

Research Paper

Development and content validation of the Comprehensive Gaming Behaviour and Addiction Scale

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ABSTRACT

The current instruments that are present in the problematic gaming behavior field focus primarily on addiction symptoms, leaving skills and psychological dimensions untouched. This paper reports the first stage of developing the Comprehensive Gaming Behaviour and Addiction Scale (CGBAS), a multidimensional self-report measure spanning three modules. The three modules that were created are Skills and Positive Outcomes, Addiction and Problematic Use, and Psychological Profile. An initial pool of 135 items spanning 18 domains, along with a 22-item Lie Scale, was created. The items were then evaluated by a 26-member heterogeneous panel. The panel consisted of academic experts, practitioners, gamers, and other professionals. This panel was asked to evaluate the items using a structured Content Validity Index (CVI) procedure across seven quality criteria. Scale-level content validity was strong (S-CVI/Ave = .92); four items were revised, and the original Lie Scale was replaced with six Impression Management items after qualitative panel feedback. The feedback indicated the original items measured substantive constructs rather than response bias. A 90-item pilot instrument was then administered to N = 101 gaming-community respondents. All 20 theoretically specified subscales showed good to excellent internal consistency (Cronbach's α = .802–.937). A preliminary exploratory factor analysis produced a five-factor solution offering early support for the distinctiveness of skill-related items from addiction-related items. The EFA flagged seven items including one Avatar Identification item with a comparatively weak item-total correlation. One item was reworded, and six were retained for monitoring in the main study. These findings suggest that the pilot administration with N = 101 participants provided preliminary support for the item pool. The results from this study helped set up the next phase. A second, substantially larger study evaluated the scale's factor structure and psychometric properties in an independent sample. The larger validation study is reported separately.

Keywords: *Gaming Behavior, Scale Development, Content Validity, Psychometrics, Pilot Study*

Digital gaming in this day and age is no longer exclusively for recreation. Engagement in gaming shows how many people spend their time, interact online, compete and express themselves. With the ease in access to the online world via

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mobile phones there is an increase in the said engagement. This wider access is not negative by itself, but it has increased concern about excessive or poorly regulated gaming in some players. This makes the assessment of gaming-related problems important. The instruments used to assess gaming-related problems—including the Internet Gaming Disorder Scale–Short Form (IGDS9-SF; Pontes & Griffiths, 2015), the Game Addiction Scale (Lemmens, Valkenburg, & Peter, 2009), and the IGD-20 Test (Pontes, Király, Demetrovics, & Griffiths, 2014)—are built around DSM-5 and ICD-11 addiction symptom domains. These instruments are well validated for their intended purpose, but their scope is limited to pathology. A study systematically reviewed 32 gaming disorder assessment tools, drawing on evidence from 320 studies that had used them, and confirmed that none combined adaptive, skill-related, and psychological dimensions within the same framework (King et al., 2020). As a result, intense engagement and compulsive engagement cannot be distinguished. Both these instances simply register as high scorers on an addiction dimension. This does not mean that there are flaws in these well-validated instruments. They measure what they are meant to measure, but they are limited in scope. The broader psychological and behavioral context within which problematic gaming develops therefore remains underassessed.

The CGBAS is mainly formulated around three theoretical frameworks and one supporting body of literature. Together, these perspectives justify the scale's three-module structure: Skills and Positive Outcomes, Addiction and Problematic Use, and Psychological Profile. The purpose of using multiple frameworks is to broaden gaming assessment beyond addiction symptoms alone.

The Skills and Positive Outcomes module is based on Self-Determination Theory. Ryan and Deci (2000) suggest that human motivation is driven by three psychological needs which include competence, autonomy and relatedness. Przybylski, Rigby, and Ryan (2010) specifically looked at video games through this theoretical lens and suggested that games provide players with competence through challenge and feedback, autonomy through choice and control, and relatedness through the social aspects of gaming. Viewing gaming from this perspective means that high involvement in gaming is not inherently pathological. It can also reflect motivation, skill, mastery, or social engagement. That is why the CGBAS has a separate module for skills and positive outcomes instead of viewing all intense gaming as problematic. A study by Pedraza-Ramirez, Sharpe, Behnke, Toth, & Poulus (2025) talks about the influence of affective, cognitive-motor, and social processes on esports. The study furthermore suggested that esports and sport & exercise psychology share a beneficial reciprocal relationship.

The Addiction and Problematic Use module is grounded in the symptom domains identified in the DSM-5 and ICD-11. The domains remain necessary because the scale must be able to identify harmful and dysregulated gaming patterns. However, in the CGBAS, addiction-related symptoms are assessed as one part of the gaming profile rather than as the only meaningful outcome of gaming behavior.

The Psychological Profile module is informed by compensatory internet use theory and Person–Environment Fit Theory. Kardefelt-Winther's (2014) model of compensatory internet use suggests that excessive online engagement may develop when individuals use the internet to cope with offline psychosocial difficulties such as stress, loneliness, or low self-esteem. Escapism may become an enticing motivator to play games as it gives an individual temporary relief from reality. Person–Environment Fit Theory (Edwards & Shipp,

2007) supports this by suggesting that digital gaming may be appealing as their structure fits needs that are not fully met offline. Games often provide immediate feedback, opportunities for social connection, and a sense of control, which may be especially significant for individuals experiencing psychological difficulty offline.

This psychological module does not approach avatar identification as a distinct fourth framework, but rather as a gaming-specific extension. Research on avatar identification and ideal-self-expression shows that players may use game characters to explore identity, express desired qualities, or experience versions of the self that are less available in offline life (Bessière, Seay, & Kiesler, 2007; Klimmt, Hefner, & Vorderer, 2009; Yee & Bailenson, 2007). Including avatar identification allows the CGBAS to capture an identity-related aspect of gaming that is not systematically addressed by addiction-focused instruments.

Together, these frameworks support the central assumption of the CGBAS: gaming behavior is multidimensional. It may involve skill development, psychological compensation, identity expression, and problematic use in different combinations. For this reason, the scale is designed to produce module-level scores rather than a single global addiction score.

CGBAS: Three-Module Architecture

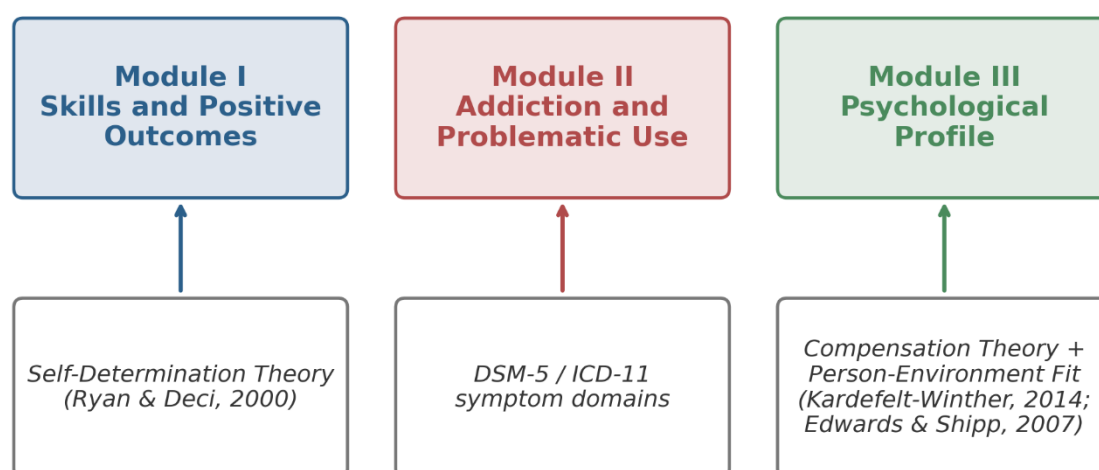


Figure 1. Theoretical grounding of the CGBAS's three-module architecture.

Content validation is an important first step in developing any self-report tool. Reliability and factorial validity can show whether items behave consistently and group together statistically, but they cannot by themselves prove that the items represent the intended construct (Haynes, Richard, & Kubany, 1995). A recent qualitative study regarding content-validity analysis of existing gaming instruments mentioned that several widely used scales do not directly assess the diagnostic criteria that they claim to assess (Karhulahti, Martončík, & Adamkovič, 2023), which highlights the continued importance of structured content validation in this specific field. This was especially important for the CGBAS because it was designed to include skill-related, addiction-related, and psychological aspects of gaming in one framework. Since there was no single existing item pool that could be directly adapted for this purpose, a large pool of candidate items was first created and reviewed before pilot testing, consistent with standard scale-development guidance (Clark & Watson, 1995;

DeVellis, 2017). This process helped identify unclear, redundant, irrelevant, or poorly targeted items before the instrument was administered to participants.

Gaming behavior is both a social and digital culture phenomenon, not just a clinical one. So, the content-validity panel included gamers without formal academic or clinical credentials. They did this alongside academic and practitioner reviewers. The idea was that lived experience can spot issues that training alone might miss. Whether this reasoning held up in practice is one of the empirical questions this paper addresses.

Objectives

This study had two objectives. The first objective was to evaluate whether the CGBAS item pool demonstrates adequate content validity, as evidenced by structured expert and target-population panel review. The second objective was to examine whether a pilot administration of the resulting instrument shows adequate preliminary internal consistency and a factor structure broadly consistent with its theoretical specification. A companion paper reports the subsequent main-study confirmatory validation (N = 953) on an independent, substantially larger sample.

Hypothesis

This study followed an exploratory, hypothesis-generating design, consistent with standard practice in early-stage scale-development and content-validation research (Clark & Watson, 1995; DeVellis, 2017). No directional hypotheses were specified in advance; the study instead addressed the two objectives stated above.

Scientific Tools

The study used the following tools: the 135-item candidate CGBAS item pool developed for formal content-validity review; a structured Content Validity Index (CVI) rating form completed by the 26-member expert and target-population panel across seven quality criteria; the refined 90-item CGBAS pilot instrument (81 substantive items across 20 subscales, six Impression Management items, one attention-check item, and two Validity Index items), administered on a five-point Likert scale; and an online Google Forms survey used for pilot data collection. Statistical analyses (reliability estimation and exploratory factor analysis) were conducted using Jamovi statistical software.

MATERIALS AND METHODS

Item Generation

The process of item generation started with reviewing DSM-5 and ICD-11 addiction criteria. Current gaming-assessment tools were also reviewed. This led to an initial draft of 89 items spanning 11 domains and was called “Internet Gaming Addiction Scale”. This draft went through an informal preliminary review from a gamer and an English language expert between April and June 2024. Starzec et al. (2026) followed a similar approach in developing and validating a tool assessing gaming withdrawal called the Gaming Withdrawal Symptoms Questionnaire (GWSQ). GWSQ was developed by item generation via literature review leading to an initial item pool followed by psychometric validation. After this review, the item pool was expanded, consistent with standard scale-development guidance (Clark & Watson, 1995). It now included 113 items across 18 domains. These were grouped into three modules:

- Skills and Positive Outcomes: Leadership, Problem Solving, Decision Making, Hand–Eye Coordination, Professional Gaming Orientation.

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- Addiction and Problematic Use: Preoccupation, Withdrawal, Tolerance, Loss of Control, Loss of Interest, Continued Use, Deception, Escapism, Relapse, Risk.
- Psychological Profile: Self-Esteem, Loneliness, Introversion.
- A 22-item Lie Scale was also included to check for response bias. Together, they created a 135-item pool for formal content validity review.

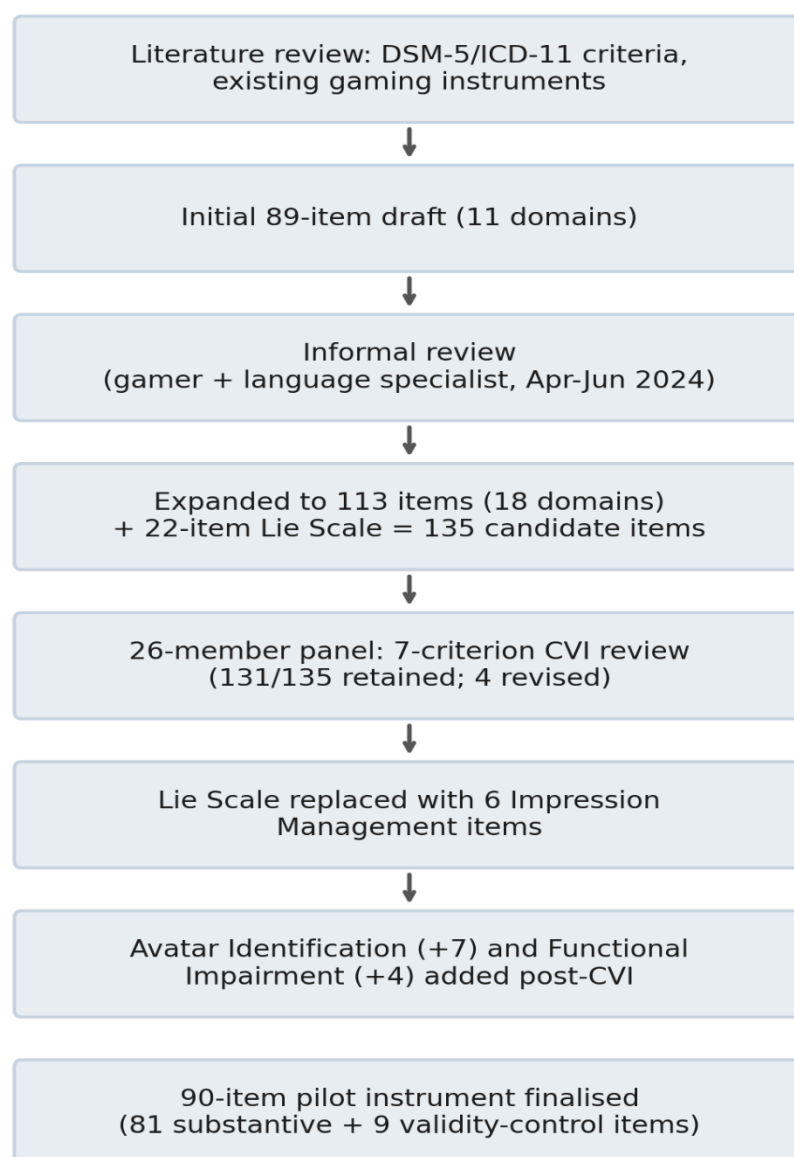


Figure 2. Item generation and refinement pathway from initial draft to the 90-item pilot instrument.

Content Validity: Expert Panel Review

Content validity was assessed using a structured Content Validity Index (CVI) procedure (Lynn, 1986; Polit & Beck, 2006). A panel of 26 reviewers was contacted for this purpose. The panel included four rater perspectives: academic subject-matter experts ($n = 8$), practitioner reviewers ($n = 11$), members of the target population—active gamers without formal academic or clinical background ($n = 4$)—and other professional reviewers ($n = 3$).

Evaluators scored each item using seven criteria instead of just relevance. They used a five-point scale (5 = Excellent to 1 = Poor) for: clarity of directions and items; presentation and organization of items; suitability of items (similar to a relevance rating); adequateness of items per category; attainment of purpose; objectivity; and scale and evaluation rating scale. An item mean was calculated by averaging an evaluator's seven ratings. This composite mean, not just a single score, was used in the item-level dataset. This is a clear shift from Lynn's (1986) original single-dimension relevance rating. In this study, the I-CVI was treated as a composite item-quality index. Content relevance is the most direct component of this index.

Item-level CVI (I-CVI) was calculated as the proportion of the 26 panel members whose composite item mean was 4 or above. Following Lynn's (1986) guidance, an I-CVI of .78 or greater was the threshold for keeping an item without revision. Scale-level content validity was computed in the two forms recommended by Polit and Beck (2006): S-CVI/Ave, the mean I-CVI across all items, and S-CVI/UA, the stricter index requiring universal agreement among all 26 raters.

Evaluators also provided qualitative comments regarding the items in each dimension. These comments were reviewed alongside the CVI scores when finalizing items for pilot administration.

Pilot Participants and Procedure

A total of 101 participants ($N = 101$) were recruited through online gaming communities on Reddit (including r/SampleSize, r/casualgaming, and r/gameaddict), Discord, and personal networks. Recruitment was deliberately confined to smaller and casual communities at this stage. Larger gaming communities and the Prolific Academic panel were reserved for the main study. Sampling followed a non-probability convenience approach (Etikan, Musa, & Alkassim, 2016). The survey link was posted in these communities, and interested participants accessed it voluntarily. To be eligible, participants needed to engage voluntarily with one of the recruitment communities listed above. These communities were selected because they were likely to include individuals with an interest in or experience with video gaming. Additionally, participants had to provide informed consent and complete the survey through a Google Forms link.

No formal data-quality exclusion criteria were applied at this stage, such as attention-check or straight-line response screening. Instead, the Impression Management, attention-check, and validity-index items in the 90-item instrument were later used to exclude cases in the main study.

Participants ranged in age from 18 to 64 years ($M = 27.41$, $SD = 9.74$) and comprised 54 males (53.5%), 44 females (43.6%), and 3 non-binary individuals (3.0%). Bachelor's degree was the most common educational qualification (45.5%), followed by Master's degree (29.7%) and secondary school completion (13.9%). Self-reported weekly gaming engagement was concentrated at the lower end, with the largest groups reporting 1–5 hours (38.6%) and less than 1 hour (24.8%) per week; a smaller subgroup reported heavier engagement of 11 or more hours weekly (23.8% combined). Most participants were nonetheless highly experienced gamers. This profile shows mostly casual to moderate weekly engagement. It also includes significant lifetime experience. This context helps explain the floor effects seen in several addiction-domain items in the reliability results below.

Table 1. Demographic Characteristics of the Pilot Sample (N = 101)

Characteristic	Category	n (%)
Gender	Male	54 (53.5%)
	Female	44 (43.6%)
	Non-binary	3 (3.0%)
Age	M = 27.41, SD = 9.74, range 18–64	101 (100%)
Education	Bachelor's degree	46 (45.5%)
	Master's degree	30 (29.7%)
	Secondary school	14 (13.9%)
Weekly gaming hours	1–5 hours	39 (38.6%)
	Less than 1 hour	25 (24.8%)
	11 or more hours	24 (23.8%)

Note. Percentages are rounded to one decimal place. Only the three most frequent education and weekly-hours categories are displayed.

Analytic Plan

Internal consistency for each of the 20 subscales was assessed using Cronbach's alpha and McDonald's omega. Alpha for the three two-item subscales—Problem Solving, Decision Making, and Professional Gaming Orientation—reduces mathematically to the inter-item correlation via the Spearman–Brown formula, which gave values of .706, .709, and .672. Inter-item Pearson correlations were computed for all subscales against the recommended $r = .30$ –.70 range (Clark & Watson, 1995). Two of the three two-item subscales were slightly above the upper bound and were therefore reported exactly. A preliminary exploratory factor analysis used Minimum Residual extraction and Oblimin rotation. It looked at how well the item groupings matched the theoretical specification. Factor retention was determined through parallel analysis. Consistent with standard scale-development practice (Clark & Watson, 1995; DeVellis, 2017), no items were removed outright at the pilot stage. Decisions about item deletion were saved for the main study, which consisted of a larger sample. All pilot-stage estimates were treated as preliminary.

Psychological Variables

The CGBAS pilot instrument assessed variables organized across three modules. The Skills and Positive Outcomes module assessed Leadership, Problem Solving, Decision Making, Hand–Eye Coordination, and Professional Gaming Orientation. The Addiction and Problematic Use module assessed Preoccupation, Withdrawal, Tolerance, Loss of Control, Loss of Interest, Continued Use, Deception, Escapism, Relapse, Risk, and Functional Impairment. The Psychological Profile module assessed Self-Esteem, Loneliness, Introversion, and Avatar Identification. Two additional response-validity constructs—Impression Management and an attention-check/Validity Index—were included to support data-quality screening in later stages of the research programme.

RESULTS AND DISCUSSION

The first stage of developing and validating the CGBAS resulted in a highly content-valid, internally consistent 90-item pilot instrument, grounded in three theoretically derived modules. This is an important step, as the CGBAS aims to bring skill-related, addiction-related, and psychological dimensions of gaming into one framework—something no existing gaming-assessment instrument currently covers.

Content Validity Outcomes

Out of the 135 candidate items, 131 (97.0%) met or exceeded the I-CVI retention threshold on first review. Scale-level content validity was also strong (S-CVI/Ave = .92). The stricter S-CVI/UA was .10 (13 of 135 items). This lower value was expected because universal agreement becomes harder to achieve as the number of reviewers increases (Polit, Beck, & Owen, 2007). Four items, one each from the Withdrawal, Tolerance, Professional Gaming Orientation, and Problem Solving domains, fell below threshold (I-CVI = .69–.77). Based on these results the items were revised rather than removed. The panel's qualitative remarks were focused on the wording of the items rather than their construct relevance. For three of these four items, it was specifically the gamer raters who identified the underlying issue first.

Table 2. Content Validity Index Summary for the Initial 135-Item CGBAS Pool

Index	Value	Benchmark
Items meeting, I-CVI $\geq$.78	131 / 135 (97.0%)	—
S-CVI/Ave	.92	$\geq$.90 (excellent)
S-CVI/UA	.10 (13 items)	Falls mechanically with panel size
Expert panel size	26 raters (8 academic, 11 practitioner, 4 gamer, 3 other)	—

Note. I-CVI = Item-Level Content Validity Index; S-CVI/Ave = scale-level CVI, average method; S-CVI/UA = scale-level CVI, universal-agreement method (Polit & Beck, 2006).

All 22 Lie Scale items individually cleared the I-CVI threshold. However, qualitative feedback indicated that several items were not functioning as response-bias items and instead overlapped with substantive constructs already represented elsewhere in the scale, such as introversion and self-esteem. The qualitative feedback also helped identify redundancy. For this reason, the Lie Scale was replaced with six Impression Management items (Paulhus, 1984). Two further subscales were incorporated after the formal panel review concluded: Functional Impairment (4 items), assembled from already-reviewed consequence-related content, and Avatar Identification (7 items) that were reviewed for face validity before pilot administration but were not included in the formal panel rating.

The strong content-validity results suggest that the initial item pool was generally aligned with the intended constructs. Only four of the 135 items fell below the retention threshold, and the S-CVI/Ave was .92. Importantly, three of the four flagged items were first identified by gamer or target-population raters. This supports the decision to include reviewers with lived gaming experience in the content-validation panel. Their feedback helped identify item-level issues that may not have been visible through academic or clinical review alone. This is important because gaming behavior is not only a clinical issue; it is also shaped by gaming culture, language, and player experience.

Replacing the original 22-item Lie Scale with six Impression Management items was a defensible action. All 22 original items individually cleared the I-CVI threshold and could have been retained on quantitative grounds alone. The decision to replace was based entirely on the panel's qualitative feedback which mentioned that the Lie Scale items measure constructs which were already represented elsewhere in the CGBAS. The Lie Scale items were not functioning as genuine response-bias checks. Retaining them would have introduced construct redundancy. This episode also illustrates a broader point: a quantitative

CVI threshold alone would have missed this problem entirely, highlighting the value of focusing on the qualitative feedback alongside the numbers.

Pilot Reliability

All 20 theoretically defined subscales showed good to excellent internal consistency. The Cronbach's alpha ranged from .802 (Professional Gaming Orientation) to .937 (Continued Use), and none of the subscales fell below the .80 benchmark. The close correspondence between alpha and omega values pointed out that reliability estimates were steady across methods at this stage. Jahrami et al. (2024) conducted a reliability generalization meta-analysis and psychometric review of the Gaming Disorder Test (GDT) confirming good internal consistency across various studies. This study points out the ongoing efforts to report reliability in the field of gaming-assessments.

Table 3. Internal Consistency Statistics for All 20 CGBAS Subscales (N = 101)

Module	Subscale	Items	α	ω
Skills and Positive Outcomes	Leadership	3	.867	.868
Skills and Positive Outcomes	Problem Solving	2	.827	.828
Skills and Positive Outcomes	Decision Making	2	.830	.830
Skills and Positive Outcomes	Hand-Eye Coordination	3	.901	.906
Skills and Positive Outcomes	Professional Gaming Orientation	2	.802	.804
Addiction and Problematic Use	Preoccupation	6	.904	.906
Addiction and Problematic Use	Withdrawal	5	.923	.929
Addiction and Problematic Use	Tolerance	3	.859	.868
Addiction and Problematic Use	Loss of Control	5	.892	.897
Addiction and Problematic Use	Loss of Interest	4	.855	.857
Addiction and Problematic Use	Continued Use	5	.937	.938
Addiction and Problematic Use	Deception	3	.856	.858
Addiction and Problematic Use	Escapism	4	.898	.899
Addiction and Problematic Use	Relapse	3	.931	.933
Addiction and Problematic Use	Risk	4	.898	.905
Addiction and Problematic Use	Functional Impairment	4	.855	.861
Psychological Profile	Self-Esteem	6	.923	.925
Psychological Profile	Loneliness	5	.884	.886
Psychological Profile	Introversion	5	.887	.888
Psychological Profile	Avatar Identification	7	.916	.917

Note. α = Cronbach's alpha; ω = McDonald's omega. For the three two-item subscales (Problem Solving, Decision Making, Professional Gaming Orientation), α is a direct function of the inter-item correlation via the Spearman-Brown formula; inter-item r values were .706, .709, and .672 respectively, two sat marginally above the conventional .30–.70 range (Clark & Watson, 1995).

Through the item-level assessment, the weakest item belonged to Avatar Identification, specifically AI7 ($r = .532$). Removing AI7 would increase the alpha value for Avatar Identification from .916 to .923.

Preliminary Factor Structure

Bartlett's test of sphericity was significant, $\chi^2(3240) = 9,338$, $p < .001$. The overall Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was .764, which is considered acceptable (Kaiser, 1974). A preliminary exploratory factor analysis was conducted on the 81 pilot items using Minimum Residual extraction and Oblimin rotation. Eight factors had

eigenvalues greater than 1. Parallel analysis, which compares these to 500 random data simulations, indicated that five factors should be retained. These five factors accounted for 58.6% of the total variance.

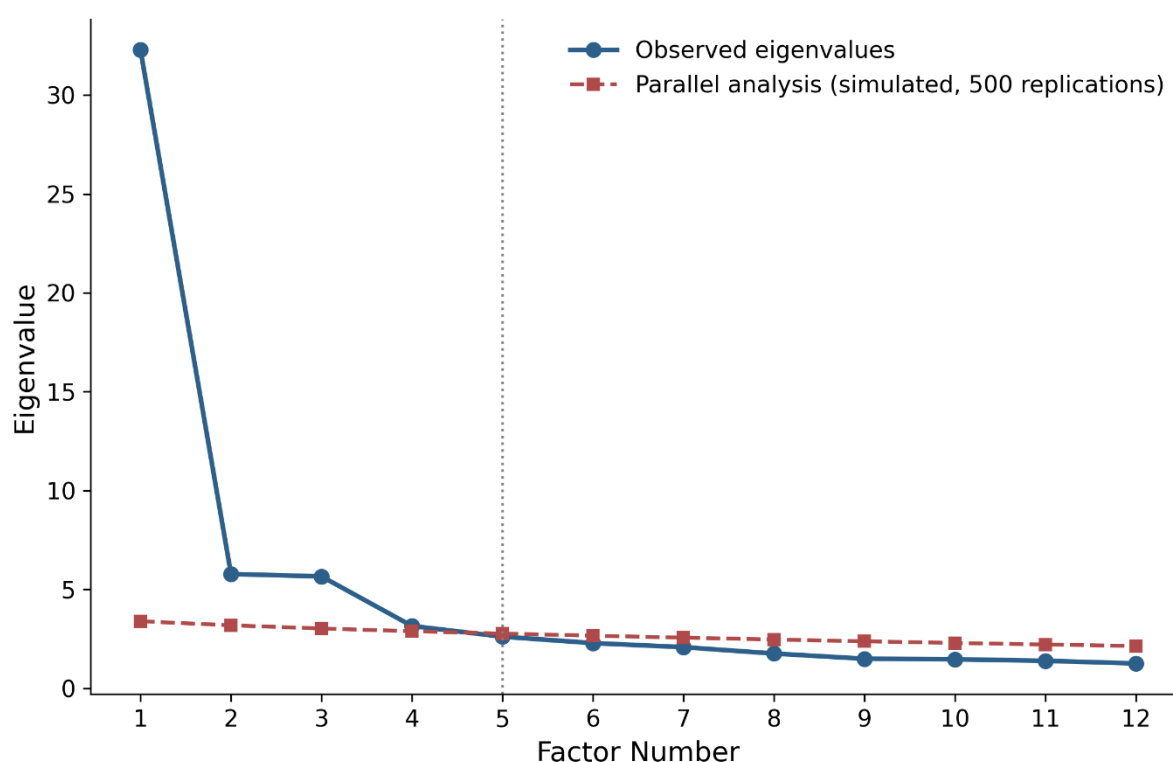


Figure 3. Scree plot showing observed eigenvalues compared to simulated eigenvalues from parallel analysis. This is based on the raw pilot correlation matrix ($N = 101$, 81 items; 500 simulations).

Table 4. Preliminary Five-Factor EFA Structure and Variance Explained ($N = 101$)

Factor	Label	% Variance	Interpretation
1	Problematic Gaming Behaviors	19.91%	Core addiction behaviors: continued use, deception, loss of interest, risk, relapse
2	Psychological Distress and Identity	13.33%	Negative self-concept, loneliness, introversion, avatar identity as shared vulnerability
3	Preoccupation and Withdrawal	13.20%	Cognitive preoccupation and emotional withdrawal as a unified absorption factor
4	Positive Gaming Skills	9.04%	Skill-development items, cleanly separated from addiction domains
5	Unclear / Weak	3.15%	Weak factor (SS loading = 2.55); flagged as unlikely to replicate

Note. Extraction: Minimum Residual with Oblimin rotation. Inter-factor correlations ranged from .001 to .586, supporting oblique rotation. Factor retention via parallel analysis.

The Skills and Positive Outcomes items formed a clear separate structure (Factor 4). They did not overlap with addiction or psychological distress items. This clean separation offers early empirical support for treating Skills and Positive Outcomes as a distinct module. Preoccupation and Withdrawal converged into a single factor (Factor 3). This was consistent

with the close conceptual relationship between preoccupation and withdrawal in addiction frameworks. Factor 5 was comparatively weak and it was treated with caution.

Seven items showed loading patterns worth noting before the main analysis began. PS1 proved the most worrisome. Its negatively loaded value ($-.351$) combined with the lowest KMO for an individual item within the whole scale (.425) indicated that it did not function cohesively with the other items intended to measure the same construct. AI7 showed a unique loading pattern. It had a low but clear cross-loading between Factor 1 (.337) and Factor 2 (.307). It also had the lowest item-total correlation in the pilot scale ($r = .532$). This aligns with the idea that AI7 captures more behavioral traits of engagement with an avatar, while the other six Avatar Identification items focus on psychological identification. The remaining five flagged items included T2, LC1, SE6, LO5, and IN5. They all had moderate cross-loadings, but they were considered theoretically justified. For example, the cross-loading between addiction and distress factors in SE6 supports the compensation theory. In this interpretation, gaming may function as a compensatory source of self-worth for some players.

This five-factor solution does not replace the original 20-subscale structure from the pilot stage. The sample size of 101 was too small for 81 items, which does not meet the recommended 10:1 ratio for exploratory factor analysis. A stable and fully differentiated factor solution is unlikely now. The broader clustering observed in the pilot was treated as compatible with, rather than a replacement for, the more detailed theoretical structure. This structure can be explored better with a larger sample. No items were removed at this stage. One item (PS1) was reworded based on feedback from the panel and pilot. Six more items (AI7, T2, LC1, SE6, LO5, IN5) were noted for ongoing monitoring. They will stay the same for further review in the main study.

The pilot results, taken as a whole, support proceeding to full-scale validation rather than revising the item pool further before doing so. None of the subscales was below the reliability threshold of .80, while the EFA yielded a meaningful five-factor structure even if it could not replicate the full 20-subscale structure; even so, the meaningful pattern included a clear differentiation of skills questions along with DSM-5 consistent merging of Preoccupation and Withdrawal instead of an uninterpretable one. That pattern provides grounds for moving to a confirmatory sample rather than labeling the structure as final or dropping the theoretical model altogether for the empirical grouping.

The EFA findings need caution here for a specific, quantifiable reason: 101 participants against 81 items falls well short of the 10:1 ratio conventionally recommended for stable estimation. So the five-factor solution is read as suggestive of broader clustering among the theoretically derived domains, not a competing structure to weigh against the 20-subscale specification. That is also why item deletion was deferred to the main study.

Avatar Identification required particular caution. AI7 had the weakest item-total correlation in the pilot pool, and the Avatar Identification items had been written after the formal content-validity panel had already concluded. Although the subscale showed strong internal consistency at the pilot stage, these two issues meant that its performance needed to be checked carefully in the main study. AI7, in particular, needed to be examined before deciding whether it should remain in the final scale.

The main limitation of this pilot study was its scale. The sample was adequate for preliminary item screening and reliability estimation, but not for confirmatory factor analysis, known-groups validation, or measurement invariance testing. The sample was also concentrated in casual-to-moderate weekly engagement, which may have contributed to floor effects on some addiction-domain items. No formal post-hoc data-quality exclusion criteria—such as attention-check or straight-line-response screening—were applied at the pilot stage, a further limitation relative to the more rigorous screening used in the main study. The larger main study was designed to address these limitations by recruiting a broader and higher-variance sample.

CONCLUSIONS

This study reports the first stage of CGBAS development, including item generation, structured content validation, and pilot testing. Findings supported the content validity of the item pool and indicated acceptable preliminary reliability across the 20 proposed subscales. The pilot also identified items that needed revision or monitoring, especially within Avatar Identification. Overall, the study provided a foundation for the larger main-study validation, while keeping the pilot findings appropriately preliminary. There is a glaring multidimensional gap in the field of gaming-assessments. Recent studies validating gaming disorder instruments across Asian populations, including India (Kukreti et al., 2025) and Vietnam (Ruckwongpatr et al., 2024) have continued to focus on addiction-only tools. The CGBAS answers this gap by contributing a multidimensional and culturally relevant tool to the existing field of gaming assessments.

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Conflict of Interest

The author(s) declared no conflict of interest.

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