1828
AKADÉMIAI KIADÓ

Journal of Behavioral Addictions

DOI:
10.1556/2006.2025.00339

COMMENTARY

SHARP-G-R: A revised tool for assessing the addictive potential of video games

Commentary on Saini et al. (2024) Development of the Saini-Hodgins Addiction Risk Potential of Games (SHARP-G) Scale: An International Delphi study

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Received: August 3, 2025 • Revised manuscript received: May 18, 2026 • Accepted: June 3, 2026

ABSTRACT

The Saini-Hodgins Addiction Risk Potential of Games (SHARP-G) is a recently developed instrument designed to assess the addictive potential of video games based on their structural characteristics. While the novel instrument is highly valuable, its applicability may pose several challenges. In this work, we introduce the SHARP-G-R, a revised version featuring modifications of selected items and an overall simplification of language to improve clarity and accessibility. This updated iteration enhances the interpretability of the items, removes those with limited empirical support, and introduces new items that capture additional relevant features that may contribute to the addictive potential of games. The commentary outlines all modifications made and provides a detailed rationale for each of them. By refining the instrument, the authors aim to contribute to the discourse on the role of game design in the development and maintenance of gaming-related harms, highlighting the ethical responsibilities of the gaming industry in fostering safer gaming environments.

KEYWORDS

gaming disorder, video games, structural characteristics, addictive potential, safety by design

BACKGROUND

The emergence, progression, and persistence of gaming disorder (GD) arise from the interplay of gaming-related, individual, and environmental factors. Contrary to what is sometimes assumed, a single factor is not sufficient to cause a disordered state; rather, it is the combined and interactive influence of multiple factors (Brand et al., 2025; Király, Koncz, Griffiths, & Demetrovics, 2023). Besides personal and contextual factors, video game characteristics were suggested to play a key role in the development of problematic use (King, Melzer, & Consortium, 2018). There is a growing concern that video games are increasingly incorporating manipulative design practices and predatory monetization techniques that exploit psychological vulnerabilities (King & Delfabbro, 2018; Petrovskaya & Zendle, 2022).

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Researchers have been arguing that gaming companies should minimize these by following the 'safety by design' principle and committing to player protection and harm reduction. This principle is aligned with the public health approach and suggests that responsibility should lie with gaming companies to cause less harm, rather than with the users to protect themselves from it (Griffiths & Pontes, 2020). In other words, ethical game design should be implemented to promote fair and transparent player experiences, thereby reducing compulsive tendencies that contribute to problematic gaming.

A fundamental step towards the 'safety by design' principle is identifying those design elements, gaming features, and mechanics that increase the addictive potential of video games. In recent years, systematic reviews were conducted on this topic (e.g., Rehbein, King, Staudt, Hayer, & Rumpf, 2021; Saini & Hodgins, 2023), contributing to the parallel development of two structured assessment instruments, namely the Saini-Hodgins Addiction Risk Potential of Games (SHARP-G; Saini et al., 2024) and the Risk Characteristics Checklist for Games (RCCG; Rehbein, Gentile, Lemmens, & Rumpf, 2024) by two independent research groups aiming to assess the addictive potential of video games based on their intrinsic structural characteristics.

The SHARP-G scale (Saini et al., 2024) was developed through an international Delphi study, involving a panel of experts including researchers, clinicians, and individuals with lived experience who indicated problems with gaming in the previous 12 months. The Delphi method is a systematic consensus-building methodology used to transform the subjective opinions of experts into a reliable group consensus through iterative rounds of surveys. In the present study, a set of video game features associated with addiction risk – initially identified through a comprehensive literature review (Saini & Hodgins, 2023) – was evaluated by the aforementioned panel of experts over two iterative rounds. The panel comprised 40 members (10 researchers, 8 clinicians and 22 gamers) in the first round and 26 members (7 researchers, 8 clinicians and 11 gamers) in the second, demonstrating a 50% attrition rate among gamers, contrasted with zero attrition among clinicians. Through expert feedback and statistical agreement, 25 structural features were identified, which were subsequently distilled into a 23-item scale. The final SHARP-G framework categorizes these features into five domains: Social Features, Gambling-Like Features, Personal Investment, Accessibility, and World Design.

The RCCG (Rehbein et al., 2024) is a standardized instrument developed over a ten-year period to identify structural game features that may increase the risk of gaming disorder in vulnerable individuals. Its development process began with qualitative content analyses of massively multiplayer role-playing games and later expanded into a cross-genre taxonomy derived from 'thinking aloud' sessions with gamers playing titles from nine different genres. To confirm the empirical relevance of the identified features, a large-scale pilot study was conducted, which identified mandatory social interactions and reward system complexity as primary predictors of problematic gaming. The RCCG provides both a general risk assessment and age recommendations. Regarding its applicability, the authors state that its competent application requires at least four h of specialized training.

Recognizing the potential of these instruments, the first author incorporated them into a series of academic "Research Field Practice" courses starting from 2024 autumn, during which psychology undergraduate students assessed the addictive potential of their preferred video games with both instruments. This practice provided an opportunity for in-depth discussions of the applicability of the instruments, generating numerous questions, observations, and suggestions for refinement. Following the first two semesters of these courses, six undergraduate students (co-authors of the present paper) conducted their thesis study in this topic under the supervision of the first author. In a quantitative survey study, we aimed to compare professional ratings of specific games with ratings of gamers of the respective games to examine the reliability of the instrument (Király et al., 2025). In designing this study, we decided to use the SHARP-G because of its much simpler usability compared to the RCCG. To make the instrument suitable for an online survey, we aimed to adapt the items into a self-report questionnaire format. However, during this process, we realized that a more thorough revision could further improve the instrument. Therefore, we decided to systematically revise the instrument item by item before applying it in the thesis study.

In the present work, we aim to provide detailed feedback on the SHARP-G and its items, suggest areas for improvement, and propose a revised version, namely the SHARP-G-R.

METHODS

The systematic, item-by-item revision process took place during a series of regular meetings in the first months of 2025 and comprised comprehensive informal discussions between the first author, the last author, and the six undergraduate students. Two of the students are 'gamers' with a broad range of knowledge across different game genres, two are highly familiar with Counter-Strike and other shooter games, and two are casual players. The first author has a general familiarity with video games, having conducted research in this field for 15 years, while the last author is also a 'gamer' with broad knowledge of games and a deep understanding of game mechanics.

Each item was systematically evaluated. We agreed on numerous SHARP-G items, which were adapted into the self-report format after brief discussions. Other items generated thorough and long discussions—sometimes lasting two to four h—in cases where it was difficult to find a solution and phrasing with which everyone agreed. After all items were thoroughly discussed and the SHARP-G-R was created, we asked eight gamers (acquaintances of the students) to provide feedback on all items using open-ended

text boxes in an online pilot survey. Based on this feedback, we further refined the items to create the present version. Moreover, the SHARP-G-R was utilized and discussed across three additional academic semesters within 'Research Field Practice' courses (spring & autumn semesters, 2025; spring semester, 2026), where feedback from students familiar with video games was also obtained and further refinements took place. However, the present version still needs comprehensive empirical evaluation and validation, as well as continuous updates to keep up with the constantly changing gaming environment.

REVISION OF THE SHARP-G

In the revised version, most items were retained with minor linguistic modifications, others were merged or substantially revised for conceptual clarity, two were removed, and four new items were introduced. The following sections provide a detailed overview of these modifications. Furthermore, items of the SHARP-G scale paired with the items of the revised scale (SHARP-G-R) can be seen in Figure S1 among the online supplementary materials.

Simplification of items

The majority of the items were linguistically simplified to enhance clarity, ensuring easy interpretability by both academic and non-academic audiences. For instance, "*The game appears to display negligible or no discernible near miss elements.*" was simplified to "*The game has no near win elements/events.*" (Note: the term 'near miss' was replaced by 'near win', see our comments on this later). The explanation "*Engaging provides unique stat advantages allowing the player to the pre-set difficulty of a level that would otherwise not be possible.*" was rephrased to "*gain advantages that help the players progress*". Additionally, explanations and, where relevant, examples were incorporated into all response options (e.g., low, moderate, high) to improve comprehension and facilitate more objective and consistent responses. The items that were selected to be simplified are listed below, with their exact phrasing provided in the Appendix. The corresponding SHARP-G-R item numbers are indicated in brackets.

- PERSONAL INVESTMENT
  - *(Time) Repeated Login* (item 1)
  - *(Time) No Endpoint* (item 3)
  - *(Financial) In-Game Purchases and/or Micro Purchases* (item 5)
- ACCESSIBILITY
  - *Financial Game Accessibility* (item 8): While gamers may be familiar with the average market price of games, it is not entirely clear to what game/games this average market price refers to in the SHARP-G instrument. Moreover, the ≥50% and ≤50% implies a calculation that may increase the chance of incorrect responses. Therefore, we propose specifying exact amounts to ease responding and avoid subjective interpretations. Considering that, at the time of writing this article, a full-price video game costs approximately 70 euros/dollars, we propose the following response options: (i) Expensive (36 euros/dollars or more) and/or subscription models, (ii) Cheap (between 1 and 35 euros/dollars), (iii) Free. However, these amounts should be consistently verified and, if required, updated each time the instrument is employed.
- GAMBLING-LIKE FEATURES
  - *Near Miss* (item 9): We propose using the term 'near win' instead of 'near miss' because, in colloquial terms, it better describes the essence of near miss events. Near-miss events often involve outcomes that appear very close to a jackpot or desired win (e.g., two matching symbols and a third just slightly off on a slot machine). Calling these 'near wins' highlights their alignment with success rather than failure, which resonates more with the player's perception of having almost achieved victory.
  - *Loot Boxes* (item 11)
  - *In-Game Gambling* (item 12): We propose excluding loot boxes from this question to avoid the overlap with item 11 specifically asking about loot boxes. Furthermore, we propose changing the order of these two items, so that the definition of loot boxes comes at the first appearance of the term.
  - *Collectibles* (item 16)
- SOCIAL
  - *Guilds* (item 20)
  - *User-to-User Interactivity* (item 21)
  - *Leaderboard* (item 22)
- WORLD DESIGN
  - *Experience-Oriented World* (item 23)
  - *Grinding* (item 24)

Revision of items and answer options

Two items, namely *(Time) Game Extenders* from the PERSONAL INVESTMENT category and '*Meta-Game Rewards*' from the GAMBLING-LIKE FEATURES category, were merged. The reason for this decision was that downloadable contents (DLCs) alone do not appear to significantly increase a game's addictive potential. As proposed in the SHARP-G, DLCs usually include content for levels, stories, and quests, which provide an extended gameplay beyond what was offered in the initial version of the game, leading to more hours spent gaming. Although a moderate association between gaming time and problematic gaming has been proposed (Ropovik et al., 2023), we argue that having more content alone does not directly translate to a higher addictive potential, as highly engaged gamers who play for substantial amounts of time do not necessarily experience any gaming disorder symptoms or psychological distress (Katz et al., 2024; Király, Tóth, Urbán, Demetrovics, & Maraz, 2017). Therefore, we aim to emphasize

supplementary activities and progression systems (as proposed in the 'Meta-Game Rewards' item) – such as mini-games, challenges, extra achievements, or similar add-ons – that not only extend gameplay beyond the core experience but also provide powerful rewards to encourage prolonged participation even when players might have otherwise discontinued playing; thus shifting emphasis from the amount of time spent per se to the difficulty to stop playing. For the exact phrasing, see item 15 in the Appendix.

Some items, and particularly their response options, were revised content-wise to better reflect the addictive potential of video games.

- PERSONAL INVESTMENT
  - *(Time) Event Duration* (item 2): While some genres, such as massively multiplayer online role-playing games (MMORPGs), include lengthy activities without potential exit points (e.g., long quests, raids) that extend gaming time and engagement, popular match-based games (e.g., Battle Royale games like Fortnite and Multiplayer Online Battle Arenas like League of Legends and Brawl Stars) also promote prolonged gaming sessions (playing in one sitting), despite their shorter match durations. Match-based games are usually designed to encourage players to jump into the next round right after a match ends. Recent studies have shown that such game genres are associated with problematic gaming (King et al., 2019; Király et al., 2023). Therefore, we emphasize how strongly the game compels players to continue playing for extended periods in one sitting, even if they wish to stop. In this way, match-based games with short event duration (i.e., matches lasting for less than 10 min) may also get a high score, which better reflects their high addictive potential supported by their association with problematic gaming. For the exact phrasing of the item, see the Appendix.
- ACCESSIBILITY
  - *Physical Game Accessibility* (item 7): We suggest reducing and modifying the response options to two (no and yes; rated with 0 and 2 points – see our argumentation on the scoring later) because the second option seemed difficult to interpret. We also moved the explanations from the question to the response options to ease the respondents' decision-making. For the exact phrasing of the item, see the Appendix. The revised item differentiates between games restricted to stationary devices (personal computers/consoles) and those available on portable devices (smartphones/tablets), which offer greater accessibility.
- GAMBLING-LIKE FEATURES
  - *Immediacy of Rewards*: In our view, the response options ((1) Extended Time or N/A > 24 h; (2) Moderate Time 1–24 h; (3) Instant <1 h) do not cover the reward mechanisms in video games appropriately. Even though there are games in which rewards can be acquired after more than a day (e.g., turn-based online strategy games often require players to wait long periods for reward-worthy items), we struggle to determine which available games apply rewards exclusively over extended or moderate periods, as most games have instant rewards too. Therefore, instead of time intervals when the player is rewarded for achievements, we propose emphasizing the intensity of the reward experience. As response options, we suggest (i) Low intensity: Rewards don't create strong cravings to keep playing, or the game does not provide rewarding experiences too often. (ii) Medium intensity: The game regularly provides rewarding experiences that create some cravings to keep playing. (iii) High intensity: The game constantly provides many rewarding experiences that evoke strong emotional reactions or a strong urge to continue playing. For the exact phrasing, see item 10 in the Appendix.
  - *Real-Life Rewards*: We were uncertain what 'real-life rewards' meant. Therefore, we modified this item to reflect the possibility of obtaining physical products, services, or anything of a monetary value, or earning real-world money through the game or through third-party websites (e.g., converting in-game currency to real-world money; earning in-game cryptocurrencies that can be converted into real-world money; selling in-game items for real-world money; selling game accounts). For the exact phrasing, see item 14 in the Appendix.
- SOCIAL
  - We modified the *Multiplayer* and *Tournaments/Competitions* items to reflect the options of playing cooperatively (item 17) and competitively (in a player-versus-player or PVP mode) (item 18) rather than in a tournament ranking system. We believe tournament ranking is better captured in the Leaderboard question, and the PVP mode option may increase a game's addictive potential (Bäcklund, Elbe, Gavelin, Sörman, & Ljungberg, 2022; Wang & Cheng, 2022). For the exact phrasing of the two items, see the Appendix.

In addition, we modified the broad category of 'Gambling-like features' to 'Gambling-like features and reward mechanisms' because some of the items included do not cover gambling-like features but reward mechanisms.

Removal of items

Two items from the WORLD DESIGN category were removed.

Goal-Oriented World: We argue that objective driven progress and directionality in the game do not necessarily increase the games' addictive potential. For example, platformer games most often have linearity-directionality, and are therefore characterized by high objective driven progress; however, research shows that they are not a genre associated

with high addictive potential (Elliott, Ream, McGinsky, & Dunlap, 2012). Furthermore, open-world action-adventure games such as the Grand Theft Auto or the Assassin's Creed series and MMORPGs should not be scored low because they are characterized by objective driven progress despite the large number of options and choices they offer. Furthermore, open world games such as MMORPGs show a consistent association with GD symptoms (e.g., King et al., 2019; Lemmens & Hendriks, 2016), which may also be due to the large number of options and choices these games offer. Lastly, we also believe that the item "Does the game offer supplementary activities and progression systems?" (merging the (Time) Game Extenders and Meta-Game Rewards items) covers the goal-oriented aspect adequately.

Realism: We argue that this item should be removed for now. Firstly, there is a lack of scientific evidence that augmented reality (AR) and virtual reality (VR) directly increase the addictive potential of video games, and no support that VR is more addictive than AR. Secondly, a distinctive aspect of these technologies is their highly immersive, hyper-realistic graphics. However, it is unclear how graphics relate to GD (Saini & Hodgins, 2023), as video games with poor or unrealistic graphics (e.g., Minecraft or early video games like Space invaders) can also be highly immersive and addictive (Brown & Cairns, 2004; Griffiths, Kuss, & King, 2012; Ross, Finestone, & Lavin, 1982), despite scarce empirical evidence on video games with low-resolution graphics. Furthermore, the exact meaning of the low response option was unclear. Therefore, we decided to remove this item until further evidence is gathered on this matter.

Creation of new items

Beyond supplementary activities and progression systems (e.g., mini-games, challenges, extra achievements) that extend gameplay and provide powerful rewards to encourage prolonged participation, we argue that *premium content/membership/features* for money or extra time investment such as 'battle passes' and subscription models (e.g., the monthly subscription for Eve Online) deserve to be addressed using a separate item. Since the player invests money or a prolonged amount of time in such premium features, this may lead to the so-called sunk cost fallacy (Arkes & Blumer, 1985; Zendle, Cairns, Barnett, & McCall, 2020) or "sunk cost gaming", due to which players may feel urged to continue playing even in cases when the game no longer benefits them and they would otherwise stop playing, all because an initial substantial investment has been made. Research appears to support this, indicating that players who engage with battle passes often feel obligated to continue playing the game following their purchase (Gibson, Griffiths, Calado, & Harris, 2023). For the exact phrasing, see item 6 in the Appendix.

Beyond the possibility of in-game gambling, we also think that it is important to acknowledge the opportunity to gamble or bet on *independent third-party websites or applications* (not built into the game itself) with virtual items such as skins or in-game currency. Even though these opportunities may appear independent of games, in reality, they are not. Gaming communities are largely aware of them and affected by them. For instance, such gambling opportunities through third-party websites offer the possibility for minors to engage in gambling activities, which they are not allowed to do otherwise (Greer, Rockloff, Browne, Hing, & King, 2019). Furthermore, research suggests that skin gambling is associated with both problem gambling and problematic gaming (Hing et al., 2021; Greer, Rockloff, Hing, Browne, & King, 2023). Therefore, we propose having a separate item covering this phenomenon, as such opportunities may arguably increase the addictive potential of specific games. For the exact phrasing, see item 13 in the Appendix.

Furthermore, some games are '*esports titles*,' meaning that they are played in professional competitions that are broadcast, viewed by spectators, and offer prizes for the competitors (Bányai, Griffiths, Király, & Demetrovics, 2018). In addition, some of the successful esports players become celebrities (Su, Wang, & Sun, 2025). We argue that having an esports ecosystem built around a game increases its addictive potential. Firstly, because of the general excitement it creates, driven by enthusiastic fan communities and lucrative sponsorship investments. Research indicates that fandom can even become problematic for a minority of individuals (Zsila et al., 2026). Secondly, as monetary incentives compensate for skillful play, players can be misled into thinking that being a professional player is a secure career path for a wide range of players, whereas a stable, sufficient income as an esports player is only accessible to a rare minority (McLeod, Xue, & Newman, 2022). Finally, qualifying a game as esports significantly increases its popularity as well as the level of gamers' engagement. For instance, aside from playing the game themselves, they may spend prolonged amounts of time viewing others play and follow competitions and important tournaments (Rietz & Hallmann, 2022). Therefore, we propose an item assessing whether the game in question qualifies as an esports title and, if it does, on what level (amateur or professional). For the exact phrasing, see item 19 in the Appendix.

Finally, we propose adding a question regarding the storyline of the games. Although research on the association between GD symptoms and structural characteristics indicates that the narrative aspect of games does not significantly contribute to a disordered state (Rehbein et al., 2021; Saini & Hodgins, 2023), it can certainly contribute to high engagement and increased time spent gaming, and may also lead to a loss of control, at least in the short term. Parallels can be drawn with binge-watching (i.e., viewing multiple episodes of a TV series consecutively), where research has shown associations with negative outcomes and identified the structural characteristics of the series as important contributing factors (Flayelle et al., 2017, 2019). Similarly, based on anecdotal reports, rich and engaging storylines in video games—especially when regularly extended—can make players lose control and immerse themselves in gameplay to a degree that is against their will and may lead to adverse consequences. Thus,

we believe that the narrative aspect is also worth investigating when examining the addictive potential of games, even if empirical research so far offers only partial or uncertain support. Furthermore, we propose including such an item to broaden the range of structural aspects covered by the SHARP-G-R. The item in question addresses the existence of a storyline in the game and offers three response options: (i) the absence of a storyline, (ii) the presence of a moderate storyline that is not the primary focus or appeal of the game, and (iii) the existence of a rich and engaging storyline that captivates most players over time. For the exact phrasing, see item 4 in the Appendix.

Scoring of the items

The SHARP-G instrument uses a scoring of 1, 2, and 3, providing a summarized score ranging from 23 to 69. Instead of this scoring, we propose a scoring of 0, 1, and 2. This way, games with a low addictive potential would have a score closer to 0, increasing the interpretability of the score. Questions with two response options should be scored 0 (for 'no') or 2 (for 'yes'). Consequently, the summarized scores would range from 0 to 48, with higher scores indicating higher addictive potential. To better understand the meaning of interpretation categories, we suggest future studies utilizing the scale to carefully explore the threshold boundaries between highly and moderately addictive games, as well as games with no or low addictive potential.

THE UTILITY AND IMPLICATIONS OF SHARP-G-R

Our priority is to express appraisal to the authors of the SHARP-G instrument. They led a great and meaningful initiative in identifying potentially addictive design features and obtaining feedback on these from researchers, clinicians and individuals who indicated a problem with gaming using a comprehensive and structured Delphi methodology. Without this initial work, we would not have had the opportunity to propose a revised version. As mentioned, we believe that the revised version introduces essential improvements that enhance the readability and interpretability by altering or removing items based on scant research evidence whilst creating new items that cover other presumably important aspects related to the addictive potential of games.

However, we would like to outline that our work is explorative in nature and that the SHARP-G-R requires empirical validation. Future studies, preferably with a longitudinal design, should assess the association between the SHARP-G-R scores of specific video games and GD symptoms scores exhibited by gamers playing these games. Additionally, qualitative research is also necessary to explore how players perceive specific design features to gain a better understanding of how these elements may contribute to the development and maintenance of problematic gaming. Furthermore, given the fast and substantial changes that characterize the video game industry, any instrument that tries to assess the addictive potential of games, including the SHARP-G-R presented here, must be monitored and revised/updated regularly to remain up to date.

It is also essential to acknowledge the inherent limitations of such tools. Notably, no specific game design feature is inherently risky; rather, the risk potential is contingent upon individual player characteristics and contexts. More specifically, the impact of a game's design on a player's behavior and well-being is not solely determined by the design itself but is also significantly influenced by how different players perceive and interact with these features (Flayelle, Andronicos, King, & Billieux, 2025; Karhulahti, 2025). This needs to be considered when applying such instruments in practice.

Furthermore, two other important limitations became clear during the application of these tools in the 'Research Field Practice' courses. First, many video games have multiple game modes (e.g., classic mode, creative mode) and versions or editions (e.g., deluxe edition). These must be rated separately because they may differ in the structural features or game mechanics included in the rating system (e.g., the base game has player-vs-player competition, while other game modes do not have). Therefore, in many cases, it is not possible to apply a single rating to an entire game; instead, specific game modes or versions must be rated individually. Second, Item 2 ('How much does the GAME encourage players to keep playing for a long time in one sitting?') and Item 10 ('How intense does the reward experience feel in the game?') are subjective to a certain degree. While we believe that experts utilizing the instrument can provide relatively objective evaluations, it remains important to acknowledge the inherently subjective nature of these two items (Király et al., 2025).

Nevertheless, within the constraints raised, developing valid and reliable instruments to rate the addictive potential of video games has benefits on a practical level. Disclosing specific design features with heightened potential for addiction risk, as well as overall ratings for the addictive potential of games, perhaps complementing other rating systems (e.g., Pan-European Game Information system [PEGI], the system of the Entertainment Software Rating Board [ESRB]), may help players and families decide which games to choose. Moreover, such information may contribute to raising awareness regarding possible risks, which is key in the self-regulatory processes needed to play video games in a healthy manner (King & Delfabbro, 2017).

Future research should aim to determine the relative importance of specific game design features in the onset and maintenance of problematic gaming behavior. Such studies would enable the weighting of specific features based on their contribution to addiction risk, thereby improving the precision and predictive validity of the SHARP-G-R scale. Additionally, these findings could assist in better understanding the boundary between normal and disordered gaming—a distinction that continues to challenge existing screening measures (King, Billieux, Behm, & Delfabbro, 2025)—as well as inform ethical and age-appropriate game design (King & Delfabbro, 2019). Importantly, our work can support regulators and

policymakers in developing guidelines and/or legal measures that require the gaming industry to adopt the 'safety by design' principle, thereby fostering the creation of video games that prioritize player protection and facilitate their use as healthy and balanced leisure activities. Such guidelines and/or legal measures would align with existing efforts aimed at addressing (e.g., banning or controlling) game design features recognized for their potential to cause harm. The most prominent examples of this include the banning of gambling-like loot boxes in Belgium (Xiao, 2023), the Chinese law requiring gaming companies to report loot box drop rates (Xiao, Henderson, Yang, & Newall, 2024), and regulations limiting potential in-game monetary spending (Xiao et al., 2026).

Finally, the SHARP-G-R scale could also serve as a valuable tool in clinical settings. Integrating it into therapeutic sessions may enhance individuals' awareness of their susceptibility to specific game design elements and their role in the development of addictive patterns. Moreover, its application could facilitate strategies such as selective abstinence, wherein individuals avoid highly addictive features or games containing them, and even self-exclusion from such mechanics, potentially supported by built-in harm reduction measures.

Funding sources: The present work received support from the National Research, Development and Innovation Fund, provided by the Ministry of Culture and Innovation of Hungary, financed under the STARTING_24 funding scheme (project no. STARTING 150089) and from the János Bolyai Research Scholarship of the Hungarian Academy of Sciences.

Authors' contribution: OK was responsible for Conceptualization, Methodology, Investigation, Writing – Original Draft, Writing – Reviewing and Editing. MY, SGC, ÁG, KZC, SP were responsible for Investigation and for Reviewing and Editing. DK and PK were responsible for Reviewing and Editing. All authors commented and revised the manuscript, read, and approved the submitted version.

Conflict of interest: Dana Katz is an Assistant Editor of the Journal of Behavioral Addictions. The other authors declare no conflict of interest.

Acknowledgement: We would also like to thank Efe Çakmak for his valuable insights on the revised instrument and the manuscript.

SUPPLEMENTARY MATERIAL

Supplementary data to this article can be found online at doi: https://doi.org/10.1556/2006.2025.00339.

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APPENDIX

The Saini-Hodgins Addiction Risk Potential of Games Scale - Revised version (SHARP-G-R)

Official game title: _____
Publisher: _____
Date of the rating: _____
Version number of the game (if applicable): _____

Personal Investment

1. Are players incentivized to play the game every day or multiple times a day?
   - ○ No. (0)
   - ○ No, but players are motivated to play the game by deadlines or availability windows for specific activities or rewards (e.g., seasonal events/content/bonuses). (1)
   - ○ Yes, rewards for playing every day or multiple times a day are given; playing every day may be encouraged with reminders and/or push notifications. (2)

2. How much does the GAME encourage players to keep playing for a long time in one sitting?
   - ○ Not at all (The game encourages short sessions (approx. 1 h)). (0)
   - ○ Moderately (The game encourages sessions with a medium length (approx. 2–3 h)). (1)
   - ○ A lot (The game encourages long sessions (3 h or more)). (2)

3. To what degree is the game designed with a definitive conclusive ending, narrative or defined in terms of progression?
   - ○ The game has a definitive ending, narratively or otherwise, beyond which there is no additional in-game content. (0)
   - ○ The game has a definitive ending, narratively or otherwise, beyond which players can experience additional in-game content. (1)
   - ○ The game has NO definitive ending, narratively or otherwise. Each gameplay experience may be unique and there is no clear direction of play. (2)

4. Is there a storyline in the game?
   - ○ No, the game lacks a storyline, or if present, it is minimal, not central, and generally not too engaging. (0)
   - ○ Yes, the game includes a moderate storyline, though it is not the primary focus or appeal. (1)
   - ○ Yes, the game features a rich and engaging storyline that captivates most players over time. (2)

5. Can the player buy in-game items (resources, skins, etc.) using real-world money?
   - ○ No. (0)
   - ○ Yes, but without gaining a competitive advantage (e.g., cosmetics, new levels, and DLCs). (1)
   - ○ Yes, and payment helps advance or be competitive in the game (e.g., buying better gear, weapons, etc.). (2)

6. Does the game offer premium content/membership/features for money or extra time investment (e.g., battle passes, subscription models)?
   - ○ No. (0)
   - ○ Yes, but these are not central features of the game. (1)
   - ○ Yes, and these are central features of the game. (2)

Accessibility

7. Is the game easily accessible?
   - ○ No (The game can only be played on stationary devices like PCs or home consoles). (0)
   - ○ Yes (The game can be played on portable devices such as smartphones and tablets). (2)

8. How much is the full price of the game? (sales don't count). If the basic game is free but it requires buying additional game content such as DLCs, it should still be considered free.
   - ○ Expensive (36 euros/dollars or more) and/or subscription models. (0)
   - ○ Cheap (between 1 and 35 euros/dollars). (1)
   - ○ Free. (2)

Gambling-like features and reward mechanisms

9. 'Near wins' are in-game elements/events designed to make you feel like you are about to win, but then you end up losing at the last moment. (e.g., Fortune wheel: it seems it will stop at a high amount, but then it stops earlier, or it exceeds it; Fighting a boss: you're close to defeating it, but eventually you lose). Does the game comprise near wins?
   - ○ The game has no near win elements/events. (0)
   - ○ The game has some near win elements/events that are not a central aspect of gameplay. (1)
   - ○ The game has a lot of near win elements/events. (2)

10. How intense does the reward experience feel in the game (e.g., emotional excitement, satisfaction, or urge to continue playing)?

- ○ Low intensity: Rewards don't create strong cravings to keep playing or the game does not provide rewarding experiences too often. (0)
- ○ Medium intensity: The game regularly provides rewarding experiences that create some cravings to keep playing. (1)
- ○ High intensity: The game constantly provides many rewarding experiences that evoke strong emotional reactions or a strong urge to continue playing. (2)

11. Does the game include loot boxes?
    Note: Loot boxes are virtual containers that give random rewards. The players don't know what reward they will receive before opening them.
    - ○ No. (0)
    - ○ Yes, but the loot boxes in the game comprise purely cosmetic items that don't provide a competitive advantage. (1)
    - ○ Yes, the loot boxes in the game comprise items which enhance gameplay (provide a competitive advantage). (2)

12. Can players gamble virtually in the game? (any virtual gambling except for loot boxes)
    Note: Gambling is defined as risking something to gain something more valuable.
    - ○ No. (0)
    - ○ Yes, but only with in-game currency, which cannot be bought with real-world money. (1)
    - ○ Yes, with real-world money, or in-game currency that can be bought with real-world money. (2)

13. Does the game have any gambling or betting opportunities involving virtual items or in-game currency, hosted by independent third-party websites or applications (not built into the game itself)?
    - ○ No. (0)
    - ○ Yes. (2)

14. Does the game offer the possibility to obtain physical products or services or anything with a monetary value or to earn real-world money either through the game or through third party websites? (e.g., converting in-game currency to real-world money; earning cryptocurrencies in the game that can be converted into real-world money; selling in-game items for real-world money; selling game accounts)
    - ○ No. (0)
    - ○ Yes. (2)

15. Does the game offer supplementary activities and progression systems—such as mini-games, challenges, extra achievements, or similar add-ons—that not only extend gameplay beyond the core experience but also provide rewards to encourage prolonged participation?
    - ○ Low: The game has no or very few supplementary activities that extend gameplay. (0)
    - ○ Moderate: The game includes a limited number of supplementary activities and progression systems, but they do not significantly extend gameplay. (1)
    - ○ High: The game offers numerous supplementary activities and progression systems that greatly extend gameplay beyond the core experience, encouraging prolonged participation even when players would have otherwise stopped playing. (2)

16. Can unique items (weapons, power-ups, cosmetic items) or characters be obtained as the player progresses the game?
    - ○ No collectibles can be obtained. (0)
    - ○ Yes, collectibles that do not help with progression (such as cosmetics) can be obtained. (1)
    - ○ Yes, collectibles that help with game progression (weapons, power-ups) can be obtained. (2)

Social

17. Can the players play cooperatively in multiplayer mode (either locally or online)?
    - ○ No, there is no option for cooperation. (0)
    - ○ Yes, however, it is optional. (1)
    - ○ Yes, it is required or strongly encouraged. (2)

18. Is there an option for players to compete against one another? Is the game primarily built around player-vs-player (PvP) competition?
    Note: please answer „no", if only leaderboards or other means of performance comparison systems are built into the game.
    - ○ No, there is no such option. (0)
    - ○ Yes, but it is optional. (1)
    - ○ Yes, it is required or strongly encouraged. (2)

19. Does the game have an established professional esports scene with official tournaments where players can compete for fame and rewards?
    - ○ No. (0)
    - ○ Yes, but it is limited to smaller or unofficial/casual tournaments. (1)
    - ○ Yes, the game has well-established esports tournaments with major prizes and big audiences. (2)

20. Can players play together in an organized group (e.g., guilds, clans)?
    - ○ No. (0)
    - ○ Yes, but it is optional. (1)
    - ○ Yes, and it is required or strongly encouraged. (2)

21. Can users interact with each other in-game, by audio or in-game chat?
    - ○ No. (0)
    - ○ Yes, but it is optional. (1)
    - ○ Yes, and it is required or strongly encouraged. (2)

22. Is there a ranking system that shows a player's performance relative to one another? Only leaderboards against other players count, and the leaderboard functionality must be built within the game.
    - ○ No. (0)
    - ○ Yes, but it is not a central feature or only exists in specific modes (e.g. ranked/competitive). (1)

- ○ Yes, performance comparison among players is a central feature of the game. (2)

World design

23. To what extent does the virtual world encourage players to explore and discover on their own accord?
    - ○ Limited: The world offers minimal opportunities for exploration and discovery. (0)
    - ○ Balanced: A mix of guided activities and opportunities for self-directed exploration. (1)
    - ○ Expansive: Strong emphasis on open-ended exploration and player-driven discovery. (2)
24. Does the game require players to repeatedly complete the same tasks over extended periods of time (grinding) to receive rare/unique rewards or to gain advantages that help them progress?
    - ○ No, there is no grinding in the game. (0)
    - ○ Yes, but it is optional and/or not frequent. (1)
    - ○ Yes, grinding is required and/or highly rewarded. (2)