SCIENTIFIC CULTURE

www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 2.1, (2026), pp. 9991-10002
Open Access. Online & Print

DOI: 10.5281/zenodo.20008245

THE IMPULSIVE BEHAVIOR SHORT SCALE–8 (I-8): PSYCHOMETRIC EVALUATION OF THE ARABIC VERSION IN SAUDI ADOLESCENTS

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Received: 02/04/2026
Accepted: 23/04/2026

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ABSTRACT

This study aimed to examine the psychometric properties of the Arabic version of the Impulsive Behavior Short Scale–8 (I-8) in a sample of Saudi adolescents. A total of 257 participants completed the scale. The factorial structure was investigated using both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Results from EFA supported a dominant one-factor solution, accounting for a substantial proportion of variance, suggesting the presence of a general impulsivity construct. This structure was further confirmed by CFA, which demonstrated excellent model fit indices (CFI = .96, TLI = .95, RMSEA = .05, SRMR = .04) following minor model refinement. Reliability analysis indicated acceptable internal reliability for the total scale (α = .75), while subscale reliability coefficients were notably high. Convergent validity was supported through composite reliability (CR = .90) and average variance extracted (AVE = .50). The findings suggest that, despite its theoretical multidimensional basis, the Arabic version of the I-8 functions as a unidimensional measure within this cultural context, capturing a higher-order impulsivity construct. Overall, the results provide strong evidence for the reliability and validity of the Arabic I-8 as a brief and efficient tool for assessing impulsivity among Saudi adolescents. The study contributes to cross-cultural psychometric research and supports the use of the scale in both research and applied settings within Arab populations.

KEYWORDS: Impulsivity, I-8 Scale, Psychometrics, Validity, Reliability, Factor Analysis, Saudi Adolescents, Scale Adaptation.

1. INTRODUCTION

The mechanism of diffused water through the surface of archaeological Obsidian blades, a mainly temperature-dependent and concentration-driven phenomenon, related to the obsidian hydration dating (OHD), is a subject of ongoing development[1].

Diffusion is an essential transport in many rock and biological systems and is known to be susceptible to environmental and intrinsic structure and inhomo-geneity. The most basic definition of diffusion is that it presumes a homogeneous environment with a con-tinuously increasing mean squared displacement and a Gaussian distribution of particle displacements.

Impulsivity is a core psychological construct that plays a significant role in shaping human behavior and has received extensive attention in psychology and neuroscience. In adolescence, a developmental period characterized by heightened vulnerability and rapid psychological change, impulsivity becomes particularly relevant due to its association with risk-taking, emotional dysregulation, and maladaptive decision-making. Accordingly, there is an increasing need for reliable, valid, and culturally appropriate instruments to assess impulsivity in diverse populations.

Conceptually, impulsivity is a multifaceted construct involving the interaction of cognitive, behavioral, and emotional processes. It extends beyond simple spontaneous action to include difficulties in response inhibition, preference for immediate over delayed rewards, and reduced consideration of future consequences (Robbins & Bari, 2013). Contemporary theoretical frameworks emphasize its multidimensional nature, commonly represented through facets such as urgency, lack of perseverance, lack of premeditation, and sensation seeking (Whiteside & Lynam, 2001; Bari & Robbins, 2013).

From a neuropsychological perspective, impulsivity is associated with imbalances between brain systems responsible for reward processing and those involved in cognitive control and self-regulation. During adolescence, the relative immaturity of prefrontal regulatory systems compared with subcortical reward networks contributes to increased impulsive tendencies (Li et al., 2023). In addition, neurobiological evidence highlights the role of dopaminergic and serotonergic systems in regulating impulsive behavior, suggesting that impulsivity reflects both structural and functional brain processes (VandenBos, 2015).

Environmental and contextual factors further contribute to the expression of impulsivity. Family dynamics, peer influence, academic stress, and broader social conditions have all been shown to shape the development and manifestation of impulsive behaviors during adolescence (Danh, 2022; Al-Balidi & Sama, 2025). This interaction between biological predispositions and environmental influences supports contemporary views of impulsivity as a dynamic and context-sensitive construct rather than a fixed trait.

Despite its theoretical importance, the measurement of impulsivity remains a methodological challenge. Many widely used instruments were developed in Western contexts and may not fully capture culturally specific manifestations of impulsive behavior. Moreover, while early measures often conceptualized impulsivity as a unidimensional construct, more recent evidence supports its multidimensional structure (Bari & Robbins, 2013), highlighting the need for updated and culturally adapted assessment tools.

The Short Impulsivity Scale (I-8) was developed to address these limitations by providing a brief measure that captures four theoretically grounded dimensions: urgency, lack of deliberation, lack of perseverance, and sensation seeking. Although the scale has demonstrated acceptable psychometric properties in several cultural contexts, evidence regarding its validity in Arab populations—particularly within Saudi society—remains limited. This gap is especially important in adolescent samples, where impulsivity plays a critical role in behavioral and psychosocial adjustment.

Accordingly, the present study aims to evaluate the psychometric properties of the Arabic version of the I-8 within a Saudi adolescent sample. Specifically, the study examines its factorial structure, construct validity, and reliability to determine its suitability for use in this cultural context. By doing so, this research seeks to contribute to the cross-cultural validation literature and to provide a robust tool for assessing impulsivity in Arabic-speaking populations.

1.1. Study Problem

The present study seeks to investigate the psychometric properties of the Adolescent Impulsivity Scale. Specifically, it aims to address the following research questions:

1. To what extent is the impulsivity scale represented by a clear factorial structure or

[1] FootNote here.

multiple underlying dimensions?
2. To what extent does the impulsivity scale demonstrate acceptable levels of validity?
3. How reliable is the impulsivity scale in measuring impulsivity among adolescents?

The significance of this problem lies in the conceptualization of impulsivity as a relative deficiency in behavioral control. Whiteside and Lynam (2001) proposed that impulsivity comprises four key dimensions: urgency, lack of premeditation, lack of perseverance, and sensation seeking. These dimensions have been consistently linked to a range of maladaptive outcomes, including risky behaviors and various psychological disorders (Dick et al.; Miller et al., 2003). Consequently, ensuring the accuracy and psychometric soundness of impulsivity measures is essential for advancing research in this area and for supporting valid interpretation of findings in psychological assessment.

In this context, the Short Impulsivity Scale (I-8), developed by Kovaleva et al. (2014), was designed as a brief and efficient instrument for assessing the four core dimensions of impulsivity. Each dimension is represented by only two items, allowing for a concise yet comprehensive assessment, and offering a practical alternative to longer measures such as the UPPS scale (Whiteside & Lynam, 2001). Although an English version of the scale is available, empirical evidence supporting its psychometric adequacy across diverse cultural contexts—particularly in Arabic settings—remains limited. This underscores the need for systematic procedures of cultural adaptation, as well as rigorous evaluation of its validity and reliability.

1.2. Objective of the Present Study.

The present study aims to address this gap by examining the psychometric properties of the I-8 scale within the target population. Specifically, it seeks to evaluate its validity and reliability, as well as to test measurement invariance between the Arabic version and the original German version. Establishing such invariance is a critical prerequisite for ensuring the comparability of findings across cultures and for supporting meaningful cross-cultural research (Chen, 2008; Vandenberg & Lance, 2000).

2. THEORETICAL BACKGROUND

2.1. Impulsivity

Impulsivity is widely conceptualized as a multidimensional psychological construct reflecting an individual's tendency to react rapidly and without prior planning to internal or external stimuli, often with insufficient consideration of potential consequences. Such patterns of responding are commonly viewed as indicative of diminished self-regulatory capacity and limited reflective processing.

Although definitions of impulsivity vary across the psychological literature, there is a broad consensus that it represents a behavioral disposition characterized by reduced self-control and a lack of deliberation before action. Dick et al. (2010) conceptualize impulsivity as involving decreased sensitivity to negative consequences, coupled with a tendency toward rapid, unplanned responses to stimuli without adequate cognitive evaluation or consideration of long-term outcomes. Similarly, Al-Shafei (2013) describes impulsivity as an individual's inability to inhibit behaviors that may be harmful to oneself or others, encompassing a range of actions marked by insufficient foresight, weak planning, and a propensity for hasty reactions that often result in unfavorable consequences

From a broader, more integrative perspective, Al-Ruwaii and Ismail (2024) conceptualize impulsivity as a dispositional tendency to respond to internal and external stimuli without sufficient forethought or prior planning, often accompanied by discomfort, distractibility, difficulties with sustained attention, and impaired regulation of thoughts and emotions. They further note that this construct can be operationalized through individuals' scores on standardized impulsivity measures, such as those administered to students at the Police College in the State of Kuwait.

Individuals exhibiting high levels of impulsivity are typically characterized by reduced concentration, heightened distractibility, and less effective cognitive and emotional regulation, which may adversely affect both academic performance and social functioning. In contrast, individuals with lower levels of impulsivity tend to demonstrate greater capacity for behavioral inhibition, more deliberate responding, and a reduced likelihood of committing behavioral errors (Al-Ruwaii & Ismail, 2024).

2.2. Theoretical Dimensions of Impulsivity

Whiteside and Lynam (2001) proposed a multidimensional framework of impulsivity comprising four core dimensions. The first, urgency, refers to the tendency to act rashly under conditions of intense emotional arousal. The second, lack of premeditation, reflects a propensity to make decisions without adequately considering their potential consequences. The third dimension, lack of perseverance, denotes difficulty in sustaining attention and effort when engaging in tasks that are

perceived as boring or demanding. Finally, sensation seeking captures the inclination to pursue novel, stimulating, and potentially risky experiences.

These dimensions are theoretically linked to the Five-Factor Model of personality (Costa & McCrae, 1992). Specifically, urgency is associated with neuroticism, while lack of premeditation and lack of perseverance are related to low conscientiousness. Sensation seeking, in turn, is closely aligned with extraversion (Whiteside & Lynam, 2001) In an earlier conceptualization, Webster and Jackson (1977) classified impulsivity into five broad categories, including impaired interpersonal functioning, deficient planning ability, distorted self-concept, elevated levels of anger and aggression, and reduced sense of responsibility. They further noted that individuals high in impulsivity tend to exhibit a range of behavioral and emotional characteristics, such as dichotomous thinking (i.e., perceiving others as entirely good or entirely bad), limited capacity for future planning, and a strong preference for immediate gratification. Moreover, such individuals often avoid distressing emotional experiences and display heightened tendencies toward anger, rebellion, and aggression—including behaviors directed toward close social relationships. These patterns are frequently accompanied by low tolerance for criticism and increased feelings of discomfort and anxiety (Hassan & Mufti, 2023). development of the Short Impulsivity Scale (I-8).

To facilitate the assessment of impulsive behavior in research contexts constrained by time and resources, Kovaleva et al. (2014) developed the Skala Impulsives-Verhalten-8 (I-8), a brief German-language measure of impulsivity. The scale was designed to capture the four dimensions of the UPPS model using only two items per dimension, thereby offering a concise yet practically efficient alternative to longer instruments.

The development of the I-8 scale was primarily informed by two German adaptations of the UPPS scale (Keye et al., 2009; Schmidt et al., 2008). Item selection was guided by factor analytic findings and the stability of factor loadings across multiple studies. For the dimensions of urgency, lack of premeditation, and lack of perseverance, the authors drew on both theoretical considerations and empirical evidence to identify the most representative and frequently validated items for each construct.

With respect to sensation seeking, an initial pool of six items was generated based on the original UPPS framework (Whiteside & Lynam, 2001). These items were subsequently reduced to two through factor analysis and examination of inter-item correlations within the initial sample (Kovaleva et al., 2014). The preliminary version of the scale was then subjected to cognitive testing, and refinements were made based on participant feedback before final administration.

The psychometric properties of the I-8 were evaluated across three large and independent samples representative of the adult population in Germany (Kovaleva et al., 2014). The findings supported the proposed four-factor structure and demonstrated satisfactory levels of validity and reliability, indicating that the scale is a robust instrument for assessing impulsivity-related traits.

To extend its applicability to English-speaking research contexts, Kovaleva et al. (2014) translated and adapted the scale into English in accordance with the guidelines of the International Test Commission (2010) and the TRAPD model (Translation, Review, Adjudication, Pretesting, and Documentation). This process involved independent translations by professional translators (covering both British and American English), followed by systematic review and reconciliation by a panel of psychometric experts and specialized linguists to ensure both linguistic accuracy and cultural appropriateness.

Despite these efforts, empirical evidence regarding the psychometric adequacy of the Arabic version of the I-8 scale remains scarce. This underscores the need for rigorous standardization and validation studies within Arab cultural contexts.

3. METHOD

3.1. Participants.

A total of 257 participants took part in this study, and their sociodemographic characteristics are summarized in Table 1.

Table 1: Sociodemographic characteristics of the participants (N = 257).

Variable	Category	Frequency (n)	Percent (%)
Age (years)	**M=16**		
	SD=± 1.10		
Gender	Male	168	61.1
	Female	89	32.4
	Total	**257**	**93.5**
History of psychiatric disorder	No	237	92.9
	Yes	20	7.7
	Total (valid cases)	**257**	**100**
Psychotropic medication	No	242	**94.1**
	Yes	15	
	Total (valid cases)	**257**	**100**

The table summarizes the demographic and clinical characteristics of the study sample, which comprised 257 participants.

About age, participants had a mean age of 16 years (M = 16, SD = ± 1.10), suggesting a relatively narrow age range and a generally homogeneous group within the mid-adolescent stage.

In terms of gender distribution, the sample was mainly male, with 168 participants (61.1%), compared to 89 females (32.4%). The remaining proportion corresponds to missing or non-specified responses for this variable. Overall, the valid cases represented 93.5% of the total sample.

Concerning psychiatric history, the findings indicate that most participants had no previous diagnosis of psychiatric disorders, with 237 individuals (92.9%) reporting no history, whereas 20 participants (7.7%) reported having a diagnosed psychiatric condition.

Regarding psychotropic medication use, the vast majority of participants reported not using such medications, with 242 individuals (94.1%) indicating no use, while 15 participants reported current use. The analyses were conducted based on all valid cases (N = 257).

Overall, the results suggest that the sample is largely composed of psychologically healthy adolescents, with minimal exposure to psychiatric disorders or psychotropic medication, and a clear predominance of male participants. These characteristics should be taken into account when interpreting the findings and considering their generalizability.

3.2. Measures

3.2.1. Sociodemographic Data

Form, developed by the researcher, was employed to gather essential background information on participants, including demographic characteristics and psychiatric history, with particular attention to the presence of psychological disorders and related difficulties .

The Short Impulsivity Scale (I-8)

The Impulsivity Scale (I-8), developed by Kovaleva et al. (2014), is a brief self-report instrument consisting of eight items designed to assess four key dimensions of impulsive behavior: urgency, lack of premeditation, lack of perseverance, and sensation seeking. Each of these dimensions is represented by two items. In the present study, items (1) and (2) measure urgency, items (3) and (4) assess lack of premeditation, items (5) and (6) reflect lack of perseverance, and items (7) and (8) correspond to sensation seeking.

All items are rated on a five-point Likert-type scale ranging from (1) "not applicable at all" to (5) "fully applicable," allowing participants to indicate the extent to which each statement reflects their behavior or tendencies. It is important to note that items (1), (2), (7), and (8) are positively worded, whereas items (3), (4), (5), and (6) are reverse-scored to ensure that higher scores consistently reflect higher levels of impulsivity, particularly in relation to lack of planning and lack of perseverance.

Validation studies of the original version of the scale have demonstrated strong and consistent psychometric performance across various clinical samples. The instrument showed excellent internal consistency, with Cronbach's alpha coefficients ranging from 0.94 to 0.97, indicating a high level of reliability and measurement stability. In addition, test–retest reliability over a one-week interval revealed good temporal stability (r = 0.82), further supporting the consistency of the scale over time.

Evidence for convergent validity was established through significant associations with established measures of psychological symptoms. Specifically, strong positive correlations were observed with the Beck Depression Inventory (BDI; r = 0.83) and the Global Severity Index of the SCL-90-R (r = 0.48). In contrast, the scale demonstrated strong negative correlations with subjective well-being indicators (VAS), ranging from −0.63 to −0.73, which aligns well with theoretical expectations linking higher symptom severity to lower psychological well-being.

Regarding construct validity, exploratory factor analyses using principal component analysis (PCA) indicated a dominant single factor accounting for approximately 40.6% of the total variance. This finding, supported by the inspection of the scree plot, provides evidence for a largely unidimensional structure of the scale.

In terms of discriminant validity, the scale showed strong sensitivity in differentiating individuals with borderline personality disorder from other clinical groups, including major depressive disorder, anxiety disorders, schizophrenia, ADHD, and PTSD, with a median effect size of (d = 1.13). Furthermore, the scale demonstrated moderate sensitivity to therapeutic change, with a pre–post treatment effect size of (d = 0.47).

Overall, these findings provide robust evidence supporting the reliability, validity, and clinical utility of the original version of the scale across different psychological contexts.

3.3. Translation and Adaptation Procedures.

The Arabic version of the I-8 scale has been

adapted in accordance with the international guidelines adopted in translation and cultural adaptation, through an organized process that took place through four successive stages:

(**Forward Translation)**

The original items were translated from English into Arabic by the researcher, and the translated version was then reviewed by bilingual specialists with the aim of ensuring semantic, conceptual and linguistic equivalence with the original tool. Where needed, minor modifications were made to improve the clarity of the clauses, and to ensure that the wording was culturally and clinically appropriate for use in the Saudi context.

(Back-Translation)

A bilingual translator translated the Arabic version back into English independently. The resulting version was then compared to the original scale to detect any differences in meaning. These differences were thoroughly examined and processed to ensure full conceptual equivalence between the two versions.

Expert Review (Content Honesty)

The initial Arabic version was evaluated by a panel of five faculty members from the Department of Psychology at Imam Muhammad Ibn Saud Islamic University. Experts evaluated the clarity of the clauses, their cultural relevance, and the extent to which they were representative of the target psychological construct. Items that achieved a minimum of 70% agreement among the judges were retained in the final version.

3.4. (Pilot Testing)

The initial version was applied to a survey sample of 50 adolescent participants, selected from Ibn Khaldun High School in Riyadh. This phase aimed to examine item clarity and initial psychometric performance within an applied context. All items showed corrected correlation coefficients with the overall score ($r > 0.30$), indicating appropriate efficiency and supporting the scale's applicability to the study's baseline sample.

3.4.1. Ethical Procedures and Considerations

The study received ethical approval from a Saudi university (RCI_REC/21.Feb.2026/7.1.Exp.13) and the Saudi Ministry of Education used the stratified random sampling method to select schools from each of Jeddah's geographical areas, ensuring diverse representation in terms of socio-economic backgrounds. Seven public schools (3 girls' schools and 4 boys' schools) were randomly selected across six neighborhoods. The sample included adolescents between the ages of 15 and 18, who are fluent in Arabic and are currently enrolled in secondary schools, selected in the city of Riyadh. Riyadh was chosen due to its diverse population and multiple socio-economic representations.

School principals and student counselors were first contacted and provided with study information leaflets and approval forms. Among the selected schools, all principals and counselors were approved except for one boys' school in the northern region of Riyadh. Response rates to the electronic questionnaires ranged from 9% to 15%. In the schools where approvals were obtained, the questionnaire was distributed to all enrolled students .

Informed consent was obtained from all participants prior to the start of the questionnaire filling, ensuring that they fully understood the objectives and procedures of the study. Participants were also informed of the guarantee of complete confidentiality, as no personally identifiable information was collected. The data was stored securely, and access to it was only allowed to authorized persons. Students were also informed of their right to withdraw from the study at any time without any consequences, with full commitment to the confidentiality of their responses.

In accordance with ethical, regulatory, contractual, and intellectual property protection requirements, the research data was archived on a secure server of a Saudi university to ensure long-term preservation and to be retained for a minimum of seven years after

3.5. Analytical Strategy

The present study aimed to examine the psychometric properties of the Arabic version of the Short Impulsivity Scale (I-8) within the Saudi context, and to evaluate its validity and reliability among a sample of adolescents. Descriptive statistics were computed, and key psychometric properties were assessed, including internal consistency reliability and construct validity. In addition, the factorial structure of the scale was investigated to determine its structural equivalence within the Saudi cultural context.

To explore the latent structure of the scale, exploratory factor analysis (EFA) was conducted using Principal Components Analysis (PCA) with Varimax (orthogonal) rotation. Factor retention was guided by the Kaiser criterion (eigenvalues > 1), and items were considered acceptable if they exhibited factor loadings of 0.30 or higher.

Subsequently, confirmatory factor analysis (CFA) was performed to validate the factor structure

identified in the EFA. Decisions regarding item retention or removal were based on standardized factor loadings and multiple model fit indices, including the Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Chi-square to degrees of freedom ratio (χ^2/df).

All statistical analyses were conducted using IBM SPSS Statistics for preliminary analyses and EFA, while CFA was performed using AMOS. These analyses were undertaken to estimate reliability coefficients, examine factor structure, and evaluate model fit.

4. RESULTS

4.1. First: Validation of the Scale in the Saudi Context

4.1.1. Face Validity:

The validity of the scale was evaluated through three complementary approaches, beginning with an assessment of face validity. For this purpose, the preliminary version of the scale was examined by five faculty members specializing in psychology at Imam Muhammad Ibn Saud Islamic University. The reviewers were invited to assess each item with respect to linguistic clarity, the comprehensibility of the instructions, the extent to which items appropriately represent their intended dimensions, and their cultural relevance within the Saudi context.

In general, the feedback indicated that the scale items were adequate. All items were retained; however, several were refined through minor linguistic and editorial modifications, in line with the reviewers' recommendations, to improve clarity and precision. The level of agreement among the reviewers ranged from 80% to 100%, reflecting strong consensus and preliminary support for the instrument's face validity. Based on these revisions, a final, refined version of the scale was established, exhibiting enhanced clarity, accuracy, and suitability for both research and applied use.

4.1.2. Construct Validity

A. Exploratory Factor Analysis (EFA)

Construct validity was examined through exploratory factor analysis (EFA), with the aim of identifying the underlying latent structure of the scale and evaluating the extent to which the observed items reflect the intended construct. Prior to conducting the analysis, the adequacy of the data for factor analysis was rigorously assessed.

The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was computed in accordance with established guidelines, whereby values above 0.50 are considered acceptable. The obtained KMO value indicated satisfactory sampling adequacy for factor extraction. Furthermore, Bartlett's Test of Sphericity was statistically significant ($p < .001$), confirming that the correlation matrix was not an identity matrix and that sufficient inter-item correlations existed to justify the application of factor analysis (Tavakol & Wetzel, 2020).

Subsequently, the inter-item correlation matrix of the impulsivity scale was analyzed using data obtained from a sample of adolescents. The factor structure was explored using Principal Components Analysis (PCA), followed by Varimax (orthogonal) rotation to enhance interpretability. Factor retention was guided by the Kaiser criterion (eigenvalues > 1), and items were retained if they exhibited factor loadings of at least 0.30. Additionally, each factor was required to include a minimum of three saliently loading items to ensure structural stability and interpretability.

The results revealed the emergence of a single dominant factor, indicating that the scale is most parsimoniously represented as unidimensional. Although the I-8 is theoretically conceptualized as a multidimensional construct, this finding may be interpreted in light of a higher-order general impulsivity factor that subsumes the shared variance across its four theoretically distinct facets. This interpretation aligns with hierarchical models of personality, in which lower-order traits are organized under broader higher-order dimensions. Table 2 presents the unrotated factor matrix derived from the PCA solution.

To further substantiate the factor structure, maximum likelihood (ML) extraction was performed, yielding a single-factor solution with an eigenvalue of 4.487, accounting for 40.218% of the total variance. Collectively, these findings provide converging evidence supporting the unidimensional representation of the scale within the present sample. Conceptually, the extracted factor was interpreted as reflecting a continuum of Impulsivity versus Behavioral Self-Regulation, ranging from spontaneous, unplanned actions to more controlled, deliberate, and goal-directed behavior.

Factor loadings ranged from -0.488 to 0.920, with most items demonstrating substantial loadings on the latent factor, thereby indicating strong construct representation. Item 4 exhibited the highest loading (0.920), followed by Item 3 (0.856) and Item 6 (0.843), suggesting that these items are particularly central to the definition of the construct.

In contrast, Items 1, 2, 7, and 8 loaded negatively

on the factor. This pattern is most plausibly attributable to reverse-worded item formulations, a commonly employed methodological strategy aimed at reducing acquiescence bias and enhancing response validity.

Communality estimates ranged from 0.239 to 0.847, indicating that a substantial proportion of item variance is explained by the extracted factor. Item 4 demonstrated the highest communality (0.847), whereas Item 1 showed the lowest (0.239); however, this value remains within acceptable limits for exploratory research contexts.

Overall, the observed pattern of factor loadings and communalities suggests that the items coherently converge on a common latent construct while retaining acceptable variability in their contributions. These findings support the retention of all items and provide robust evidence for the construct validity of the scale in its current form, particularly within adolescent populations.

Table 2: Factor Loadings, Communalities, and Uniqueness for the One-Factor ML Solution of the (I-8): (N = 257).

Item Number	Factor	Communalities,
VAR00001	-.488-	.239
VAR00002	-.496-	.246
VAR00003	.856	.732
VAR00004	.920	.847
VAR00005	.705	.497
VAR00006	.843	.710
VAR00007	-.809-	.655
VAR00008	-.750-	.562
	4.487	Eigenvalue:
	%40.218	Explained Variance

Based on the maximum likelihood (ML) factor analysis, a single factor emerged with an eigenvalue of 4.487, explaining 40.218% of the total variance. Taken together, these results provide support for the unidimensional structure of the scale. Conceptually, the extracted factor was interpreted as Impulsivity versus Behavioral Self-Regulation, reflecting a continuum ranging from impulsive tendencies to more deliberate, planned, and self-regulated behavior.

The factor loadings ranged from -0.488 to 0.920, with the majority of items showing relatively strong loadings, suggesting a clear association with the underlying construct. Item 4 recorded the highest loading (0.920), followed by Item 3 (0.856) and Item 6 (0.843), indicating their prominent role in defining the factor.

By contrast, several items (Items 1, 2, 7, and 8) loaded negatively on the factor, which is likely attributable to their reverse-worded format, a commonly used strategy in scale development to minimize response bias.

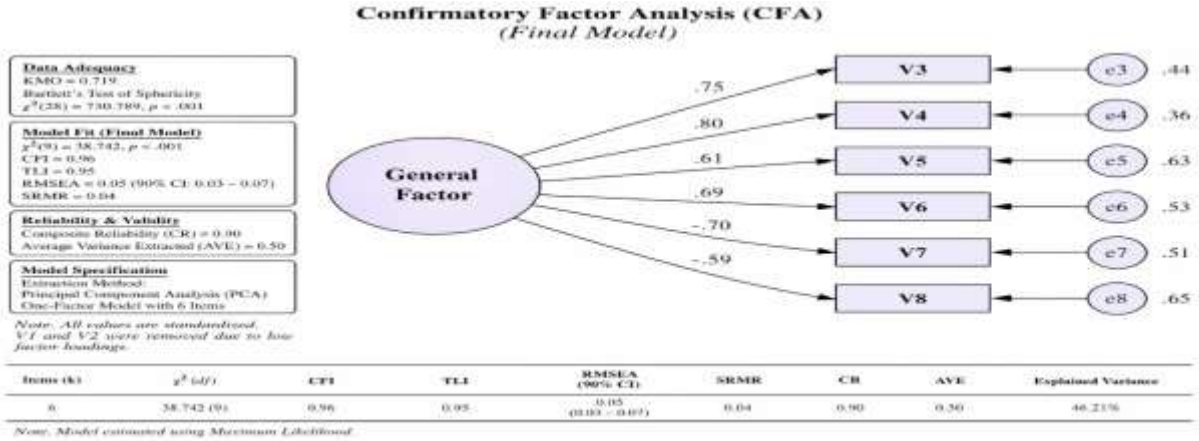
Communalities ranged from 0.239 to 0.847, indicating that a meaningful proportion of variance in each item is accounted for by the extracted factor. Item 4 again showed the highest communality (0.847), while Item 1 had the lowest (0.239), although this value remains acceptable within the context of exploratory analyses.

Overall, the pattern of results suggests that the items contribute in a consistent, though varying, manner to the measurement of the latent construct. This provides further support for retaining the full set of items and offers evidence for the construct validity of the scale in its current form.

4.1.3. Confirmatory Factor Analysis (CFA).

To further assess construct validity, a first-order confirmatory factor analysis (CFA) was conducted on the study sample. The purpose of this analysis was to test the factor structure derived from the exploratory stage and to determine how well the proposed measurement model fits the observed data.

The results of the CFA are reported in Figure 1 .



The figure illustrates the final confirmatory factor analysis (CFA) model of the scale, which can be interpreted as a unidimensional structure. Specifically, the model indicates that six items (V3–V8) load on a single latent construct representing the General Factor. The standardized factor loadings range from 0.59 to 0.80, suggesting generally strong relationships between the observed indicators and the underlying construct, with only modest variability in item contributions.

With regard to model fit, the results demonstrate an excellent overall fit to the data. This is supported by multiple fit indices, including CFI = 0.96 and TLI = 0.95, both of which exceed commonly accepted thresholds. In addition, RMSEA = 0.05 (90% CI: 0.03–0.07) falls within the range typically considered to reflect close fit, while SRMR = 0.04 further confirms a good level of model-data correspondence. Collectively, these indices indicate that the hypothesized model adequately represents the observed data structure.

In terms of reliability and convergent validity, the model also shows strong psychometric performance. The composite reliability (CR = 0.90) reflects high internal consistency among the items, while the average variance extracted (AVE = 0.50) meets the recommended minimum criterion, indicating that the latent factor explains an acceptable proportion of variance in the indicators.

It is also noted that items V6, V7, and V8 display negative factor loadings. This pattern is expected given that these items are reverse-worded, and it does not necessarily indicate poor item performance, provided that reverse scoring has been correctly applied during analysis.

Overall, the final CFA model supports a clear and stable unidimensional structure, with strong model fit, satisfactory reliability, and adequate convergent validity. These findings collectively provide solid evidence for the suitability of the scale for both research and applied psychological assessment contexts.

4.2. Reliability of the Scale in the Saudi Context

The reliability of the Short Impulsivity Scale (Saudi version) was examined using Cronbach's alpha, along with the split-half method, based on the study sample. To obtain more precise estimates, the split-half coefficients were adjusted using the Spearman–Brown formula.

Table 3 presents the resulting reliability coefficients for the Saudi sample. Overall, the findings indicate satisfactory internal consistency and support the stability of the scale in this context.

Table (3): Reliability Statistics of the Short Impulsivity Scale (Saudi Version) and Subscales.

Variable	Number of Items	Cronbach's Alpha	Split-Half Reliability	Spearman–Brown Coefficient
Total Scale	8	0.753	0.717	0.783
Urgency	2	0.915	1.000	1.000
Lack of Premeditation	2	0.865	1.000	1.000
Lack of Perseverance	2	0.893	1.000	1.000
Sensation Seeking	2	.915	1.000	1.000

Table (3) summarizes the reliability estimates for the Short Impulsivity Scale (Saudi version) and its subscales, using Cronbach's alpha alongside split-half reliability corrected via the Spearman–Brown formula.

For the overall scale, the results point to a satisfactory level of internal consistency, with Cronbach's alpha recorded at 0.753. This is further supported by the split-half coefficient (0.783), suggesting that the total score demonstrates an acceptable degree of stability.

At the subscale level, the findings are notably strong. All four dimensions—Urgency, Lack of Premeditation, Lack of Perseverance, and Sensation Seeking—show high internal consistency, with Cronbach's alpha values ranging from 0.865 to 0.915. The split-half and Spearman–Brown coefficients for these subscales are uniformly high (1.000), indicating excellent consistency between item halves.

Taken together, these results suggest that while the overall scale demonstrates adequate reliability, the subscales exhibit very strong internal consistency, supporting the robustness of the measure for use in the Saudi context.

The data were deemed suitable for factor analysis, as indicated by the Kaiser–Meyer–Olkin measure (KMO = .719) and Bartlett's test of sphericity, $\chi^2(28) = 730.789$, $p < .001$. A one-factor confirmatory factor analysis (CFA) was then performed. The initial model demonstrated an acceptable level of fit (CFI = .92, TLI = .90, RMSEA = .07, SRMR = .06). Following the removal of two weakly loading items, the modified six-item model showed a marked improvement in model fit, with excellent indices (CFI = .96, TLI = .95, RMSEA = .05, SRMR = .04).

Standardized factor loadings for the final model ranged from .59 to .80. In addition, composite reliability (CR) reached .90, while the average variance extracted (AVE) was .50, providing evidence for both convergent validity and satisfactory internal consistency of the construct.

4.3. Discussion

The present study set out to examine the

psychometric properties of the Arabic version of the Short Impulsivity Scale (I-8) within the Saudi context. Specifically, the study addressed three research questions concerning: (a) the factorial structure of the scale, (b) its construct validity, and (c) its reliability. Overall, the findings provide converging evidence supporting the adequacy of the scale for assessing impulsivity among adolescents in this cultural context.

4.3.1. Factorial Structure

With regard to the first research question, the exploratory factor analysis (EFA) revealed a clear and interpretable structure characterized by a dominant single-factor solution. This suggests that the scale is most parsimoniously represented as unidimensional in the present sample. Although the I-8 is theoretically grounded in a multidimensional framework, this result may reflect the presence of a higher-order general impulsivity factor that accounts for shared variance across its facets.

This interpretation is consistent with hierarchical models of personality structure (McCrae & Costa, 2008) and broader psychometric evidence suggesting that lower-order traits are often subsumed under general higher-order constructs. It also aligns with prior empirical findings indicating that a general impulsivity factor frequently emerges across different populations, even when multidimensional models are theoretically specified (Billieux et al., 2012; Whiteside & Lynam, 2001).

The confirmatory factor analysis (CFA) further reinforced this structure, demonstrating excellent model fit (CFI = 0.96, TLI = 0.95, RMSEA = 0.05, SRMR = 0.04), consistent with recommended cut-off criteria (Hu & Bentler, 1999; Kline, 2016). Taken together, the EFA and CFA results provide robust support for the structural validity of the scale.

4.3.2. Construct Validity

With respect to the second research question, the findings provide strong evidence for construct validity. Convergent validity was supported by substantial standardized factor loadings, indicating strong associations between items and the latent construct, in line with established measurement theory (Brown, 2015).

Further evidence was obtained through Composite Reliability (CR) and Average Variance Extracted (AVE). CR values exceeding 0.70 indicate satisfactory construct reliability, while AVE values approaching or exceeding 0.50 suggest adequate convergent validity (Fornell & Larcker, 1981; Hair et al., 2019). These results indicate that a substantial proportion of variance in the indicators is captured by the latent construct.

Discriminant validity was assessed using the Heterotrait–Monotrait ratio (HTMT), which has been recommended as a superior criterion compared to traditional approaches (Henseler et al., 2015). HTMT values below the conservative threshold (0.85–0.90) indicate adequate discriminant validity, supporting the distinctiveness of the construct.

Negative loadings observed for reverse-worded items are consistent with prior psychometric research indicating method effects associated with item wording (Podsakoff et al., 2003; Kam & Meyer, 2015). When properly reverse-coded, such items do not compromise construct validity.

4.4. Reliability

Regarding the third research question, the scale demonstrated acceptable reliability. Internal consistency, as assessed by Cronbach's alpha, fell within acceptable limits, supporting measurement stability (Nunnally & Bernstein, 1994). Split-half reliability further confirmed the consistency of the scale.

However, slightly lower alpha values at the total scale level may reflect the conceptual breadth of impulsivity as a higher-order construct. This is consistent with psychometric literature indicating that heterogeneous constructs often yield lower internal consistency due to multidimensional content coverage (McNeish, 2018; Raykov, 2001)..

4.5. Cross-Cultural and Theoretical Implications

Importantly, the findings align with cross-cultural validation research suggesting that psychological constructs often retain their factorial structure across cultures while showing minor parameter variation due to linguistic and contextual adaptation (Chen, 2007; Vandenberg & Lance, 2000). Recent studies further support the stability of impulsivity measures across diverse cultural contexts (Billieux et al., 2024), reinforcing the generalizability of the construct.

From a theoretical perspective, the emergence of a general impulsivity factor supports hierarchical conceptualizations of personality and self-regulation (Carver & Connor-Smith, 2010), where impulsive tendencies reflect a broader regulatory system.

5. CONCLUSION

In conclusion, the findings collectively address the study research questions by demonstrating that the Arabic version of the Short Impulsivity Scale (I-8) exhibits a coherent factorial structure, strong

construct validity, and acceptable reliability. These results support its suitability for use in both research and applied psychological assessment within Saudi and Arabic-speaking populations.

Future research should examine measurement invariance across demographic and clinical groups and further investigate predictive validity in relation to behavioral and psychological outcomes, thereby extending the utility of the scale across applied settings.

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