.27-43. <https://doi.org/10.23860/JMLE-2022-14-2-3>
- Ventouris, A, Panourgia, C and Hodge, S. E. 2021. 'Teachers' perceptions of the impact of technology on children and young people's emotions and behaviours.' *International Journal of Educational Research Open*, 2. e100081. <https://doi.org/10.1016/j.ijedro.2021.100081>
- Xiao, L. Y. 2021. Regulating loot boxes as gambling? Towards a combined legal and self-regulatory consumer protection approach. *Interactive Entertainment Law Review*, 4(1), 27-47. <https://doi.org/10.4337/ielr.2021.01.02>
- Xiao, L. Y. 2023. Beneath the label: unsatisfactory compliance with ESRB, PEGI, and IARC industry self-regulation requiring loot box presence warning labels by video game companies. *Royal Society Open Science*, 10(3), Article 230270. <https://doi.org/10.1098/rsos.230270>
- Young Gamers and Gamblers Education Trust, YGAM. 2026. *Training*. <https://ygam.org/book-training/>
- Yu, S. & Sussman, S. 2020. Does smartphone addiction fall on a continuum of addictive behaviors?. *International journal of environmental research and public health*, 17(2), 422. <https://doi.org/10.3390/ijerph17020422>
- Zendle, D. & Bowden-Jones, H. 2019. Loot boxes and the convergence of video games and gambling. *The Lancet Psychiatry*, 6(9), 724-725. [https://doi.org/10.1016/S2215-0366\(19\)30285-8](https://doi.org/10.1016/S2215-0366(19)30285-8)

Zhang, Z. and Zhang, Q. 2025. Bridging the digital and green divide: technology convergence and productivity in innovative manufacturing. *Journal of Innovation & Knowledge*, 10(6), p.100848.
<https://doi.org/10.1016/j.jik.2025.100848>