

Psychometric Validation of the Indonesian Adolescent Adaptation of the Psychological Inventory of Criminal Thinking Styles

Validasi Psikometri Psychological Inventory of Criminal Thinking Styles Versi Bahasa Indonesia Untuk Remaja

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Abstract

This study addresses the need for culturally valid instruments to assess criminal thinking among adolescents in non-Western contexts. Existing measures, such as the Psychological Inventory of Criminal Thinking Styles (PICTS), have limited applicability for adolescent and cross-cultural populations. This study aimed to adapt PICTS into an adolescent-oriented Indonesian version and evaluate its psychometric properties among Indonesian adolescents. A cross-sectional design was used with 550 adolescents aged 14–18 years recruited from educational and correctional settings. The sample was randomly divided for exploratory factor analysis (EFA; $n = 275$) and confirmatory factor analysis (CFA; $n = 275$). Reliability was assessed using Cronbach's alpha and composite reliability, while validity was evaluated using average variance extracted (AVE), heterotrait-monotrait ratio (HTMT), and correlations with APSD-Y. Results supported a four-factor structure consisting of moral disengagement, executive dysfunction, rationalization, and reflective awareness. The final 29-item model showed acceptable fit ($CFI = .910$, $TLI = .901$, $RMSEA = .039$, $SRMR = .060$), with reliability coefficients ranging from .646 to .858. Concurrent validity was supported by a moderate correlation with APSD-Y scores ($r = .441$, $p < .001$). These findings provide preliminary evidence that the Indonesian adolescent adaptation of PICTS is a culturally relevant instrument for assessing criminal thinking among Indonesian adolescents.

Keywords : Adolescent Delinquency; Criminal Thinking; Psychometric Validation

Abstrak

Penelitian ini dilakukan untuk menjawab kebutuhan akan instrumen yang valid secara budaya dalam mengukur pemikiran kriminal (criminal thinking) pada remaja di konteks non-Barat. Instrumen yang tersedia, seperti Psychological Inventory of Criminal Thinking Styles (PICTS), masih memiliki keterbatasan ketika digunakan pada populasi remaja dan lintas budaya. Oleh karena itu, penelitian ini bertujuan mengadaptasi PICTS ke dalam versi yang sesuai untuk remaja Indonesia serta mengevaluasi karakteristik psikometriknya. Penelitian menggunakan desain potong lintang (cross-sectional) dengan melibatkan 550 remaja berusia 14–18 tahun yang direkrut dari lingkungan pendidikan dan masyarakat. Sampel dibagi secara acak untuk analisis faktor eksploratori (EFA; $n = 275$) dan analisis faktor konfirmatori (CFA; $n = 275$). Reliabilitas dievaluasi menggunakan koefisien alfa Cronbach dan composite reliability, sedangkan validitas dievaluasi melalui average variance extracted (AVE), heterotrait-monotrait ratio (HTMT), dan korelasi dengan APSD-Y. Hasil penelitian mendukung struktur empat faktor yang terdiri atas moral disengagement, executive dysfunction, rationalization, dan reflective awareness. Model akhir yang terdiri dari 29 item menunjukkan kesesuaian model yang memadai ($CFI = .910$, $TLI = .901$, $RMSEA = .039$, $SRMR = .060$), dengan koefisien reliabilitas berkisar antara .646 hingga .858. Validitas konkuren didukung oleh korelasi positif sedang dengan skor APSD-Y ($r = .441$, $p < .001$). Temuan ini memberikan dukungan awal terhadap adaptasi PICTS untuk remaja Indonesia sebagai instrumen yang relevan secara budaya untuk mengukur criminal thinking pada remaja Indonesia.

Kata Kunci : Kenakalan Remaja; Pemikiran Kriminal; Validasi Psikometrik

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INTRODUCTION

Accurate measurement of psychological constructs is essential for ensuring valid interpretation of research findings, particularly in cross-cultural and developmental contexts. Psychological instruments are often developed and validated within specific populations, and their psychometric properties cannot automatically be assumed to generalize across different cultural and developmental groups. Instruments that function well in one context may not adequately capture the same construct in another context characterized by different social norms, cultural meanings, and developmental experiences. Consequently, the use of inadequately adapted instruments may produce biased conclusions, compromise construct validity, and limit both theoretical advancement and the effectiveness of intervention efforts (Beaton et al., 2000; Boateng et al., 2018).

Criminal thinking is widely recognized as a cognitive mechanism underlying antisocial behavior and adolescent delinquency. It involves distorted belief systems, deficits in self-regulation, and evaluative processes that enable or justify rule-violating actions. Empirical studies have shown that these cognitive patterns are closely linked to impulsivity, moral disengagement, and variations in offending behavior (Bakken et al., 2023; Syasyila et al., 2024; Cardwell et al., 2015). Delinquent behavior itself arises from complex interactions between individual characteristics and environmental influences, including peer dynamics, social context, and developmental pathways (Farrington et al., 2016; Cho, 2021). Within this broader perspective, criminal thinking is situated within developmental systems and is closely associated with executive functioning and moral reasoning, both of which continue to develop throughout adolescence (Friedman & Robbins, 2022; Tervo-Clemmens et al., 2023).

Despite its theoretical importance, the measurement of criminal thinking in adolescent populations remains limited. Existing instruments, including the Psychological Inventory of Criminal Thinking Styles (PICTS), were originally developed and validated primarily in Western adult samples (Walters, 1995, 2002) and have been further evaluated in subsequent research (Walters, 2024). Emerging evidence suggests that the structure of criminal thinking may vary across developmental stages, indicating potential differences in how the construct is organized across age groups (Tervo-Clemmens et al., 2023). However, empirical validation of criminal thinking instruments for adolescent populations, particularly in Indonesia, remains scarce.

This limitation becomes more critical in collectivistic cultural contexts such as Indonesia, where behavior is shaped not only by individual cognition but also by social norms, relational expectations, and moral evaluation (Dang et al., 2025; Shek et al., 2020; Kotlaja, 2020). Cultural influences may shape how cognitive distortions and self-regulatory processes are organized and expressed. Without proper validation, the use of instruments developed in different cultural settings may result in inaccurate assessment and misinterpretation. At the same time,

adolescent delinquency remains a significant concern in Indonesia, highlighting the need for culturally appropriate assessment tools (Aazami et al., 2023; Fathoni et al., 2024). Taken together, these issues indicate a critical gap in the literature concerning the lack of culturally validated instruments and the limited understanding of the structural organization of criminal thinking among Indonesian adolescents.

Accordingly, the present study aims to adapt the Psychological Inventory of Criminal Thinking Styles (PICTS) for Indonesian adolescents and evaluate its psychometric properties. In addition, the study examines the underlying factor structure of the adapted instrument using a cross-validated exploratory and confirmatory factor analysis approach. Two research questions guide the investigation: (1) What factor structure best represents the adapted PICTS among Indonesian adolescents? and (2) Does the adapted instrument demonstrate acceptable validity and reliability?

This study contributes to the literature in three ways. First, it provides empirical evidence regarding the psychometric properties of an Indonesian adolescent adaptation of PICTS. Second, it evaluates the dimensional structure of criminal thinking using a cross-validated EFA-CFA framework. Third, it extends current understanding of criminal thinking by integrating developmental and cultural perspectives into its conceptualization as a multidimensional cognitive vulnerability.

RESEARCH METHODS

Study design

A cross-sectional quantitative design was employed to evaluate the psychometric properties of the Indonesian adolescent adaptation of the Psychological Inventory of Criminal Thinking Styles (PICTS; Walters, 1995, 2002) among at-risk adolescents. The adaptation involved cultural translation, developmental modification, expert review, cognitive debriefing, and psychometric refinement to ensure linguistic equivalence, conceptual relevance, cultural sensitivity, and developmental appropriateness.

The study was conducted in three phases: (1) cross-cultural adaptation and content validation, (2) pilot testing and cognitive debriefing, and (3) main psychometric validation.

Procedure

Phase I: cross-cultural adaptation and content validation

Permission to adapt PICTS was obtained from the original author. The adaptation followed established cross-cultural adaptation guidelines, including forward translation, back translation, reconciliation, and expert review to ensure linguistic and conceptual equivalence (Beaton et al., 2000).

Six experts in psychology and psychometrics evaluated the initial 80 items for relevance, clarity, and cultural appropriateness using a four-point scale. Item-level and scale-level Content Validity Index values were calculated following established recommendations (Lynn, 1986; Polit & Beck, 2006). Items were revised based on expert feedback.

Face validity was then assessed through cognitive debriefing with adolescent participants to evaluate clarity, comprehension, and contextual relevance.

Phase II: pilot study

A pilot study was conducted to assess item clarity and response processes. Cognitive debriefing was used to identify comprehension difficulties and ensure consistent item interpretation among adolescents (Boateng et al., 2018; DeVellis, 2021). Abstract or technical terms were simplified into developmentally appropriate wording while maintaining conceptual equivalence, particularly for participants from lower socioeconomic backgrounds (Cruchinho et al., 2024).

Phase III: main study

Participants

A total of 550 adolescents aged 14–18 years were recruited from educational and correctional settings in the Greater Jakarta area. Purposive stratified sampling was used to ensure representation across different levels of behavioral risk.

The sample size exceeded recommended participant-to-item ratios for factor analysis, indicating adequate statistical power (Hair et al., 2019; Kline, 2023). Participation was voluntary, and informed consent was obtained from both participants and their guardians.

Instruments

The instrument was adapted from the Psychological Inventory of Criminal Thinking Styles (PICTS; Walters, 1995, 2002), an 80-item self-report measure assessing multiple dimensions of criminal thinking using a four-point Likert scale. Following cross-cultural adaptation, the instrument was refined through item analysis, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA).

Concurrent validity was assessed using the Antisocial Process Screening Device–Youth Version (APSD-Y; Frick & Hare, 2001), which has been widely used to assess antisocial traits in youth populations.

Data Collection

Data were collected using structured self-report questionnaires administered in supervised group settings across educational and correctional institutions. Participants were informed about the study purpose, confidentiality, and voluntary participation.

Written informed consent was obtained prior to data collection. The average completion time ranged from 20 to 30 minutes. To minimize social desirability bias, anonymity was ensured, and participants were informed that their responses would not affect their institutional status.

Data Analysis

All analyses were conducted using RStudio version 4.5.1 with the lavaan package. The dataset ($N = 550$) was randomly split into two subsamples ($n = 275$ each) for cross-

validation, with one subsample used for exploratory factor analysis (EFA) and the other for confirmatory factor analysis (CFA), to reduce the risk of overfitting (Fokkema & Greiff, 2017).

EFA was conducted using minimum residual (minres) extraction with oblimin rotation, which is appropriate for ordinal Likert-type data and allows for correlated factors (Costello & Osborne, 2005; Watkins, 2018; Osborne et al., 2008).

CFA was performed using maximum likelihood estimation. Model fit was evaluated using multiple indices, including the Comparative Fit Index ($CFI \geq .90$) and Tucker–Lewis Index ($TLI \geq .90$), which indicate acceptable incremental fit, as well as the Root Mean Square Error of Approximation ($RMSEA \leq .08$) and Standardized Root Mean Square Residual ($SRMR \leq .08$), which reflect absolute model fit (Kline, 2023).

Internal consistency reliability was assessed using Cronbach's alpha and composite reliability (CR), following established psychometric guidelines (Nunnally & Bernstein, 1994; Hair et al., 2019). Convergent validity was evaluated using Average Variance Extracted (AVE). Given the exploratory nature of early-stage scale adaptation, convergent validity was interpreted jointly based on AVE and CR values, where adequate CR may compensate for lower AVE values (Hair et al., 2019; Fornell & Larcker, 1981).

Discriminant validity was assessed using the heterotrait–monotrait ratio (HTMT), with values below .85 indicating adequate discriminant validity (Henseler et al., 2015). Concurrent validity was examined using Pearson correlation with APSD-Y scores.

RESEARCH RESULTS

Participant characteristics

The study included 550 Indonesian at-risk adolescents aged 14–18 years ($M = 15.70$, $SD = 1.20$), with a relatively balanced gender distribution (51.5% male, 48.5% female). Participants were recruited from community-based guidance or rehabilitation programs and correctional or institutional settings to capture variation in behavioral risk-related experiences. A majority reported prior offending behavior (62.7%), with non-violent offenses being more prevalent than violent offenses.

The sample also showed variability in socioeconomic status and behavioral indicators, including truancy, school dropout, aggression, and other delinquent activities. This diversity provided a suitable basis for evaluating the psychometric performance of the adapted PICTS items. Detailed demographic and behavioral characteristics are presented in Table 1.

Table 1. Demographic and behavioral characteristics of participants (N = 550)

Variable	Category	n	%
Gender	Male	283	51.5
	Female	267	48.5
Age	Mean (SD)	15.7 (1.2)	
	Range	14– 18	
Recruitment Context	Community-based guidance/rehabilitation context	273	49.6
	Correctional/institutional context	277	50.4
Prior Offense	Yes	345	62.7
	No	205	37.3
Offense Type	Violent	238	43.3
	Non-violent	312	56.7
Economic Status	Very low	13	2.4
	Low	70	12.7
	Moderate	432	78.5
	High	35	6.4

Content validity

Content validity was supported by expert evaluation and cognitive debriefing. The I-CVI values ranged from .80 to 1.00, exceeding the recommended threshold, while the S-CVI/Ave was .94, indicating excellent content validity (Lynn, 1986; Polit & Beck, 2006).

Cognitive debriefing further indicated that items were generally well understood, with only minor linguistic refinements required. These findings suggest that the adapted items retained both conceptual equivalence and contextual relevance within the Indonesian adolescent population.

Construct validity

Initial item screening

Item analysis was conducted using corrected item–total correlations, with a minimum threshold of $r \geq .20$ applied to retain items during the initial screening phase. This relatively lenient criterion was adopted to avoid premature exclusion of items in the early stage of scale development, where content coverage remains a priority (DeVellis, 2021). Based on this criterion, 10 items were removed, resulting in 70 items retained for further analysis.

Exploratory factor analysis

Exploratory factor analysis (EFA) was conducted using minimum residual (minres) extraction with oblimin rotation, given the expected correlations among latent constructs (Costello & Osborne, 2005; Hair et al., 2019). Sampling adequacy was supported by a Kaiser–Meyer–Olkin (KMO) value of .818 and a significant Bartlett's test of sphericity ($\chi^2 = 6424.45$, $df = 190$, $p < .001$), indicating that the data were suitable for factor analysis (Kaiser, 1974).

Factor retention was determined using a combination of parallel analysis and scree plot inspection. Although parallel analysis initially suggested a five-factor solution, a four-factor model was retained based on theoretical interpretability, parsimony, and conceptual coherence. This decision reflects the importance of balancing statistical criteria with theoretical considerations in exploratory factor analysis.

The resulting 40-item solution explained 31.6% of the total variance. While this value may appear modest, it is considered acceptable for complex psychological constructs characterized by multidimensional latent structures and heterogeneous behavioral manifestations (Hair et al., 2019). Factor loadings ranged from .40 to .70, indicating adequate associations with their respective latent constructs. The factor structure and item loadings are presented in Figure 1 and Table 2.

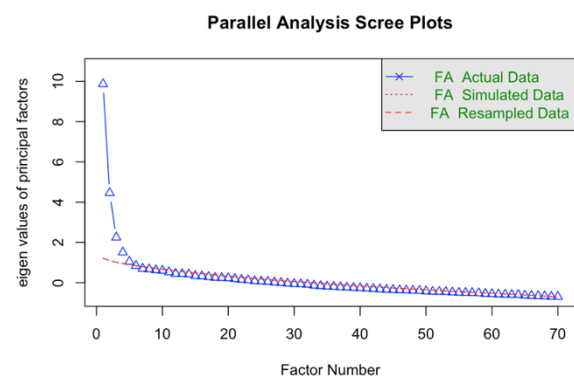


Figure 1. Scree Plot Showing Factor Extraction

Table 2. Variance Explained by the Four-Factor Solution (N = 275)

Factor	SS Loadings	Variance (%)	Cumulative (%)
Moral	6.926	10.8	10.8
Disengagement			
Executive	5.151	8.0	18.9
Dysfunction			
Rationalization	3.046	4.8	23.6
Reflective	1.885	2.9	26.6
Awareness			
Total explained variance			31.6

Factor Loadings and Item Performance

Table 3 presents the factor loadings and corrected item–total correlations for the retained items. Most items demonstrated acceptable corrected item–total correlations ($\geq .30$), supporting internal consistency. A small number of items exhibited marginal corrected item–total correlations. These items were retained to preserve content validity and ensure adequate representation of theoretically important construct domains (DeVellis, 2021). In addition, limited cross-

loadings were observed (e.g., Item C17, C29), but these were retained due to their conceptual relevance and acceptable primary loadings.

Overall, item retention decisions were guided by a balance between statistical criteria and theoretical considerations, ensuring that the resulting factor structure remained both psychometrically sound and conceptually meaningful.

Table 3. Factor Loadings and Item-Total Correlations from Exploratory Factor Analysis (N = 275)

No	Item	F1	F2	F3	F4	r.drop
1	C76	.70	–	–	–	.50
2	C49	.67	–	–	–	.50
3	C33	.66	–	–	–	.47
4	C44	.58	–	–	–	.47
5	C22	.58	–	–	–	.43
6	C57	.57	–	–	–	.39
7	C65	.55	–	–	–	.41
8	C53	.54	–	–	–	.44
9	C78	.54	–	–	–	.41
10	C24	.52	–	–	–	.49
11	C73	.50	–	–	–	.39
12	C15	.50	–	–	–	.31
13	C14	.49	–	–	–	.42
14	C70	.48	–	–	–	.50
15	C35	.48	–	–	–	.46
16	C31	.47	–	–	–	.34
17	C29	.45	–	.32	–	.42
18	C41	.45	–	–	–	.48
19	C52	.45	–	–	–	.31
20	C62	–	.65	–	–	.31
21	C39	–	.63	–	–	.39
22	C36	–	.57	–	–	.34
23	C26	–	.55	–	–	.35
24	C68	–	.53	–	–	.42
25	C51	–	.53	–	–	.34
26	C43	–	.53	–	–	.29
27	C69	–	.48	–	–	.35
28	C4	–	.48	–	–	.21
29	C47	–	.40	–	–	.30
30	C25	–	–	.55	–	.25
31	C77	–	–	.51	–	.04
32	C50	–	–	.50	–	.28
33	C71	–	–	.50	–	.21
34	C80	–	–	.47	–	.25
35	C56	–	–	.42	–	.18
36	C66	–	–	.42	–	.11
37	C67	–	–	.41	–	.24
38	C3	–	–	–	.57	.11
39	C11	–	–	–	.53	.22
40	C64	–	–	–	.48	.02

Note. Factor loadings $\geq .40$ are shown. F1 = Moral Disengagement; F2 = Executive Dysfunction; F3 = Rationalization; F4 = Reflective Awareness. r.drop = corrected item–total correlation.

Confirmatory factor analysis

Confirmatory factor analysis (CFA) was conducted on an independent subsample ($n = 275$) to validate the factor structure identified in the exploratory factor analysis (EFA) and to reduce the risk of overfitting (Fokkema & Greiff, 2017). Model fit was evaluated using multiple indices, including CFI, TLI, RMSEA, and SRMR.

The initial four-factor model demonstrated marginal model fit, with RMSEA and SRMR meeting acceptable thresholds, whereas CFI and TLI fell below recommended cutoff values, indicating the need for model refinement (Kline, 2023). Specifically, CFI (.841) and TLI (.831) fell below the recommended threshold of .90, whereas RMSEA (.045) and SRMR (.067) indicated acceptable fit.

Model respecification was conducted using both statistical and theoretical criteria. Items were considered for removal if they exhibited low standardized factor loadings ($< .40$), substantial cross-loadings, high residual correlations, or conceptual redundancy. Modification indices were examined cautiously, and all changes were implemented only when theoretically justified.

The trimming process was conducted iteratively, with model re-estimation performed after each step. Importantly, this refinement process was conducted on an independent subsample, reducing the likelihood of capitalizing on chance.

The final model consisted of 29 items and demonstrated acceptable fit (CFI = .910, TLI = .901, RMSEA = .039, SRMR = .060), indicating a parsimonious and theoretically coherent representation of the data.

Item Reduction and Model Refinement

Detailed summary of item reduction is presented in Table 4. The initial CFA model was based on the 40-item structure derived from the EFA. Through iterative refinement, a total of 11 items were removed, resulting in a final 29-item model.

Item reduction was not evenly distributed across factors. Factor 1 showed the largest reduction, indicating the presence of overlapping or redundant indicators. Factors 2 and 3 demonstrated moderate reductions, primarily due to low factor loadings and cross-loadings.

Factor 4 was re-specified rather than reduced. The initial indicators did not demonstrate adequate psychometric performance in the CFA model. Therefore, alternative items with stronger empirical loadings and improved conceptual alignment were retained. This re-specification was guided by both statistical criteria and theoretical considerations, suggesting that the original indicators may not have fully captured the construct within the Indonesian adolescent context. Overall, item removal decisions were guided by a balance between statistical criteria (e.g., factor loadings, cross-loadings, and residual correlations) and theoretical considerations, ensuring improved model fit and parsimony without compromising construct validity.

Table 4. Standardized Factor Loadings of the Final CFA Model (N = 275)

Factor	Item	Loading
Moral Disengagement	C14	.639
	C15	.588
	C22	.709
	C24	.621
	C33	.760
	C35	.582
	C44	.718
	C49	.660
	C53	.634
	C65	.533
	C73	.583
	C76	.790
Executive Dysfunction	C78	.741
	C4	.429
	C36	.640
	C39	.683
	C51	.550
	C62	.738
	C68	.724
Rationalization	C69	.578
	C25	.547
	C50	.596
	C56	.399
	C77	.879
Reflective Awareness	C80	.478
	C32	.474
	C58	.809
	C71	.463
	C72	.822

Note. All factor loadings were significant at $p < .001$.

Table 5. Item Reduction Summary from Initial CFA to Final Model

Factor	Initial Items	Final Items	Items Removed	Main Reasons
Moral Disengagement	19	13	6	Cross-loadings, redundancy
Executive Dysfunction	10	7	3	Low loadings
Rationalization	9	5	4	Cross-loadings, residual correlation
Reflective Awareness	3	4	Re-specified	Conceptual refinement

Note. Factor labels were assigned based on theoretical interpretation of item content.

The final model retained four theoretically interpretable dimensions of adolescent criminal thinking. Moral disengagement reflects cognitive tendencies to justify or normalize rule-violating behavior (e.g., “Breaking rules is acceptable as long as no one is harmed”). Executive dysfunction captures difficulties in self-regulation, including

planning and attentional control (e.g., “I often start things enthusiastically but struggle to stay focused until completion”). Rationalization represents self-justifying thought patterns that may reduce perceived guilt (e.g., “Even though I’ve done bad things, I still consider myself a good person”). Reflective awareness reflects evaluative and introspective processes, including awareness of past behavior and consideration of future consequences (e.g., “My life could have been better if I had made better decisions”).

Concurrent validity and reliability

Concurrent validity was assessed by examining the association between scores on the adapted PICTS and the Antisocial Process Screening Device–Youth Version (APSD-Y). Pearson correlation analysis indicated a significant moderate positive relationship ($r = .441$, $p < .001$), supporting the expected theoretical association between criminal thinking and antisocial traits. This finding also supports the nomological validity of the construct, indicating that the adapted PICTS is meaningfully related to an established measure of antisocial behavior.

Internal consistency reliability was evaluated using Cronbach’s alpha (α) and composite reliability (CR). The results are presented in Table 6. Reliability coefficients ranged from .646 to .858. Moral disengagement and executive dysfunction demonstrated good reliability (α and $CR \geq .70$), while rationalization and reflective awareness showed acceptable reliability (α and $CR \geq .60$), consistent with recommendations for early-stage scale adaptation (Hair et al., 2019; Nunnally & Bernstein, 1994).

Table 6. Reliability and Convergent Validity

Construct	Cronbach’s Alpha	CR	AVE
Moral Disengagement	.858	.858	.439
Executive Dysfunction	.783	.783	.395
Rationalization	.646	.646	.363
Reflective Awareness	.671	.671	.442

The relatively lower reliability observed in rationalization and reflective awareness may reflect the abstract and evaluative nature of these constructs, which involve broader conceptual domains and greater heterogeneity. Such patterns are common in multidimensional psychological constructs, particularly during early stages of scale adaptation.

Convergent validity was evaluated using Average Variance Extracted (AVE). Although AVE values were below the recommended threshold of .50, composite reliability values exceeded .60 for all constructs. This pattern is acceptable in early-stage scale development, particularly for complex and multidimensional constructs, where strict AVE thresholds may be overly conservative (Hair et al., 2019). Therefore, the results indicate adequate convergent validity when interpreted in conjunction with composite reliability. Discriminant validity was assessed using the heterotrait–monotrait ratio (HTMT), as presented in Table 7.

Table 7. Discriminant Validity (HTMT)

Construct	1	2	3	4
1. Moral Disengagement	—			
2. Executive Dysfunction	.248	—		
3. Rationalization	.245	.182	—	
4. Reflective Awareness	.250	.155	.500	—

Note. HTMT values below .85 indicate adequate discriminant validity (Henseler et al., 2015).

All HTMT values were below the recommended threshold of .85, indicating adequate discriminant validity (Henseler et al., 2015). These findings demonstrate that the four constructs are empirically distinct despite being theoretically related, supporting the multidimensional structure of criminal thinking as comprising interrelated but separable cognitive processes.

DISCUSSION

Findings from this study provide empirical support for a four-factor model of criminal thinking among Indonesian adolescents, comprising moral disengagement, executive dysfunction, rationalization, and reflective awareness. This structure supports the conceptualization of criminal thinking as a multidimensional construct consisting of interrelated yet distinct cognitive processes. It also suggests that criminal thinking may vary across developmental and cultural contexts, underscoring the importance of context-sensitive measurement approaches.

As an early-stage adaptation, the Indonesian adolescent version of PICTS should not yet be regarded as a finalized or fully standardized measurement scale. The primary objective was to establish a theoretically grounded factor structure and demonstrate its cultural relevance within the Indonesian adolescent context. Further studies are needed to refine the instrument, assess its psychometric robustness across broader populations, and confirm its applicability in diverse settings.

These findings extend prior research by showing that the organization of criminal thinking in adolescents differs from configurations derived from adult Western samples (Walters, 2024). Earlier models emphasized relatively stable cognitive styles, whereas the present findings indicate a more dynamic and developmentally sensitive structure. Such results caution against directly generalizing adult-derived criminal thinking models to adolescent populations, particularly in non-Western cultural contexts where developmental and sociocultural dynamics may reshape cognitive processes. The coexistence of regulatory and evaluative components suggests that criminal thinking reflects an integrated cognitive system rather than isolated distortions, consistent with perspectives highlighting interactions between cognitive, emotional, and behavioral systems in delinquency (Murray et al., 2021; Escrig-Espuig et al., 2023).

Within a broader developmental framework, delinquent behavior can be understood as the result of complex interactions between individual cognitive processes

and environmental influences. Peer dynamics and social context play a central role in shaping adolescent delinquency trajectories (Farrington et al., 2016; Cho, 2021), while criminal thinking and moral disengagement contribute to variability in offending patterns, including severity and persistence (Cardwell et al., 2015). This supports the positioning of criminal thinking as part of a broader developmental system rather than an isolated psychological construct.

Executive dysfunction emerged as a distinct factor, underscoring the role of self-regulatory processes in adolescent delinquency. As executive functions continue to mature during adolescence, limitations in cognitive control may increase susceptibility to impulsive and risk-taking behavior (Friedman & Robbins, 2022; Tervo-Clemmens et al., 2023). Empirical findings also link executive functioning deficits to impaired decision-making and maladaptive behavior in youth populations (Marquez-Ramos et al., 2023; Reynaga et al., 2020). Thus, executive dysfunction may represent a structural component of criminal thinking in adolescence, reflecting developmental immaturity in cognitive control systems.

A notable finding is the distinction between moral disengagement and rationalization, which further highlights the multidimensional nature of cognitive distortions. Moral disengagement operates by neutralizing moral self-sanctions, whereas rationalization reflects post hoc justifications that preserve a positive self-concept (Bandura et al., 1996). Cognitive distortions play an important role in the formation and maintenance of criminal behavior through multiple pathways, including social learning and cognitive-developmental models (Sandra et al., 2026). Empirical studies also show that moral disengagement is associated with antisocial behavior and variability in adolescent offending (Cardwell et al., 2015; Agudelo Rico et al., 2024; Gomez Tabares et al., 2025). Together, these mechanisms indicate a dynamic interplay between moral evaluation and cognitive justification processes.

Reflective awareness emerged as an additional dimension extending existing models of criminal thinking. This construct captures the capacity to evaluate past behavior and anticipate future consequences. Its emergence suggests that criminal thinking in adolescents is not exclusively characterized by maladaptive cognition but may also incorporate adaptive evaluative processes. Developmental processes related to self-awareness and emotional regulation may underlie this dimension (Mertens et al., 2022), providing a more nuanced understanding of criminal cognition.

Differences between these findings and prior PICTS-based studies highlight the combined influence of developmental and cultural factors. Adolescents undergo ongoing cognitive and psychosocial maturation, which may lead to structural differences compared with adult populations. Cultural context further shapes these processes. In collectivistic settings such as Indonesia, behavior is strongly influenced by social norms, relational expectations, and moral evaluation (Dang et al., 2025;

Kotlaja, 2020; Shek et al., 2020). Environmental exposures, including peer and media influences, may also interact with cognitive processes in shaping delinquent behavior (Verheijen et al., 2021). These contextual dynamics reinforce the importance of culturally grounded measurement.

Psychometrically, the Indonesian adolescent adaptation of PICTS demonstrated acceptable reliability and validity. Internal consistency and composite reliability met recommended thresholds. Although AVE values fell below the conventional cutoff, such patterns are common in multidimensional constructs, particularly during early-stage scale development (Hair et al., 2019). Similar patterns have been observed in Indonesian psychological scale development efforts, where AVE values below threshold were tolerated when composite reliability remained adequate and theoretical grounding was strong (Hardiansyah et al., 2025; Hardiansyah et al., 2020). When interpreted alongside composite reliability, the findings support adequate convergent validity. Concurrent validity was evidenced by moderate correlations with APSD-Y scores, indicating alignment with established measures of antisocial behavior. Model refinement through CFA produced a more parsimonious structure with improved fit indices, and item removal enhanced construct clarity.

Taken together, the findings support a shift from static trait-based models toward a more dynamic and context-dependent conceptualization of criminal thinking during adolescence. Practically, the adapted PICTS may serve as an initial screening and psychoeducational tool in educational and correctional settings. Intervention strategies can be tailored to specific cognitive dimensions, such as strengthening self-regulation to address executive dysfunction or targeting cognitive distortions through moral reasoning and cognitive restructuring. Early identification of these cognitive patterns is important given their potential long-term impact on behavioral development (Kwon et al., 2025), and targeted interventions may enhance preventive efforts (Coşkun & Sarıca, 2025).

Several limitations should be acknowledged. The cross-sectional design restricts causal interpretation and prevents assessment of predictive validity, including whether the identified dimensions of criminal thinking can predict later behavioral outcomes. The sample was drawn from a specific geographic region, which may limit generalizability. Measurement invariance across demographic and risk groups was also not examined, limiting conclusions about structural stability across subpopulations.

Reliance on self-report measures may introduce response bias, particularly because criminal thinking is a socially sensitive construct. Responses may be influenced by impression management, denial, minimization, or limited self-awareness. Future research should therefore incorporate longitudinal designs, multi-method assessments, external behavioral indicators, and broader samples to strengthen the validity and applicability of the adapted PICTS.

Further studies should also evaluate test–retest reliability, predictive validity, and measurement invariance. Because this study did not compare adolescents in conflict with the law and adolescents without legal involvement, it remains unclear whether the adapted instrument can distinguish different levels and patterns of criminal thinking across these groups. Further validation is needed before the instrument is used for forensic assessment, group comparison, or intervention planning.

CONCLUSION

This study provides empirical support for the validity and reliability of the Indonesian adolescent adaptation of PICTS, as reflected in a four-factor structure, satisfactory model fit, and adequate internal consistency. The findings indicate that criminal thinking among Indonesian adolescents is a multidimensional construct comprising moral disengagement, executive dysfunction, rationalization, and reflective awareness.

The results suggest that the structure of criminal thinking may be shaped by developmental and sociocultural factors. This underscores the importance of context-sensitive validation in psychological measurement, particularly when adapting instruments originally developed in Western adult populations.

The adapted PICTS may support early identification of cognitive risk factors and inform targeted interventions in educational and correctional settings. Future research should examine predictive validity, test–retest reliability, and measurement invariance across diverse populations to further strengthen the robustness, generalizability, and practical applicability of the instrument.

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ETHICAL CONSIDERATIONS

Ethical approval was obtained from the Research Ethics Committee of Atma Jaya Catholic University of Indonesia (Protocol No. 0011O/III/PPPE.PM. 10.05/12/2024). Participation was voluntary, and all responses were anonymized to ensure confidentiality.

DECLARATION OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article. The views and opinions expressed in this paper are those of the authors and do not represent the official position of their respective institutions.

TRANSPARENCY OF DATA

The data supporting the findings of this study are available from the corresponding author, Lucy Lidiawati Santioso (lucylidiawati@uici.ac.id), upon reasonable request and subject to institutional and ethical restrictions to protect participant confidentiality. The adapted PICTS instrument and scoring procedures may also be made available upon request for research purposes.

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AUTHORS' CONTRIBUTIONS

All authors equally contribute to this study

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