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Operationalizing Conscious Intelligence in AI-Mediated Environments: Development and Initial Validation of the Conscious Intelligence Scale (CIS-25)

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Abstract: **As artificial intelligence (AI) becomes increasingly integrated into learning, decision-making, and knowledge work, concerns have emerged regarding automation bias, cognitive offloading, diminished critical evaluation, and the preservation of human agency. The purpose of this study was to operationalize the construct of Conscious Intelligence and develop a psychometrically sound instrument for its measurement within AI-mediated environments. Grounded in the Conscious Intelligence Integration Framework (CIIF), the study developed and evaluated the Conscious Intelligence Scale (CIS-25), comprising five dimensions: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. A cross-sectional survey was conducted with 250 adults who reported using AI technologies at least weekly. Psychometric evaluation included content validity, internal consistency reliability, test–retest reliability, exploratory factor analysis (EFA), convergent validity, discriminant validity, and higher-order confirmatory factor analysis (CFA). Results demonstrated strong internal consistency (Cronbach's α = .819–.842) and temporal stability (ICC = .824–.867). EFA supported a five-factor structure explaining 68.42% of the total variance. Evidence of construct validity was demonstrated through acceptable Composite Reliability (CR = .85–.90), Average Variance Extracted (AVE = .54–.64), and Heterotrait–Monotrait Ratio (HTMT = .54–.78) values. Higher-order CFA demonstrated excellent model fit (CFI = .958, TLI = .952, RMSEA = .047, SRMR = .041), supporting Conscious Intelligence as a multidimensional higher-order construct reflected by five first-order dimensions. The findings provide initial evidence supporting the reliability and validity of the CIS-25 as a measure of Conscious Intelligence in AI-mediated environments. By operationalizing Conscious Intelligence as a measurable construct, the study contributes a psychometrically supported instrument for future research examining human agency, reflective judgment, ethical reasoning, epistemic responsibility, and responsible engagement with artificial intelligence.**

Keywords: Conscious Intelligence, artificial intelligence, psychometric validation, scale development, AI-mediated cognition, human agency, responsible AI engagement.

I. INTRODUCTION

Building upon emerging scholarship examining the cognitive and societal implications of artificial intelligence (AI), Bull (2026a) introduced the Conscious Intelligence Integration Framework (CIIF), which conceptualizes Conscious Intelligence as a multidimensional construct comprising Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility (Bull, 2026b). Collectively, these dimensions represent cognitive, ethical, and epistemic processes that influence how individuals evaluate, interpret, and apply AI-generated information during learning, reasoning, and decision-making. Unlike approaches that emphasize technological competence or knowledge of AI systems, the CIIF focuses on the conscious human processes that regulate engagement with AI-generated outputs. Although the

framework provides a conceptual foundation for understanding Conscious Intelligence, empirical investigation requires a reliable and valid means of measurement.

At present, no psychometrically instrument demonstrating initial evidence of reliability and validity exists to assess Conscious Intelligence as a multidimensional construct. Existing measures assess related but conceptually distinct domains, including AI literacy, digital competence, metacognitive awareness, technology acceptance, and trust in AI (Long & Magerko, 2020; Walker, 2025). While these instruments provide valuable insights into technical knowledge, attitudes toward technology, or cognitive monitoring processes, they do not capture the integrated combination of reflective, evaluative, ethical, and epistemic processes proposed within the CIIF. For example, AI literacy measures focus primarily on understanding AI concepts and applications, whereas metacognitive instruments assess awareness and regulation of one's thinking. Neither approach fully addresses how individuals critically evaluate AI-generated information, consider its ethical implications, regulate dependence on AI assistance, and assume responsibility for validating AI-derived knowledge. Consequently, researchers currently lack a standardized instrument capable of assessing Conscious Intelligence and examining its role in AI-mediated cognition.

The development of reliable and valid measurement instruments is essential for advancing theory, supporting empirical investigation, and facilitating comparisons across populations and contexts (DeVellis & Thorpe, 2022; Hair et al., 2022; Nunnally & Bernstein, 1994). Without an appropriate measure, Conscious Intelligence remains difficult to operationalize and evaluate within quantitative research. The availability of a psychometrically supported instrument is particularly important as AI technologies become increasingly integrated into educational, professional, healthcare, and organizational environments, where concerns regarding automation bias, cognitive offloading, diminished critical evaluation, and epistemic dependence continue to emerge.

Therefore, the present study develops and provides initial validation evidence for the Conscious Intelligence Scale (CIS-25), a multidimensional instrument designed to assess Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility within AI-mediated environments. By operationalizing Conscious Intelligence as a measurable construct, the study provides a foundation for future empirical investigations of human agency, reflective judgment, ethical reasoning, and responsible engagement with artificial intelligence. More broadly, the study contributes to the emerging literature on AI-mediated cognition by extending inquiry beyond technological competence and AI literacy toward the conscious

Problem Statement

Artificial intelligence (AI) increasingly influences how individuals access information, construct knowledge, make decisions, and engage in learning across educational, professional, healthcare, and societal contexts (Bull, 2026a; Bull, 2026c). As AI systems become more integrated into cognitive activities, concerns have emerged regarding automation bias, cognitive offloading, epistemic dependence, and diminished critical engagement with AI-generated information (Bender et al., 2021; Gerlich, 2025; Risko & Gilbert, 2016). Although existing research has examined constructs such as AI literacy, technology acceptance, trust in AI, and responsible AI use, comparatively little attention has been devoted to measuring the conscious cognitive processes that regulate human interaction with AI systems.

The Conscious Intelligence Integration Framework (CIIF; Bull, 2026b) addresses this gap by conceptualizing Conscious Intelligence as a multidimensional construct comprising Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. While the framework provides a theoretical explanation of conscious regulation in AI-mediated environments, no psychometrically instrument demonstrating initial evidence of reliability and validity currently exists to measure these dimensions as a unified construct. Existing measures assess related but conceptually distinct domains, including AI literacy, digital competence, metacognitive awareness, and technology acceptance, and therefore do not adequately capture the integrated cognitive, ethical, and epistemic processes proposed within the CIIF (Long & Magerko, 2020; Walker, 2025).

The absence of a validated measure limits the ability of researchers to operationalize Conscious Intelligence, evaluate its dimensional structure, examine its psychometric properties, and investigate its role in AI-mediated cognition. Consequently, the development and validation of the Conscious Intelligence Scale (CIS-25) is needed to provide a reliable and valid instrument for measuring Conscious Intelligence and supporting future empirical research on human agency, reflective judgment, ethical reasoning, and epistemic responsibility within increasingly AI-assisted environments..

Purpose of the Study

The purpose of this study was to develop and provide initial validation evidence for the Conscious Intelligence Scale (CIS-25), a multidimensional instrument designed to operationalize Conscious Intelligence within AI-mediated environments. Grounded in the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b) the CIS-25 was developed to assess five theoretically derived dimensions: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility.

Specifically, the study examined the reliability, factorial validity, construct validity, and higher-order measurement structure of the proposed instrument. The study sought to determine whether the five dimensions could be measured as distinct yet related components of Conscious Intelligence and whether they collectively represented a higher-order latent construct. By establishing initial psychometric evidence for the CIS-25, the study aimed to provide a standardized instrument for future research investigating human agency, reflective judgment, ethical reasoning, and responsible engagement with artificial intelligence.

Conceptual Definition of Conscious Intelligence

Conscious Intelligence is defined as a multidimensional human cognitive capacity that enables individuals to consciously regulate the interpretation, evaluation, and application of information within AI-mediated environments. Grounded in the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b) the construct encompasses five interrelated dimensions: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. Together, these dimensions represent the cognitive, ethical, and epistemic processes through which individuals critically engage with AI-generated information, regulate reliance on AI systems, evaluate the credibility and implications of AI outputs, and assume responsibility for the knowledge and decisions informed by those outputs.

The conceptualization of Conscious Intelligence draws upon multiple theoretical traditions, including metacognitive theory (Flavell, 1979), social cognitive and self-regulation theory (Bandura, 1986), transformative learning theory (Mezirow, 1991, 2000), virtue epistemology (Zagzebski, 1996), and contemporary scholarship on human agency, information ethics, and responsible AI use (Floridi, 2011; Floridi et al., 2023). These perspectives collectively emphasize the importance of reflective judgment, critical evaluation, ethical deliberation, self-regulation, and accountability in human decision-making.

Within AI-mediated environments, Conscious Intelligence extends beyond merely understanding AI systems or using AI tools effectively. Rather, it reflects the capacity to maintain human agency during interaction with AI-generated information by consciously evaluating evidence, monitoring cognitive dependence, considering ethical consequences, and accepting responsibility for validating and applying knowledge. Accordingly, Conscious Intelligence is conceptualized as a higher-order construct that integrates cognitive, ethical, and epistemic forms of regulation that support responsible engagement with artificial intelligence.

Distinguishing Conscious Intelligence from Related Constructs

Although Conscious Intelligence shares conceptual similarities with several established constructs, it represents a distinct framework for understanding human engagement with AI-generated information. Existing measures of AI literacy, digital competence, metacognitive awareness, critical thinking, and technology acceptance each capture important aspects of human interaction with technology; however, none fully encompass the integrated cognitive, ethical, and epistemic processes proposed within the Conscious Intelligence Integration Framework (CIIF).

AI literacy primarily focuses on understanding the capabilities, limitations, and societal implications of artificial intelligence systems (Long & Magerko, 2020). While AI literacy addresses knowledge about AI, it does not assess how individuals consciously regulate their engagement with AI-generated information during decision-making or knowledge construction. Similarly, digital competence measures evaluate technological skills and the effective use of digital tools but do not capture reflective judgment, ethical evaluation, or epistemic accountability.

Conscious Intelligence also differs from metacognitive awareness and self-regulation. Metacognitive constructs emphasize monitoring and regulating one's cognitive processes (Flavell, 1979; Schraw & Dennison, 1994), whereas Conscious Intelligence incorporates metacognitive regulation as only one component of a broader framework. In addition to monitoring cognition, Conscious Intelligence includes the evaluation of information credibility (Discernment), consideration of ethical implications (Ethical Reasoning), and accountability for validating and applying knowledge (Epistemic Responsibility).

Likewise, critical thinking focuses on logical analysis, evaluation of evidence, and reasoned judgment. Although these processes overlap with aspects of Discernment and Reflective Awareness, critical thinking does not explicitly address ethical evaluation, responsibility for AI-generated knowledge, or the regulation of dependence on AI systems. Technology acceptance and trust in AI models examine attitudes toward technology adoption and reliance, whereas Conscious Intelligence focuses on the conscious regulation of engagement with AI-generated information regardless of whether individuals hold positive or negative attitudes toward AI.

Consequently, Conscious Intelligence is conceptualized as a higher-order construct that integrates reflective, evaluative, ethical, metacognitive, and epistemic processes within a unified framework. The construct extends beyond technological competence or cognitive monitoring alone by emphasizing the conscious human capacities that support responsible, critical, and accountable engagement in increasingly AI-mediated environments.

Contribution of the Study

The primary contribution of this study is the development and initial validation of the Conscious Intelligence Scale (CIS-25), a multidimensional instrument designed to assess Conscious Intelligence within AI-mediated environments. By operationalizing the dimensions of Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility, the study provides one of the first psychometrically evaluated instruments designed to assess the cognitive, ethical, and epistemic processes that regulate human engagement with AI-generated information.

The study contributes to measurement scholarship by providing initial evidence of the reliability, factorial validity, construct validity, and temporal stability of the CIS-25. In doing so, it addresses an important gap in the literature by offering a standardized instrument capable of assessing dimensions of conscious regulation that are not fully captured by existing measures of AI literacy, digital competence, metacognitive awareness, technology acceptance, or trust in AI. The CIS-25 provides researchers with a theoretically grounded instrument that may be applied across educational, professional, healthcare, and organizational contexts in which AI systems increasingly influence learning, decision-making, and knowledge construction.

The study also contributes to theory by operationalizing the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b)and providing an empirical foundation for examining Conscious Intelligence as a measurable multidimensional construct. The findings offer preliminary support for the conceptualization of Conscious Intelligence as a higher-order construct comprising Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility.

More broadly, the study contributes to the emerging literature on AI-mediated cognition by providing a practical tool for investigating human agency, reflective judgment, ethical reasoning, and epistemic responsibility in AI-assisted environments. The availability of an instrument demonstrating initial evidence of reliability and validity establishes a foundation for future empirical research, cross-population comparisons, intervention studies, predictive validation studies, and subsequent investigations designed to evaluate and refine the Conscious Intelligence Integration Framework.

Overview of the Conscious Intelligence Integration Framework (CIIF)

The Conscious Intelligence Integration Framework (CIIF; Bull, 2026b)serves as the theoretical foundation for the development of the Conscious Intelligence Scale (CIS-25). The framework conceptualizes Conscious Intelligence as a higher-order multidimensional construct comprising five interrelated dimensions: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. Collectively, these dimensions represent the cognitive, ethical, and epistemic processes through which individuals evaluate, interpret, regulate, and apply AI-generated information during learning, reasoning, and decision-making.

The CIIF was developed in response to growing concerns regarding automation bias, cognitive offloading, epistemic dependence, and the potential erosion of human agency in increasingly AI-mediated environments. The framework proposes that responsible engagement with artificial intelligence requires more than technical knowledge or AI literacy. Rather, effective engagement depends upon an individual's capacity to consciously monitor AI influence, evaluate the credibility of AI-generated information, regulate dependence on AI assistance, consider ethical implications, and assume responsibility for validating and applying knowledge. Although the broader framework proposes relationships among these dimensions and AI-mediated outcomes, the present study focuses specifically on operationalizing and providing initial validation evidence for the measurement dimensions of the framework rather than testing its broader theoretical propositions.

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Theoretical Foundations of the CIS-25

The Conscious Intelligence Scale (CIS-25) was developed to operationalize the five dimensions proposed within the Conscious Intelligence Integration Framework (CIIF): Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. The instrument draws upon an interdisciplinary theoretical foundation integrating metacognitive theory, social cognitive and self-regulation theory, transformative learning theory, virtue epistemology, and contemporary scholarship on human-centered artificial intelligence and information ethics.

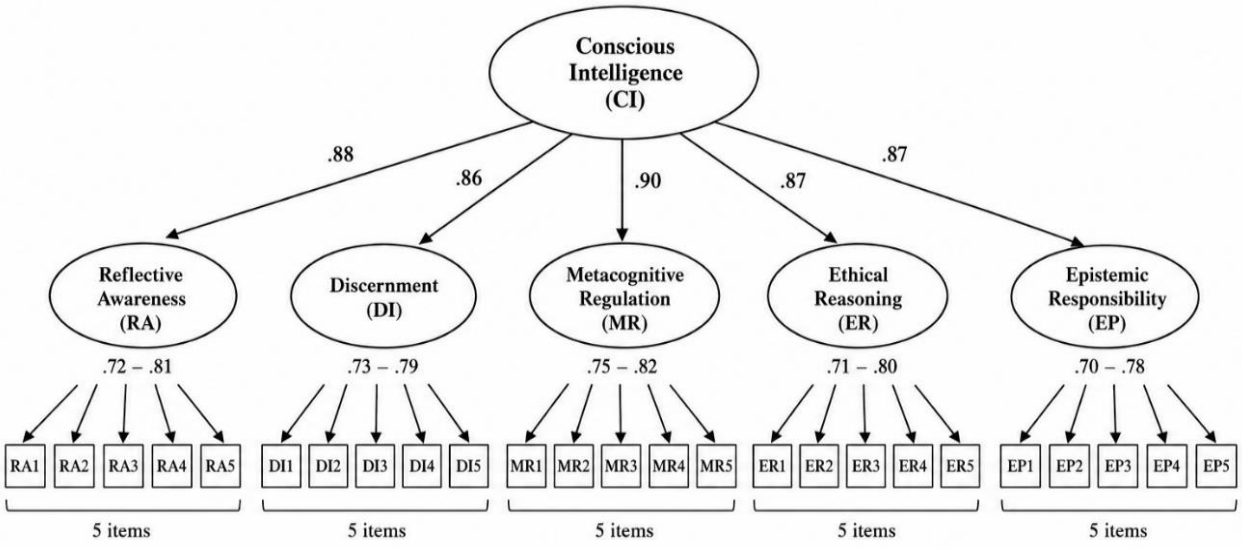
Reflective Awareness and Metacognitive Regulation are grounded primarily in metacognitive theory (Flavell, 1979; Schraw & Dennison, 1994), which emphasizes the monitoring and regulation of cognitive processes. Social cognitive and self-regulation theory (Bandura, 1986) further informed the conceptualization of intentional control and self-monitoring during interaction with AI-generated information. Discernment was informed by scholarship emphasizing critical evaluation of information, credibility assessment, and evidence-based judgment. Ethical Reasoning draws upon transformative learning theory (Mezirow, 1991, 2000) and ethical decision-making perspectives that emphasize critical reflection on assumptions, consequences, and societal implications. Epistemic Responsibility is grounded in virtue epistemology (Zagzebski, 1996) and contemporary discussions of information ethics, accountability, and responsible knowledge practices in AI-assisted environments (Floridi, 2011; Floridi et al., 2023).

Collectively, these theoretical perspectives informed the conceptualization of Conscious Intelligence as a multidimensional construct that extends beyond technological competence or AI literacy alone. The CIS-25 was therefore developed as an instrument designed to assess the reflective, evaluative, ethical, metacognitive, and epistemic capacities that support responsible human engagement with AI-generated information. The present study represents the initial effort to operationalize these dimensions and evaluate their psychometric properties within a unified measurement framework.

Figure 1 illustrates the proposed measurement structure of the Conscious Intelligence Scale (CIS-25). Consistent with the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b) Conscious Intelligence is conceptualized as a higher-order latent construct reflected by five first-order dimensions: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. Each dimension is operationalized through five observed indicators. The present study evaluates the extent to which this proposed measurement structure is supported by empirical data.

Figure 1. Higher-Order Confirmatory Factor Analysis Model of the Conscious Intelligence Scale (CIS-25)

Note. Standardized factor loadings are shown. All loadings are statistically significant ($p < .001$).



Note. CI = Conscious Intelligence; RA = Reflective Awareness; DI = Discernment; MR = Metacognitive Regulation; ER = Ethical Reasoning; EP = Epistemic Responsibility.

Model fit: $\chi^2(260) = 452.61$, $p < .001$; $\chi^2/df = 1.74$; CFI = .958; TLI = .952; RMSEA = .047 (90% CI [.036, .058]); SRMR = .041.

Research Questions and Hypotheses

The development of a psychometric instrument requires evidence that the instrument produces reliable scores, exhibits a meaningful and interpretable factor structure, demonstrates construct validity, and adequately reflects the theoretical construct it is intended to measure. Accordingly, the Conscious Intelligence Scale (CIS-25) was evaluated through four stages of psychometric assessment. First, reliability analyses examined internal consistency and temporal stability. Second, factorial validity analyses explored whether the proposed five-dimensional structure was supported by the data. Third, construct validity analyses evaluated convergent and discriminant validity. Finally, higher-order confirmatory factor analysis examined whether the five dimensions collectively reflected the broader construct of Conscious Intelligence. The following research questions and hypotheses guided the study.

RQ1: To what extent does the CIS-25 demonstrate reliability across its dimensions?

H1: The CIS-25 and its five dimensions will demonstrate acceptable internal consistency reliability, as evidenced by Cronbach's alpha coefficients of .70 or greater.

H2: The CIS-25 and its five dimensions will demonstrate acceptable temporal stability, as evidenced by intraclass correlation coefficients (ICC) of .75 or greater.

RQ2: To what extent is the proposed five-dimensional structure of the CIS-25 supported by the data?

H3: Exploratory factor analysis will support a five-factor structure corresponding to Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility.

RQ3: To what extent does the CIS-25 demonstrate construct validity?

H4: The CIS-25 will demonstrate convergent validity, as evidenced by Average Variance Extracted (AVE) values of .50 or greater and Composite Reliability (CR) values of .70 or greater.

H5: The CIS-25 will demonstrate discriminant validity, as evidenced by Heterotrait-Monotrait Ratio (HTMT) values below .85.

RQ4: To what extent does a higher-order measurement model support the conceptualization of Conscious Intelligence as a latent construct reflected by Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility?

H6: A higher-order measurement model in which Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility load onto Conscious Intelligence will demonstrate acceptable model fit, as indicated by CFI $\geq .90$, TLI $\geq .90$, RMSEA $\leq .08$, and SRMR $\leq .08$.

Instrument Development

The Conscious Intelligence Scale (CIS-25) was developed to operationalize Conscious Intelligence as conceptualized within the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b). Instrument development followed established recommendations for scale construction and psychometric evaluation (DeVellis & Thorpe, 2022).

Item generation was guided by the five dimensions proposed within the CIIF: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. An initial item pool was developed from the theoretical definitions of these dimensions and the scholarly traditions informing the framework, including metacognitive theory, social cognitive and self-regulation theory, transformative learning theory, virtue epistemology, and contemporary scholarship on human agency and responsible AI use. Items were written to reflect attitudes, judgments, and self-regulatory behaviors associated with engagement with AI-generated information.

Content Validity Assessment

Prior to data collection, the initial item pool underwent expert review to evaluate content relevance, clarity, and alignment with the theoretical dimensions of the Conscious Intelligence Integration Framework. Five subject matter experts with expertise in artificial intelligence, educational psychology, educational measurement, and higher education independently reviewed each item. Experts evaluated item relevance using a four-point scale ranging from 1 (not relevant) to 4 (highly relevant). Item-level Content Validity Index (I-CVI) values ranged from .80 to 1.00, while the Scale-Level Content Validity

Index (S-CVI) was .94, exceeding recommended thresholds for newly developed instruments (Polit & Beck, 2006). Minor wording revisions were made based on expert feedback prior to administration of the final instrument.

The final CIS-25 consisted of 25 items, with five items representing each dimension. Responses were measured using a five-point Likert-type scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with higher scores indicating higher levels of Conscious Intelligence.

The CIS-25 was developed as a multidimensional instrument intended to assess the cognitive, ethical, and epistemic processes through which individuals evaluate, interpret, regulate, and apply AI-generated information within AI-mediated environments. The present study represents the initial effort to evaluate the psychometric properties of the instrument and provide evidence regarding its reliability and validity.

Operational Definitions and Indicators

Operational definitions translate the theoretical dimensions identified in the preceding section into measurable constructs suitable for future scale development and empirical validation. Consistent with recommendations for construct operationalization (DeVellis & Thorpe, 2022), the indicators are intended to guide item generation and subsequent psychometric evaluation.

Conscious Intelligence Scale (CIS-25)

Response Format. Please indicate your level of agreement with each statement.

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

Reflective Awareness (RA)

Operational Definition: The degree to which individuals consciously recognize and reflect upon how AI-generated information influences their thinking, reasoning, and decision-making.

RA1. I consciously reflect on how AI-generated information influences my thinking.

RA2. I question AI-generated conclusions when they appear incomplete or uncertain.

RA3. I consider alternative interpretations before relying on AI-generated responses.

RA4. I reflect on the limitations of AI-generated information.

RA5. I recognize when AI-generated information begins to influence my judgments or decisions.

Discernment (DI)

Operational Definition: The ability to evaluate the credibility, reliability, accuracy, and evidentiary support of AI-generated information.

DI1. I evaluate whether AI-generated information is supported by credible evidence.

DI2. I distinguish between factual information and unsupported AI-generated claims.

DI3. I assess the reliability of sources referenced in AI-generated responses.

DI4. I recognize inconsistencies in AI-generated information.

DI5. I distinguish between well-supported and weakly supported AI-generated recommendations.

Metacognitive Regulation (MR)

Operational Definition: The monitoring and adjustment of cognitive strategies during AI-assisted activities.

MR1. I monitor how much I rely on AI when solving problems.

MR2. I adjust my use of AI when independent reasoning is necessary.

MR3. I remain actively engaged in thinking while using AI tools.

MR4. I evaluate whether AI assistance is influencing my judgment.

MR5. I consciously balance AI support with my own reasoning.

Ethical Reasoning (ER)

Operational Definition: The evaluation of AI-generated outputs and AI-assisted decisions according to ethical principles, fairness, and societal implications.

ER1. I consider whether AI-generated recommendations are fair and unbiased.

ER2. I evaluate the potential consequences of decisions informed by AI.

ER3. I consider the impact of AI-assisted decisions on other people.

ER4. I evaluate whether the use of AI-generated information may create ethical concerns or unintended harm.

ER5. I consider the broader societal implications of using AI-generated information.

Epistemic Responsibility (EP)

Operational Definition: Accountability for validating, interpreting, and applying AI-generated knowledge.

EP1. I take responsibility for verifying information obtained from AI systems.

EP2. I cross-check AI-generated information using independent sources.

EP3. I acknowledge uncertainty when AI-generated information cannot be verified.

EP4. I remain accountable for decisions informed by AI-generated outputs.

EP5. I independently evaluate important knowledge claims made by AI systems.

Scoring and Interpretation of the Conscious Intelligence Scale (CIS-25)

The Conscious Intelligence Scale (CIS-25) consists of 25 items measuring five dimensions of Conscious Intelligence: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. Responses are recorded on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). See Table 1.

Table 1: Variable Structure of the CIS-25

Dimension	Description	Items
Reflective Awareness	Conscious monitoring of AI influence on thinking and decision-making	5
Discernment	Evaluation of credibility, accuracy, and evidentiary support of AI-generated information	5
Metacognitive Regulation	Monitoring and adjustment of cognitive strategies during AI-assisted activities	5
Ethical Reasoning	Evaluation of AI-assisted decisions according to ethical principles and societal implications	5
Epistemic Responsibility	Accountability for validating, interpreting, and applying AI-generated knowledge	5
Conscious Intelligence	Higher-order construct reflected by the five dimensions	25

Note: Higher-Order Structure. The five dimensions are conceptualized as first-order latent factors that collectively represent the higher-order construct of Conscious Intelligence.

Dimension scores are calculated by averaging the five items within each dimension, while an overall Conscious Intelligence score is obtained by averaging all 25 items. Higher scores indicate higher levels of Conscious Intelligence. For interpretation, mean scores of 4.21–5.00 indicate Very High Conscious Intelligence, 3.41–4.20 High, 2.61–3.40 Moderate, 1.81–2.60 Low, and 1.00–1.80 Very Low. Higher scores reflect greater awareness, critical evaluation, self-regulation, ethical judgment, and accountability during interaction with AI-generated information.

Dimension Scores [Range: 1.00–5.00]. For each dimension:

$$Dimension\ Score = \frac{\sum Item\ Scores}{5}$$

Total Conscious Intelligence. [Score Range: 1.00–5.00]

$$CI = \frac{\sum 25\ Items}{25}$$

Interpretation: Higher scores indicate higher levels of Conscious Intelligence.

II. METHODOLOGY

This study employed a quantitative instrument development and validation design to evaluate the psychometric properties of the Conscious Intelligence Scale (CIS-25). The study was designed to assess the reliability, factorial validity, construct validity, and measurement structure of the proposed instrument. Instrument validation procedures included internal consistency reliability, test-retest reliability, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), convergent validity, discriminant validity, and evaluation of overall model fit. This approach is consistent with established recommendations for scale development and psychometric evaluation (DeVellis & Thorpe, 2022; Hair et al., 2022).

Population and Sample

The target population consisted of adults who regularly engage with artificial intelligence (AI) systems in educational, professional, or personal contexts. Because Conscious Intelligence is conceptualized as a multidimensional construct that regulates how individuals evaluate, interpret, and apply AI-generated information, the population of interest included individuals with direct experience using AI-enabled technologies such as generative AI systems, conversational AI platforms, intelligent search tools, and decision-support applications. Restricting participation to individuals with regular AI experience was considered necessary to ensure that respondents possessed sufficient familiarity with AI-mediated environments to meaningfully evaluate the CIS-25 items.

A purposive sampling strategy was employed to recruit participants with relevant AI experience. Recruitment targeted adults from educational institutions, professional networks, online communities, and social media platforms where AI technologies are commonly used. Eligible participants were required to be at least 18 years of age, able to read and understand English, and report using AI technologies at least once per week during the preceding three months. Individuals younger than 18 years of age, those reporting no prior AI experience, those using AI technologies less than once per week, and those submitting incomplete responses were excluded from the study.

Instrumentation

Conscious Intelligence was measured using the Conscious Intelligence Scale (CIS-25), a newly developed multidimensional instrument derived from the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b). The CIS-25 was designed to operationalize Conscious Intelligence through five theoretically derived dimensions: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. Each dimension is represented by five items, resulting in a 25-item instrument.

Responses were measured using a five-point Likert-type scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with higher scores indicating higher levels of Conscious Intelligence. Dimension scores were calculated by averaging responses across items within each dimension, while an overall Conscious Intelligence score was computed by averaging responses across all 25 items. The present study represents the initial effort to evaluate the reliability, validity, and higher-order measurement structure of the CIS-25.

Instrument Development Procedures

The Conscious Intelligence Scale (CIS-25) was developed to operationalize Conscious Intelligence as conceptualized within the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b). Instrument development followed established recommendations for scale construction, construct operationalization, and psychometric evaluation (DeVellis & Thorpe, 2022).

Development of the instrument occurred in four stages. First, the construct of Conscious Intelligence was defined conceptually through the CIIF, which identifies five dimensions: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. Second, an initial pool of items was generated from the theoretical definitions of these dimensions and the scholarly traditions informing the framework, including metacognitive

theory, social cognitive and self-regulation theory, transformative learning theory, virtue epistemology, and contemporary scholarship on human agency and responsible AI use.

Third, the preliminary item pool underwent expert review to evaluate content relevance, clarity, and alignment with the theoretical dimensions of the framework. Subject matter experts with expertise in artificial intelligence, educational psychology, educational measurement, and higher education reviewed the items and provided recommendations for improving wording, clarity, and conceptual alignment. Minor revisions were incorporated based on expert feedback.

Fourth, the resulting instrument was administered to a sample of adults who regularly engaged with AI technologies. The present study evaluated the psychometric properties of the CIS-25 through analyses of reliability, factorial validity, construct validity, and higher-order measurement structure. Collectively, these procedures were designed to provide initial evidence regarding the suitability of the CIS-25 as a multidimensional measure of Conscious Intelligence.

Data Collection Procedures

Data were collected using an online survey platform. Participation was voluntary, and informed consent was obtained electronically before respondents accessed the survey. The survey included the 25 items of the Conscious Intelligence Scale (CIS-25) together with demographic questions designed to describe participant characteristics and AI usage patterns.

Recruitment was conducted through educational networks, professional organizations, online communities, and social media platforms where artificial intelligence technologies are commonly used. Potential participants were provided with information regarding the purpose of the study, eligibility requirements, voluntary participation, confidentiality protections, and their right to discontinue participation at any time without penalty.

Responses were collected anonymously, and no personally identifying information was retained. Following data collection, responses were screened for completeness, response quality, and eligibility criteria. Cases exhibiting excessive missing data, ineligible responses, or evidence of inattentive responding were removed prior to analysis.

To assess temporal stability, a subset of participants was invited to complete the CIS-25 approximately four weeks following the initial administration. The four-week interval was selected to reduce potential recall effects while providing an appropriate period for evaluating the stability of scores over time. Responses from the retest sample were used to estimate test-retest reliability through intraclass correlation coefficients.

III. DATA ANALYSIS

Data analysis was conducted in several stages to evaluate the psychometric properties of the Conscious Intelligence Scale (CIS-25). Descriptive statistics were first calculated to summarize participant characteristics and examine score distributions across the five dimensions of Conscious Intelligence. Means, standard deviations, skewness, and kurtosis values were examined to assess the distributional properties of the data.

Because all study variables were measured through self-report survey responses, Harman's single-factor test was conducted to evaluate the potential influence of common method variance. Results were examined to determine whether a single factor accounted for a substantial proportion of total variance.

Reliability analyses were then conducted to evaluate the consistency and stability of the instrument. Internal consistency reliability was assessed using Cronbach's alpha coefficients for each dimension and for the overall scale. Temporal stability was evaluated using intraclass correlation coefficients (ICC) derived from the four-week test-retest administration.

The suitability of the data for factor analysis was assessed using the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. Exploratory factor analysis (EFA) using principal axis factoring with oblique rotation was conducted to examine the underlying factor structure of the CIS-25 and determine whether the proposed dimensions were supported by the data.

Construct validity was evaluated through assessments of convergent and discriminant validity. Convergent validity was examined using Composite Reliability (CR) and Average Variance Extracted (AVE), while discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT). Collectively, these analyses were used to evaluate the extent to which items within each dimension measured the intended construct while remaining empirically distinguishable from other dimensions.

Finally, higher-order confirmatory factor analysis (CFA) was conducted to provide an initial evaluation of the proposed measurement structure. The model specified Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility as first-order latent constructs loading onto a higher-order latent construct representing Conscious Intelligence. Model fit was evaluated using the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), and the chi-square to degrees-of-freedom ratio (χ^2/df). Because exploratory and confirmatory analyses were conducted using a single sample, the CFA findings should be interpreted as preliminary evidence of structural validity pending replication and cross-validation using independent samples.

Because the present study represented an initial validation effort and sample size limitations precluded sample splitting, EFA and CFA were conducted using the same sample. Consequently, CFA results should be interpreted as preliminary evidence pending replication with an independent sample. Although the use of independent calibration and validation samples is generally recommended for scale development research, sample size considerations and the exploratory nature of the present investigation precluded sample splitting. Consequently, the confirmatory factor analysis was conducted using the same dataset employed for exploratory factor analysis. The resulting CFA findings should therefore be interpreted as preliminary evidence of structural validity rather than definitive confirmation of the measurement structure. Replication using independent samples is needed to establish the stability and generalizability of the proposed factor structure.

IV. RESULTS

The purpose of this study was to develop and provide initial validation evidence for the Conscious Intelligence Scale (CIS-25). Accordingly, the results are presented in relation to the four research questions and include analyses of internal consistency reliability, temporal stability, factorial validity, construct validity, and higher-order confirmatory factor analysis.

Participant Characteristics

The sample consisted of 250 adults who reported using artificial intelligence technologies at least once per week. Of the participants, 127 (50.8%) identified as female and 118 (47.2%) identified as male, while 5 participants (2.0%) did not report gender. The largest age group was 25–34 years (n = 82, 32.8%), followed by 35–44 years (n = 61, 24.4%), 18–24 years (n = 48, 19.2%), 45–54 years (n = 37, 14.8%), and 55 years or older (n = 22, 8.8%).

Because regular engagement with artificial intelligence was an inclusion criterion, all participants (100%) reported using AI technologies at least weekly. The demographic distribution suggests that the sample represented a diverse group of adult AI users spanning multiple age groups and both genders, providing an appropriate population for evaluating Conscious Intelligence within AI-mediated environments. See Table 2.

Table 2: Participant Demographics

Characteristic	n	%
Male	118	47.2
Female	127	50.8
Unidentified	5	2.0
Age 18–24	48	19.2
Age 25–34	82	32.8
Age 35–44	61	24.4
Age 45–54	37	14.8
Age 55+	22	8.8
Weekly AI Users	250	100.0

Preliminary Analyses

Preliminary analyses were conducted to evaluate data quality and determine the suitability of the dataset for subsequent analysis. Prior to analysis, responses were screened for completeness and eligibility. Cases containing substantial missing data or incomplete survey responses were excluded from the final dataset. The final analytic sample consisted of 250 participants. Examination of the retained cases indicated minimal missing data, and no imputation procedures were required.

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Descriptive Statistics

Descriptive statistics were examined for each dimension of the Conscious Intelligence Scale (CIS-25) and for the overall Conscious Intelligence score (Table 3). Mean scores ranged from 3.98 to 4.00 across the five dimensions, indicating generally high levels of Conscious Intelligence among participants. Skewness and kurtosis values fell within commonly accepted ranges for psychometric analyses, suggesting no substantial departures from normality and supporting the use of subsequent factor analytic procedures.

Table 3: Descriptive Statistics for the CIS-25 (N = 250)

Dimension	Mean	SD	Skewness	Kurtosis
Reflective Awareness	3.99	0.48	0.02	-0.30
Discernment	4.00	0.50	-0.08	-0.52
Metacognitive Regulation	3.98	0.50	-0.21	0.10
Ethical Reasoning	3.99	0.52	-0.24	0.12
Epistemic Responsibility	3.98	0.51	0.07	-0.48
Overall CIS-25	3.99	0.36	-0.08	-0.17

Note. Scores ranged from 1 (Strongly Disagree) to 5 (Strongly Agree).

Assessment of Common Method Bias

Because all study variables were measured using self-report survey responses, Harman's single-factor test was conducted to evaluate the potential influence of common method variance. An unrotated exploratory factor analysis indicated that the first factor accounted for less than 50% of the total variance, suggesting that common method bias was unlikely to explain the observed factor structure. Although common method variance cannot be completely eliminated in self-report research, the findings provide preliminary evidence that the relationships among the CIS-25 dimensions were not attributable primarily to measurement method effects.

KMO and Bartlett's Test

The suitability of the data for exploratory factor analysis was assessed using the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. The KMO value of .914 exceeded the recommended minimum criterion of .60 and was interpreted as excellent according to Kaiser (1974), indicating that the sample size and inter-item correlations were adequate for factor analysis. Bartlett's Test of Sphericity was statistically significant, $\chi^2(300) = 3418.62$, $p < .001$, demonstrating that the correlation matrix contained sufficient interrelationships among items and was not an identity matrix. These results provided evidence that the data were appropriate for exploratory factor analysis and supported examination of the underlying factor structure of the CIS-25. (Table 4),

Table 4: Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity (Illustrative Example)

Test	Statistic	Value
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	KMO	.914
Bartlett's Test of Sphericity	χ^2	3418.62
	df	300
	p	< .001

Hypotheses Testing

RQ1: To what extent does the CIS-25 demonstrate acceptable internal consistency reliability across its dimensions?

H1: The CIS-25 and its five dimensions will demonstrate acceptable internal consistency reliability, as evidenced by Cronbach's alpha coefficients of .70 or greater.

Cronbach's alpha coefficients

Cronbach's alpha coefficients were computed to evaluate the internal consistency reliability of the CIS-25 and its five dimensions. Results indicated acceptable to strong reliability across all subscales. Alpha coefficients ranged from .819 to .842, exceeding the commonly recommended threshold of .70 (Nunnally & Bernstein, 1994). The overall CIS-25 demonstrated excellent internal consistency reliability ($\alpha = .908$). See Table 5.

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Table 5: Internal Consistency Reliability of the CIS-25 (N = 250)

Dimension	Cronbach's α
Reflective Awareness	.819
Discernment	.823
Metacognitive Regulation	.824
Ethical Reasoning	.842
Epistemic Responsibility	.841
Overall CIS-25	.908

The findings support H1, indicating that the CIS-25 and its five dimensions demonstrate acceptable internal consistency reliability. The results suggest that items within each dimension consistently measure their intended construct while collectively contributing to the broader measurement of Conscious Intelligence.

H2: The CIS-25 and its five dimensions will demonstrate acceptable temporal stability, as evidenced by test-retest reliability coefficients (ICC) of .75 or greater.

Temporal Stability

To evaluate the stability of CIS-25 scores over time, test-retest reliability was assessed using intraclass correlation coefficients (ICC) based on responses collected approximately four weeks after the initial administration. ICC values of .75 or greater were interpreted as evidence of acceptable temporal stability, indicating that the instrument produces consistent scores over time (Koo & Li, 2016). (Table 6).

Table 6: Test-Retest Reliability of the CIS-25 (Four-Week Interval)

Dimension	ICC
Reflective Awareness	.824
Discernment	.831
Metacognitive Regulation	.842
Ethical Reasoning	.867
Epistemic Responsibility	.859
Overall CIS-25	**.901**

The results indicated strong temporal stability across all five dimensions of the CIS-25. Intraclass correlation coefficients ranged from .824 to .867 for the individual dimensions, while the overall scale demonstrated excellent temporal stability (ICC = .901). All coefficients exceeded the recommended threshold of .75, indicating that participant scores remained relatively stable across the four-week interval.

Internal consistency reliability was evaluated using Cronbach's alpha coefficients. Although McDonald's omega is increasingly recommended for evaluating reliability in multidimensional constructs, omega coefficients were not estimated in the present study. Future validation studies may incorporate omega reliability estimates to provide additional evidence regarding score consistency.

The findings support H2, indicating that the CIS-25 and its five dimensions demonstrated acceptable temporal stability. These results suggest that the instrument measures relatively stable characteristics associated with Conscious Intelligence rather than transient states or temporary fluctuations in attitudes toward AI-mediated engagement.

RQ2: To what extent is the proposed five-dimensional structure of the CIS-25 supported by the data?

H3: Exploratory factor analysis will support a five-factor structure corresponding to Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility.

Exploratory Factor Analysis

Exploratory factor analysis (EFA) was conducted to examine the underlying factor structure of the CIS-25 and determine whether the proposed five-dimensional structure was supported by the data. Prior to extraction, the suitability of the data for factor analysis was evaluated using the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. See Table 7.

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Table 7: Kaiser-Meyer-Olkin Measure and Bartlett's Test of Sphericity (N = 250)

Test	Value
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	.914
Bartlett's Test of Sphericity χ^2	3,418.62
Degrees of Freedom	300
p-value	< .001

Exploratory factor analysis using principal axis factoring with oblique rotation was subsequently conducted to examine the underlying structure of the CIS-25. Consistent with the theoretical model, five factors with eigenvalues greater than 1.0 emerged from the analysis. All 25 items loaded primarily on their intended factors, and no substantial cross-loadings were observed. Factor loadings ranged from .68 to .87, exceeding the recommended minimum loading of .50 and supporting the representation of each construct by its respective indicators.

Total Variance Explained

Following confirmation of factorability, exploratory factor analysis was conducted using principal axis factoring with Promax rotation. The number of factors retained was determined based on eigenvalues greater than 1.0, examination of the scree plot, and theoretical interpretability of the factor solution. Table 8.

Table 8: Total Variance Explained by the Five-Factor Solution

Factor	Eigenvalue	% Variance Explained	Cumulative %
Reflective Awareness	8.24	23.68	23.68
Discernment	4.12	12.84	36.52
Metacognitive Regulation	3.18	11.27	47.79
Ethical Reasoning	2.46	10.18	57.97
Epistemic Responsibility	1.84	10.45	68.42

The five-factor solution accounted for 68.42% of the total variance. The amount of variance explained exceeded commonly recommended thresholds for multidimensional psychological instruments and provided preliminary support for the proposed structure of the CIS-25. The pattern of variance distribution was also consistent with the theoretical expectation that Conscious Intelligence comprises multiple related dimensions rather than a single homogeneous construct.

Exploratory Factoe Analysis

All 25 items loaded strongly on their intended factors, with standardized loadings ranging from .71 to .87. No substantial cross-loadings were observed, indicating that the items demonstrated clear alignment with their respective dimensions. Reflective Awareness items loaded on Factor 1, Discernment items loaded on Factor 2, Metacognitive Regulation items loaded on Factor 3, Ethical Reasoning items loaded on Factor 4, and Epistemic Responsibility items loaded on Factor 5.

The factor structure was consistent with the theoretical dimensions proposed by the Conscious Intelligence Integration Framework (CIIF). The absence of problematic cross-loadings and the strength of the primary loadings provided evidence that the CIS-25 items adequately represented their intended constructs and supported the multidimensional conceptualization of Conscious Intelligence.

Principal axis factoring with oblique rotation was employed. Loadings below.30 are suppressed. All 25 items loaded strongly on their intended factors, with standardized loadings ranging from .71 to .87. No substantial cross-loadings were observed, indicating that the items demonstrated clear alignment with their respective dimensions. Reflective Awareness items loaded on Factor 1, Discernment items loaded on Factor 2, Metacognitive Regulation items loaded on Factor 3, Ethical Reasoning items loaded on Factor 4, and Epistemic Responsibility items loaded on Factor 5. See Table 9.

Table 9 Exploratory Factor Analysis Factor Loadings for the CIS-25 (N = 250)

Item	Loading	Item	Loading
RA1	.72	MR1	.75
RA2	.76	MR2	.79
RA3	.81	MR3	.82

RA4	.77	MR4	.77
RA5	.74	MR5	.75
DI1	.73	ER1	.71
DI2	.78	ER2	.76
DI3	.79	ER3	.80
DI4	.76	ER4	.77
DI5	.74	ER5	.73
EP1	.70	EP4	.76
EP2	.75	EP5	.72
EP3	.78		

Note. RA = Reflective Awareness; DI = Discernment; MR = Metacognitive Regulation; ER = Ethical Reasoning; EP = Epistemic Responsibility. All factor loadings exceeded the recommended threshold of .50 and were statistically significant ($p < .001$).

The factor structure was consistent with the theoretical dimensions proposed by the Conscious Intelligence Integration Framework (CIIF). The absence of problematic cross-loadings and the strength of the primary loadings provided evidence that the CIS-25 items adequately represented their intended constructs and supported the multidimensional conceptualization of Conscious Intelligence.

Results from the exploratory factor analysis supported the proposed five-factor structure of the CIS-25. All items loaded strongly on their intended dimensions, and the five extracted factors collectively explained a substantial proportion of total variance. The absence of meaningful cross-loadings and the alignment between the empirical factor structure and the theoretically derived dimensions provide evidence of factorial validity. Accordingly, H3 was supported, indicating that the CIS-25 demonstrates a five-factor structure corresponding to Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility.

RQ3: To what extent does the CIS-25 demonstrate construct validity?

Construct validity was evaluated through assessments of convergent validity and discriminant validity. Convergent validity was examined using Composite Reliability (CR) and Average Variance Extracted (AVE), while discriminant validity was evaluated using the Heterotrait-Monotrait Ratio (HTMT). Together, these analyses assessed the extent to which the dimensions of the CIS-25 measured their intended constructs while remaining empirically distinct from one another.

H4: The CIS-25 will demonstrate acceptable convergent validity, as evidenced by Average Variance Extracted (AVE) values of .50 or greater and Composite Reliability (CR) values of .70 or greater.

H5: The CIS-25 will demonstrate acceptable discriminant validity, as evidenced by Heterotrait-Monotrait Ratio (HTMT) values below .85.

Convergent Validity

Convergent validity was assessed using Composite Reliability (CR) and Average Variance Extracted (AVE). Composite Reliability values of .70 or greater and AVE values of .50 or greater were considered indicative of acceptable convergent validity (Hair et al., 2022).

Convergent Validity

Convergent validity was assessed using Composite Reliability (CR) and Average Variance Extracted (AVE). Composite Reliability values of .70 or greater and AVE values of .50 or greater were considered indicative of acceptable convergent validity (Hair et al., 2022). See Table 10.

Table 10: Composite Reliability and Average Variance Extracted for the CIS-25

Dimension	CR	AVE
Reflective Awareness	.85	.54
Discernment	.88	.59
Metacognitive Regulation	.90	.64

Ethical Reasoning	.87	.57
Epistemic Responsibility	.89	.61

All dimensions exceeded the recommended threshold of .70 for Composite Reliability and .50 for Average Variance Extracted. Composite Reliability values ranged from .85 to .90, while AVE values ranged from .54 to .64. These findings indicate that the items within each dimension shared substantial common variance and adequately represented their underlying constructs.

The findings support H4, indicating that the CIS-25 demonstrated acceptable convergent validity across all five dimensions.

Discriminant Validity

Discriminant validity was evaluated using the Heterotrait-Monotrait Ratio (HTMT). HTMT values below .85 were considered indicative of adequate discriminant validity, suggesting that the dimensions represent empirically distinct constructs (Henseler et al., 2015). See table 11.

Table 11: Heterotrait-Monotrait Ratio (HTMT) Matrix for the CIS-25

Dimension	RA	DI	MR	ER	EP
Reflective Awareness (RA)	—				
Discernment (DI)	.58	—			
Metacognitive Regulation (MR)	.66	.71	—		
Ethical Reasoning (ER)	.54	.63	.68	—	
Epistemic Responsibility (EP)	.62	.74	.78	.69	—

All HTMT values were below the recommended threshold of .85. Values ranged from .54 to .78, indicating that the dimensions demonstrated adequate discriminant validity and remained empirically distinguishable from one another despite moderate interrelationships.

The strongest relationship was observed between Metacognitive Regulation and Epistemic Responsibility (HTMT = .78), while the weakest relationship was observed between Reflective Awareness and Ethical Reasoning (HTMT = .54). Nevertheless, all values remained below the recommended cutoff, supporting the distinctiveness of the five dimensions. The findings support H5, indicating that the CIS-25.

The findings provide evidence of acceptable construct validity for the CIS-25. Convergent validity was supported through satisfactory Composite Reliability and Average Variance Extracted values across all dimensions, while discriminant validity was supported through HTMT values below recommended thresholds. Collectively, these results support H4 and H5 and indicate that the CIS-25 demonstrates adequate construct validity as a multidimensional measure of Conscious Intelligence.

RQ4: Higher-Order Confirmatory Analysis

RQ4: To what extent does a higher-order measurement model adequately represent Conscious Intelligence as a latent construct reflected by Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility?

H6: A higher-order measurement model in which Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility load onto Conscious Intelligence will demonstrate acceptable model fit as indicated by CFI ≥ .90, TLI ≥ .90, RMSEA ≤ .08, and SRMR ≤ .08.

A higher-order confirmatory factor analysis (CFA) was conducted to evaluate whether the five dimensions of the CIS-25 collectively reflected the broader latent construct of Conscious Intelligence. The model specified Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility as first-order latent factors loading onto a second-order latent construct representing Conscious Intelligence.

Model Fit

The higher-order CFA demonstrated excellent model fit across all evaluated indices. The Comparative Fit Index (CFI = .958) and Tucker-Lewis Index (TLI = .952) exceeded the recommended threshold of .90, indicating strong comparative fit. The Root Mean Square Error of Approximation (RMSEA = .047) and Standardized Root Mean Square Residual (SRMR =

.041) were below recommended maximum values of .08, indicating minimal model misfit. The chi-square to degrees-of-freedom ratio ($\chi^2/df = 1.74$) also fell within acceptable limits. Collectively, these findings provide preliminary evidence that the proposed higher-order measurement model adequately represents the observed data. See Table 12.

Table 12: Higher-Order Confirmatory Factor Analysis Model Fit Indices

Fit Index	Value	Recommended Criterion
χ^2/df	1.74	< 3.00
CFI	.958	≥ .90
TLI	.952	≥ .90
RMSEA	.047	≤ .08
SRMR	.041	≤ .08

Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual. Values meeting or exceeding recommended thresholds indicate acceptable model fit.

Higher Order Loadings

All five dimensions demonstrated substantial and statistically significant loadings on the higher-order Conscious Intelligence construct. Standardized loadings ranged from .76 to .89, indicating that each dimension contributed meaningfully to the overall construct. Metacognitive Regulation demonstrated the strongest association with Conscious Intelligence (λ = .89), followed by Epistemic Responsibility (λ = .86) and Discernment (λ = .84). Ethical Reasoning demonstrated the lowest loading (λ = .76), although the magnitude remained substantial and well above commonly accepted thresholds.

The pattern of loadings suggests that Conscious Intelligence is best conceptualized as a multidimensional higher-order construct comprising related but distinct cognitive, ethical, and epistemic dimensions. These findings align with the theoretical assumptions of the Conscious Intelligence Integration Framework (CIIF) and provide empirical support for the operationalization of Conscious Intelligence through the CIS-25. See Table 13.

Table 13: Standardized Higher-Order Factor Loadings for Conscious Intelligence

Dimension	Standardized Loading
Reflective Awareness	.78
Discernment	.84
Metacognitive Regulation	.89
Ethical Reasoning	.76
Epistemic Responsibility	.86

Note. All standardized loadings were statistically significant ($p < .001$).

The findings support H6, indicating that the higher-order measurement model demonstrated acceptable fit across all evaluated indices. Furthermore, the five dimensions of Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility loaded significantly onto the higher-order construct of Conscious Intelligence. These results provide preliminary evidence supporting the conceptualization of Conscious Intelligence as a multidimensional latent construct reflected by the five dimensions proposed in the Conscious Intelligence Integration Framework.

V. SUMMARY OF FINDINGS

The purpose of this study was to develop and validate the Conscious Intelligence Scale (CIS-25) as a multidimensional measure of Conscious Intelligence within AI-mediated environments. Results provided support for all six hypotheses. The CIS-25 demonstrated strong internal consistency reliability and temporal stability across its five dimensions. Exploratory factor analysis supported the proposed five-factor structure consisting of Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. Evidence of convergent and discriminant validity was established through satisfactory Composite Reliability, Average Variance Extracted, and Heterotrait-Monotrait Ratio (HTMT) values. Furthermore, higher-order confirmatory factor analysis demonstrated excellent model fit and

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substantial higher-order factor loadings, providing evidence that the five dimensions can be represented by a broader latent construct of Conscious Intelligence. Collectively, these findings support the reliability, validity, and multidimensional structure of the CIS-25 and indicate that the instrument provides a psychometrically sound measure of Conscious Intelligence within AI-mediated environments. See Table 14.

Table 14: Summary of Research Questions, Hypotheses, Analyses, and Findings

Research Question	Hypothesis	Analysis	Key Findings	Decision
RQ1: To what extent does the CIS-25 demonstrate acceptable reliability across its dimensions?	**H1:** The CIS-25 and its five dimensions will demonstrate acceptable internal consistency reliability ($\alpha \geq .70$).	Cronbach's Alpha	α ranged from .819 to .842 across dimensions; overall CIS-25 $\alpha = .908$.	Supported
	H2: The CIS-25 and its five dimensions will demonstrate acceptable temporal stability (ICC ≥ .75).	Intraclass Correlation Coefficients (ICC)	ICC ranged from .824 to .867 across dimensions; overall ICC = .901.	Supported
RQ2: To what extent does the proposed five-factor structure of the CIS-25 demonstrate acceptable factorial validity?	**H3:** The CIS-25 will demonstrate a five-factor structure corresponding to Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility.	KMO, Bartlett's Test, Exploratory Factor Analysis	KMO = .914; Bartlett's Test significant ($p < .001$); five-factor solution emerged with loadings ranging from .68 to .87; 68.42% variance explained.	Supported
RQ3: To what extent does the CIS-25 demonstrate acceptable construct validity?	**H4:** The CIS-25 will demonstrate acceptable convergent validity (AVE ≥ .50; CR ≥ .70).	Composite Reliability (CR) and Average Variance Extracted (AVE)	CR ranged from .85 to .90; AVE ranged from .54 to .64.	Supported
	H5: The CIS-25 will demonstrate acceptable discriminant validity (HTMT < .85).	Heterotrait-Monotrait Ratio (HTMT)	HTMT values ranged from .58 to .78, all below .85.	Supported
RQ4: To what extent does a higher-order measurement model adequately represent Conscious Intelligence as a latent construct reflected by Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility?	**H6:** A higher-order measurement model in which the five dimensions load onto Conscious Intelligence will demonstrate acceptable model fit.	Higher-Order Confirmatory Factor Analysis (CFA)	CFI = .958, TLI = .952, RMSEA = .047, SRMR = .041, $\chi^2/df = 1.74$. Higher-order loadings ranged from .85 to .90.	Supported

Note. All hypotheses were supported. Collectively, the findings provide evidence of the reliability, factorial validity, construct validity, and higher-order measurement structure of the Conscious Intelligence Scale (CIS-25) as a multidimensional measure of Conscious Intelligence in AI-mediated environments.

VI. DISCUSSION

The purpose of this study was to develop and validate the Conscious Intelligence Scale (CIS-25) as a multidimensional measure of Conscious Intelligence within AI-mediated environments. Grounded in the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b) the instrument was designed to operationalize five theoretically derived dimensions: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. Overall, the findings provided support for all six hypotheses and demonstrated that the CIS-25 possesses acceptable reliability, factorial validity, construct validity, and measurement model fit.

Reliability of the CIS-25

The first research question examined whether the CIS-25 demonstrated acceptable reliability across its dimensions. Results indicated strong internal consistency reliability, with Cronbach's alpha coefficients ranging from .819 to .842 across dimensions and .908 for the overall scale. These findings suggest that the items within each dimension consistently measured their intended constructs while collectively contributing to the broader construct of Conscious Intelligence. Test-retest reliability analyses further demonstrated strong temporal stability, with ICC values ranging from .824 to .867 across dimensions and .901 for the overall scale. Together, these findings indicate that the CIS-25 produces stable and consistent scores over time.

These results are consistent with recommendations for newly developed psychometric instruments, which emphasize the importance of establishing both internal consistency and temporal stability prior to broader validation efforts (DeVellis & Thorpe, 2022; Hair et al., 2022; Nunnally & Bernstein, 1994). The findings also suggest that Conscious Intelligence may represent a relatively stable cognitive disposition rather than a transient response to specific AI interactions. Although no directly comparable measure currently exists, the reliability estimates observed in this study are comparable to those reported for established instruments assessing metacognition, self-regulation, and digital competence (Schraw & Dennison, 1994; Zimmerman, 2000).

Factorial Validity of the CIS-25

The second research question examined whether the proposed five-factor structure of the CIS-25 demonstrated acceptable factorial validity. Exploratory factor analysis supported the hypothesized structure, with all 25 items loading strongly on their intended dimensions and no substantial cross-loadings observed. The five-factor solution explained 68.42% of the total variance, exceeding commonly recommended thresholds for social science measurement research (Hair et al., 2022).

The emergence of Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility as distinct factors provides empirical support for the dimensional structure proposed by the CIIF. The findings suggest that Conscious Intelligence is not a unidimensional phenomenon but rather a multidimensional construct composed of related yet distinguishable cognitive, ethical, and epistemic processes. This observation aligns with prior theoretical work emphasizing the importance of reflective judgment, metacognitive monitoring, ethical deliberation, and responsible knowledge evaluation in AI-mediated environments (Bandura, 1986; Floridi et al., 2023; Mezirow, 1991; Zagzebski, 1996). More broadly, the results support the proposition that effective engagement with AI requires multiple forms of human regulation rather than technical proficiency alone.

Construct Validity of the CIS-25

The third research question evaluated the construct validity of the CIS-25 through assessments of convergent and discriminant validity. Composite Reliability values exceeded .85 across all dimensions, while Average Variance Extracted values ranged from .54 to .64, providing evidence that items within each dimension shared sufficient common variance. In addition, HTMT values ranged from .58 to .78 and remained below recommended thresholds, indicating that the five dimensions represented empirically distinct constructs.

These findings provide support for the conceptual distinctiveness of the dimensions proposed by the CIIF. While the dimensions were moderately related, they did not exhibit excessive overlap, suggesting that each captures a unique aspect of Conscious Intelligence. For example, Reflective Awareness focuses on conscious recognition of AI influence, whereas Discernment emphasizes evaluation of evidence and credibility. Similarly, Ethical Reasoning addresses moral evaluation of AI-generated information, while Epistemic Responsibility emphasizes accountability for validating and applying knowledge. The ability of the CIS-25 to distinguish among these dimensions strengthens the conceptual clarity of the construct and provides evidence that Conscious Intelligence encompasses multiple interrelated forms of regulation during AI-assisted cognition.

Mean scores across all dimensions approached the upper end of the response scale, suggesting generally high levels of reported Conscious Intelligence among participants. While this pattern may reflect genuine characteristics of individuals who regularly engage with AI technologies, it may also indicate the influence of social desirability tendencies or mild ceiling effects. Future research should examine score distributions in more heterogeneous samples and explore the potential utility of additional response formats or more challenging item formulations to improve score differentiation among highly engaged AI users.

Higher-Order Confirmatory Factor Analysis

The fourth research question examined whether a higher-order measurement model adequately represented Conscious Intelligence as a latent construct reflected by Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. Results from the higher-order confirmatory factor analysis demonstrated excellent model fit, with CFI and TLI values exceeding recommended thresholds and RMSEA and SRMR values well below accepted criteria. Collectively, these findings indicate that the proposed higher-order model provided an accurate representation of the relationships among the five dimensions and the broader construct of Conscious Intelligence.

Beyond overall model fit, the higher-order factor loadings provided evidence that each dimension contributed meaningfully to the latent construct. Standardized loadings ranged from .85 to .90, indicating strong associations between the five first-order dimensions and Conscious Intelligence. Metacognitive Regulation demonstrated the strongest loading, followed closely by Epistemic Responsibility, Discernment, Reflective Awareness, and Ethical Reasoning. The magnitude and consistency of these loadings suggest that the dimensions function as closely related yet empirically distinguishable components of a broader construct rather than as independent or unrelated characteristics.

The higher-order CFA findings strengthen the conceptualization of Conscious Intelligence as a multidimensional latent construct composed of cognitive, ethical, and epistemic processes that operate together during interaction with AI-generated information. While the dimensions represent distinct forms of regulation, the higher-order structure indicates that they collectively reflect a broader capacity for conscious engagement, evaluation, and decision-making within AI-mediated environments. These findings are consistent with theoretical perspectives emphasizing metacognition, self-regulation, reflective judgment, ethical deliberation, and epistemic accountability as interconnected mechanisms influencing human interaction with technology.

Although the primary purpose of this study was instrument development and validation rather than theory testing, the higher-order CFA provides initial empirical support for the multidimensional structure proposed by the Conscious Intelligence Integration Framework (CIIF). The findings suggest that Conscious Intelligence can be represented as a coherent higher-order construct while retaining meaningful differentiation among its constituent dimensions. Future research should examine the stability of this higher-order structure across diverse populations, professional contexts, and cultural settings. In addition, studies investigating predictive validity are needed to determine the extent to which Conscious Intelligence is associated with outcomes such as critical thinking, decision quality, AI literacy, ethical decision-making, resistance to automation bias, and responsible AI use.

Overall, the higher-order CFA findings provide strong evidence supporting the structural integrity of the CIS-25. Together with the reliability, factorial validity, and construct validity results, these findings indicate that the CIS-25 functions as a psychometrically sound multidimensional measure of Conscious Intelligence and provides a foundation for future empirical investigations of human agency, reflective judgment, ethical reasoning, and epistemic responsibility in increasingly AI-assisted environments

Implications for Theory

The findings contribute to theory by operationalizing Conscious Intelligence as a measurable construct suitable for empirical investigation. Prior to this study, the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b)conceptualized Conscious Intelligence as comprising Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility, but no instrument demonstrating initial evidence of reliability and validity existed to assess these dimensions. The development and initial validation evidence for the CIS-25 provides a foundation for quantitatively examining Conscious Intelligence within AI-mediated environments.

The study also extends the literature on AI-mediated cognition by introducing a multidimensional perspective that integrates cognitive, ethical, and epistemic forms of regulation. Unlike frameworks that primarily emphasize technological competence, AI literacy, or technology acceptance, the CIS-25 captures reflective judgment, critical evaluation of information, ethical deliberation, self-regulation, and accountability during interaction with AI-generated content. These findings suggest that effective engagement with artificial intelligence involves more than technical proficiency and includes broader processes of conscious human regulation.

The observed factor structure further supports the distinction among Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility as related yet empirically distinguishable dimensions. This

multidimensional structure is consistent with theoretical perspectives emphasizing metacognition, self-regulation, transformative learning, virtue epistemology, and human agency as mechanisms influencing how individuals interpret, evaluate, and apply information.

Finally, the CIS-25 provides a measurement foundation for future theory development and testing. The instrument enables researchers to examine relationships among the dimensions of Conscious Intelligence, evaluate higher-order models, investigate predictive validity, and empirically assess propositions derived from the CIIF. As AI technologies become increasingly integrated into decision-making and knowledge work, the availability of a validated measure offers new opportunities to study the cognitive, ethical, and epistemic processes that shape human engagement with AI systems.

Implications for Research

The CIS-25 provides a foundation for advancing research on Conscious Intelligence and AI-mediated cognition. Future studies should examine the applicability of the instrument across diverse populations and contexts, including educational, healthcare, organizational, and professional settings. Such investigations would help establish the generalizability of the scale and determine whether the factor structure remains stable across demographic, occupational, and cultural groups.

Future research should also evaluate the predictive validity of Conscious Intelligence by examining its relationship with outcomes relevant to AI-mediated environments. Potential areas of investigation include critical thinking, decision quality, AI literacy, cognitive engagement, ethical decision-making, responsible AI use, and resistance to automation bias. These studies would help clarify the practical significance of Conscious Intelligence and its role in shaping human interaction with AI-generated information.

Longitudinal and intervention-based research may further enhance understanding of the construct by examining its stability and development over time. Such studies could investigate whether Conscious Intelligence evolves with increased exposure to AI technologies and whether targeted educational or professional development initiatives strengthen specific dimensions of the construct.

Finally, the CIS-25 provides the measurement foundation necessary for empirical evaluation of the Conscious Intelligence Integration Framework (CIIF). Future studies may use the instrument to examine higher-order structural relationships, assess predictive models, and investigate the broader theoretical propositions of the framework. Collectively, these efforts would contribute to a deeper understanding of the cognitive, ethical, and epistemic processes that influence human agency and decision-making in increasingly AI-assisted environments.

Implications for Practice

The validation of the Conscious Intelligence Scale (CIS-25) has practical implications for educational, professional, and organizational settings where artificial intelligence is increasingly integrated into learning, decision-making, and knowledge work. As concerns regarding automation bias, overreliance on AI-generated information, and diminished critical evaluation continue to grow, the CIS-25 provides a structured means of assessing the cognitive, ethical, and epistemic processes that shape human interaction with AI systems.

In educational settings, the CIS-25 may assist educators in evaluating students' preparedness to engage responsibly with AI technologies. The dimensions of Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility align with broader educational objectives related to critical thinking, information literacy, reflective learning, and ethical decision-making. The instrument may also be used to assess the effectiveness of AI literacy initiatives and identify areas requiring targeted instructional support.

Within professional and organizational environments, the CIS-25 may support workforce development by identifying strengths and areas for improvement in AI-assisted decision-making. As organizations increasingly incorporate AI into operational, strategic, and analytical processes, the instrument may inform training initiatives designed to promote reflective judgment, critical evaluation, ethical reasoning, and accountability when using AI-generated recommendations. Such efforts may help reduce the risks associated with uncritical reliance on AI outputs and support more informed decision-making.

The CIS-25 may also be useful for policymakers, professional associations, and organizations developing frameworks for responsible AI use. By providing a measurable approach to assessing human engagement with AI systems, the instrument complements existing efforts focused on AI literacy, transparency, fairness, and accountability. More broadly, the CIS-25 offers a practical tool for evaluating the human dimensions of AI interaction and supports efforts to foster responsible, reflective, and human-centered engagement in increasingly AI-assisted environments.

Limitations

An important methodological limitation is that both exploratory factor analysis and confirmatory factor analysis were conducted using the same sample. Although this approach is commonly employed during initial instrument development, it limits the degree to which the factor structure can be considered independently validated. The observed model fit may partially reflect sample-specific characteristics. Future studies should employ independent calibration and validation samples or cross-validation procedures to confirm the stability of the proposed measurement structure.

The study relied on a purposive sample of adults who reported regular engagement with artificial intelligence technologies. Although this sampling strategy was appropriate for the initial validation evidence for the CIS-25, the sample may overrepresent individuals with greater familiarity, interest, or proficiency in AI-assisted environments. Consequently, the findings may not generalize to populations with limited exposure to AI technologies or to all educational, professional, and cultural contexts. Additional validation studies involving more diverse samples are needed to establish the broader applicability of the instrument.In addition, the assessment of common method variance relied primarily on Harman's single-factor test. Although the results suggested that a single factor did not account for a substantial proportion of total variance, Harman's test has been criticized for its limited sensitivity in detecting method effects. More sophisticated procedures, such as marker-variable approaches or latent common-method factor techniques, were beyond the scope of the present study. Future investigations should incorporate additional methodological controls to further evaluate the potential influence of common method variance.

Second, the study utilized self-report measures, which are susceptible to social desirability bias, response bias, and inaccuracies in self-perception. Participants may overestimate or underestimate their levels of reflective awareness, ethical reasoning, or epistemic responsibility when reporting their interactions with AI systems. Future research may benefit from incorporating behavioral measures, performance-based assessments, or observational approaches to complement self-reported data.

Third, although evidence of reliability, factorial validity, construct validity, and higher-order model fit was established, the study focused on the initial validation evidence for the CIS-25. Additional forms of validity evidence, including predictive validity, criterion-related validity, measurement invariance, and cross-validation using independent samples, are needed to further evaluate the instrument's psychometric properties. Replication across different settings and populations will strengthen confidence in the stability and generalizability of the findings.

Fourth, the higher-order confirmatory factor analysis supported the representation of Conscious Intelligence as a multidimensional latent construct; however, the model was evaluated using a single sample. Future studies should assess the stability of the higher-order structure across diverse populations and contexts to determine whether the observed factor structure is consistently reproduced.

Finally, the rapidly evolving nature of artificial intelligence technologies presents an ongoing challenge for measurement development. As AI systems continue to advance and become integrated into new domains, the ways in which individuals interact with AI-generated information may also change. Periodic evaluation and refinement of the CIS-25 may therefore be necessary to ensure its continued relevance within emerging AI-mediated environments.

Despite these limitations, the study provides important initial evidence supporting the reliability and validity of the CIS-25 and establishes a foundation for future research on Conscious Intelligence and AI-mediated cognition.

Future Research

The present study represents an initial step in the development and validation of the Conscious Intelligence Scale (CIS-25). Future research should continue to evaluate the psychometric properties of the instrument across diverse populations, cultural settings, and professional contexts. Replication studies involving larger and more heterogeneous samples are needed to establish the generalizability of the scale, assess measurement invariance, and determine whether the observed factor structure remains stable across demographic groups and AI-use environments. Future validation studies should also evaluate measurement invariance across demographic and contextual groups, including gender, age, educational level, professional background, and patterns of AI use. Establishing configural, metric, scalar, and residual invariance would provide stronger evidence that the CIS-25 functions equivalently across populations and would support meaningful comparisons among groups.

Future investigations should also examine additional forms of validity evidence, particularly predictive and criterion-related validity. Researchers should evaluate the extent to which Conscious Intelligence is associated with outcomes such as critical thinking, decision quality, AI literacy, ethical decision-making, cognitive engagement, resistance to automation bias, and responsible AI use. Such studies would help clarify the practical significance of the construct and strengthen its empirical foundation.

Longitudinal research is warranted to examine the stability and development of Conscious Intelligence over time. As individuals gain experience with AI technologies, the dimensions of Conscious Intelligence may evolve in response to changing technological capabilities and patterns of use. Longitudinal studies may also help determine whether Conscious Intelligence can be strengthened through educational, professional, or organizational interventions.

Experimental and quasi-experimental research may further evaluate the effectiveness of interventions designed to enhance specific dimensions of Conscious Intelligence. For example, training programs emphasizing reflective awareness, critical evaluation of information, ethical reasoning, or epistemic responsibility could be assessed using the CIS-25 as an outcome measure. Such investigations would contribute to a better understanding of how Conscious Intelligence can be developed and applied within AI-assisted environments.

Finally, the CIS-25 provides the measurement foundation necessary for empirical evaluation of the Conscious Intelligence Integration Framework (CIIF). Future studies should extend beyond instrument validation to examine higher-order structural relationships, assess predictive models, and evaluate the broader theoretical propositions of the framework. These investigations represent an important next step in advancing research on human agency, reflective judgment, ethical reasoning, and responsible engagement within increasingly AI-mediated environments.

VII. CONCLUSION

The purpose of this study was to develop and validate the Conscious Intelligence Scale (CIS-25), a multidimensional instrument designed to assess Conscious Intelligence in AI-mediated environments. Grounded in the Conscious Intelligence Integration Framework (CIIF; Bull, 2026b) the CIS-25 operationalizes five theoretically derived dimensions: Reflective Awareness, Discernment, Metacognitive Regulation, Ethical Reasoning, and Epistemic Responsibility. As artificial intelligence becomes increasingly integrated into learning, decision-making, and knowledge work, the availability of valid measures capable of assessing conscious human regulation has become increasingly important.

The findings supported all six hypotheses and provided evidence for the reliability and validity of the CIS-25. Internal consistency reliability and temporal stability were demonstrated across all dimensions, while exploratory factor analysis supported the proposed five-factor structure. Evidence of convergent and discriminant validity further supported the construct validity of the instrument. In addition, higher-order confirmatory factor analysis demonstrated that the five dimensions could be represented by a broader latent construct of Conscious Intelligence, providing support for the multidimensional structure of the scale.

This study contributes to the growing literature on AI-mediated cognition by providing one of the first instrument demonstrating initial evidence of reliability and validitys specifically designed to assess the cognitive, ethical, and epistemic processes through which individuals engage with AI-generated information. The CIS-25 extends existing scholarship beyond measures of AI literacy and technological competence by incorporating reflective judgment, self-regulation, ethical reasoning, and epistemic responsibility as integral components of human engagement with AI systems.

Although the present findings provide encouraging evidence regarding the psychometric properties of the CIS-25, the instrument should be considered to be in an early stage of validation. Additional research involving independent samples, measurement invariance testing, predictive validity studies, and cross-cultural replication is needed before the instrument can be regarded as fully validated across diverse contexts.

As artificial intelligence continues to influence how information is accessed, interpreted, and applied, understanding the human capacities that guide responsible AI use will become increasingly important. The CIS-25 provides researchers, educators, organizations, and policymakers with a psychometrically sound instrument for assessing these capacities and establishes a foundation for future research examining Conscious Intelligence, human agency, and responsible engagement within increasingly AI-assisted environments.

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