Ed Process Int J

www.edupij.com

ISSN 2147-0901 (Print), 2564-8020 (Online)

EDUCATIONAL PROCESS
INTERNATIONAL JOURNAL

Adaptation and Validation of the IPPA Peer Attachment Subscale among Adolescents: A Study of Secondary School Students in Indonesia

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Research Article

Cite this article: Marini, L., Hendriani, W., & Wulandari, P. Y. (2025). Adaptation and Validation of the IPPA Peer Attachment Subscale among Adolescents: A Study of Secondary School Students in Indonesia. *Educational Process: International Journal, 19,* e2025577. https://doi.org/10.22521/edupij.2025.19.577

Received August 31, 2025
Accepted November 28, 2025

Keywords: Adaptation, Indonesian, peer attachment, secondary school students, validation.

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Abstract

Background/purpose. Peer attachment refers to the quality of adolescents' relationships with peers and plays a critical role in social adjustment and engagement in learning within school environments. Despite its importance, a standardized instrument for measuring this construct has not been available in the Indonesian educational context. Therefore, this study aimed to adapt the Peer Attachment Subscale of the Inventory of Parent and Peer Attachment (IPPA) into the Indonesian language and to evaluate its psychometric properties among secondary school students.

Materials/methods. The adaptation process followed international guidelines for test translation and adaptation through several systematic stages to ensure linguistic and cultural equivalence. The Indonesian version consists of 25 items organized into three subscales: trust, communication, and alienation. Data were collected from secondary school students in Medan, Indonesia. The adapted scale was examined for construct validity and internal consistency.

Results. The findings confirmed that the Indonesian version retained the three-factor structure of the original instrument and demonstrated satisfactory psychometric properties. After analysis, 20 items showed strong validity and reliability, making the adapted scale suitable for assessing students' peer attachment in school environments.

Conclusion. The Indonesian adaptation of the IPPA peer attachment subscale demonstrated sound validity and reliability. The scale can be considered a reliable and culturally appropriate tool for evaluating peer attachment among Indonesian adolescents, particularly within educational settings, and may support research and psychological practice in schools.

1. Introduction

Adolescence is a stage of development that involves many biological, cognitive, social, and emotional changes. An important part of this period is the growing importance of peer relationships, which strongly influence adolescents' daily experiences, especially in educational settings. As they depend less on their parents, adolescents start to build meaningful friendships that become major sources of emotional support, social identity, and behavioral influence (Steinberg & Morris, 2001).

In educational settings, peer attachment has an important role in shaping students' social adjustment, academic involvement, and psychological well-being. Peer attachment refers to the quality of adolescents' relationships with close friends, which usually include trust, open communication, and mutual support (Armsden & Greenberg, 1987). Adolescents with secure and positive peer attachments usually show stronger motivation, greater persistence in learning, and greater resilience when facing academic difficulties (Ryan, 2001; Wentzel, 2005). On the other hand, weak or insecure peer attachment is often related to loneliness, social anxiety, and deviant behavior, which can negatively affect academic performance (Dishion & Tipsord, 2011; La Greca & Harrison, 2005; Laursen & Hartl, 2013; Mounts & Steinberg, 1995).

Because peer relationships play a central role in adolescent development, it is important to measure the quality of peer attachment using reliable psychological instruments. Accurate measurement is important not only for psychological assessment but also for designing school programs that can improve students' social and emotional competence.

The Inventory of Parent and Peer Attachment (IPPA), developed by Armsden and Greenberg (1987), is one of the most commonly used tools for measuring how adolescents form attachments to parents and peers. Based on Bowlby's Attachment Theory, the IPPA assesses three aspects of attachment—trust, communication, and alienation—in both parental and peer relationships. Many studies have shown that the IPPA has strong reliability and theoretical consistency in different cultural contexts (Pednekar & Tung, 2017; Reiner et al., 2017; Tan & Arshat, 2019; D. Zhang & Wang, 2021). Recent validations have also been conducted in non-Western countries such as China, India, Malaysia, and Turkey, demonstrating that the instrument is culturally adaptable (Jewell et al., 2019; Maya et al., 2023; Mo & Chen, 2024).

Although the IPPA has been successfully adapted in several countries, a valid and reliable Indonesian version of its peer attachment subscale is still not available. The existing adaptation in Indonesia only focuses on the parental attachment scale (Safaria et al., 2024). Because Indonesia has collectivistic cultural values and a unique school environment, using the original IPPA directly may not fully reflect adolescents' peer attachment experiences. Therefore, cultural and linguistic adaptation is needed to make sure the concept of peer attachment is properly represented in the Indonesian educational context (International Test Commission, 2018).

Based on these considerations, this study aims to adapt and validate the peer attachment subscale of the IPPA for Indonesian secondary school students. The validation process includes translation steps, expert content evaluation, construct validity testing using confirmatory factor analysis (CFA), and internal reliability testing. The adapted scale is expected to become a reliable and culturally appropriate tool for measuring peer attachment in Indonesian educational settings, helping future studies and programs that support students' mental well-being and academic involvement.

2. Literature Review

Attachment refers to a lasting emotional bond that people form with important others, such as parents, friends, and romantic partners. These bonds appear in different forms at various stages of life and continue to influence individuals throughout their lifespan (Ainsworth et al., 2015; Bowlby, 1982). In early childhood, parents are the main attachment figures. However, from middle childhood

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to late adolescence, this focus gradually shifts toward peers (Freeman & Brown, 2001). As individuals enter early adolescence, they rely more on peers for emotional support, and these relationships become central to their sense of security (Zhong et al., 2014). During this stage, attachment behaviors are often directed toward non-parental figures (Kerns et al., 2006), and close friendships become important sources of guidance and comfort. This period is marked by higher levels of intimacy, mutual understanding, and self-disclosure in peer relationships (Berndt, 2002; Collins & Laursen, 2000). As a result, adolescents begin to move beyond being passive recipients of parental care and start to show care and support for others in their social groups (Allen & Land, 1999). Peer relationships therefore, represent a meaningful form of attachment, serving as adolescents' main source of emotional and social support (Gorrese & Ruggieri, 2012; Lee & Park, 2017), and are known to predict positive outcomes in social, emotional, behavioral, and educational areas (Schoeps et al., 2020; Shao & Kang, 2022).

The Peer Attachment Subscale of the Inventory of Parent and Peer Attachment (IPPA), developed by Armsden and Greenberg (1987), measures adolescents' perceptions of the emotional and cognitive aspects of their peer relationships, including both positive and negative experiences. This instrument emphasizes the degree to which peers provide a sense of psychological security. Based on Bowlby's Attachment Theory, the IPPA defines peer attachment through three connected dimensions: trust, communication, and alienation (Cassidy & Shaver, 2016; Dandona, 2022).

Trust reflects adolescents' belief that their peers are responsive, supportive, and reliable. It shows how emotionally safe and comfortable they feel when sharing personal thoughts and feelings. This dimension is closely related to students' willingness to work together, talk about learning difficulties, and seek help from friends when facing school stress.

Communication refers to the openness, frequency, and meaningfulness of interactions between adolescents and their close friends. It describes how well they can express emotions, discuss personal matters, and take part in constructive conversations. Good peer communication helps students cooperate in group work, participate more actively in class discussions, and build stronger social connections in the school environment.

Alienation, on the other hand, describes emotional distance, feelings of being misunderstood, or disappointment in peer relationships. As a negative form of attachment, higher alienation scores show a lack of peer support and growing emotional separation. These feelings can lead to lower academic involvement, higher social stress, and psychological problems such as anxiety or depression, which may harm learning outcomes.

In summary, the IPPA offers a theory-based and research-supported framework for understanding adolescents' attachment to peers, especially in educational settings. Its multidimensional structure helps teachers, psychologists, and researchers identify relationship patterns that influence students' adjustment, academic participation, and well-being across different cultural contexts.

3. Methodology

This study used a quantitative cross-sectional design to examine the psychometric properties of the Indonesian version of the Inventory of Parent and Peer Attachment (IPPA), focusing on the peer attachment subscale. The cross-sectional design was chosen because it allowed data to be collected at a single point in time from a large number of adolescents, enabling testing of the construct validity and reliability of the adapted instrument.

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3.1. Participants

The target population included junior and senior high school students in Medan, North Sumatra, Indonesia. Participants were selected using a convenience sampling method based on accessibility and school participation. Five schools, both public and private, were involved to ensure a diverse sample. In total, 410 students participated in the study, comprising 245 females (59.8%) and 165 males (40.2%), aged 12-18 years (M = 15.24, SD = 1.73).

The inclusion criteria required that participants (a) were currently enrolled in junior or senior high school, (b) were within the target age range, and (c) provided informed consent along with parental approval. Participants with incomplete responses were excluded from the final analysis.

Table 1. Participants Demographic Characteristics

Category	Early Adolescent	Frequency (%)	Middle Adolescent	Frequency (%)
Gender				
Male	71	42.51	94	38.68
Female	96	57.48	149	61.31
Grade				
VII	57	34.13	0	0
VIII	37	22.15	2	0.823
IX	-	-	-	-
X	71	42.51	119	48.97
XI	2	1.19	122	50.20
XII	-	-	-	-
Education				
Junior High School	94	56.28	2	0.823
Senior High School	73	43.71	241	99.17

3.2. Instrument

This study used the peer attachment subscale of the Inventory of Parent and Peer Attachment (IPPA), originally developed by Armsden and Greenberg (1987). The instrument measures the quality of adolescents' attachment to peers across three dimensions: trust, communication, and alienation. The adapted version consisted of 25 items; each rated on a five-point Likert scale ranging from 1 (almost never or never) to 5 (almost always or always). Higher scores indicate stronger perceived peer attachment in each dimension.

The instructions for completing the scale were as follows:

"This part asks about your feelings about your relationships with your close friends. Please read each statement and circle the one number that tells how true the statement is for you now."

The blueprint of the IPPA peer attachment subscale is presented in the table below.

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Table 2. Blueprint the IPPA Peer Attachment Subscale

Dimension	Favorable	Unfavorable	Total
Peer Trust	6,8,12,13,14,15,19,20,21	5	10
Peer Communication	1,2,3,7,16,17,24,25	-	8
Peer Alienation	4,9,10,11,18,22,23	-	7
Total	24	1	25

3.3. Data Collection

Data were collected using two formats: printed questionnaires and an online survey through Google Forms. The researcher met participants in person to distribute the printed forms and share access to the online version. This dual-format approach was used to include students who did not have mobile phones or were not allowed to bring them to school.

All participants joined the study voluntarily and provided written informed consent before participating. The research instrument received ethical approval from the Research Ethics Committee of the University of Surabaya, under Ethical Clearance Certificate No. 371/KE/V/2024.

3.4. Procedure and Data Analysis

The construct validity of the IPPA Peer Attachment Subscale was tested using Confirmatory Factor Analysis (CFA) with JASP version 0.18.3. CFA is a psychometric method within the Structural Equation Modeling (SEM) framework that focuses on assessing measurement models. It helps systematically evaluate a predefined factor structure by analyzing the relationships between observed indicators, such as test items or behavioral ratings, and the latent variables they represent, while controlling for measurement error (Brown, 2015; Kline, 2023). In this study, CFA was used to examine whether the observed indicators accurately represented the latent constructs defined by the theoretical framework. Since the latent variables were measured through multiple indicators, it was important to test the unidimensionality of each construct to ensure that the items measured a single underlying factor (Brown, 2015).

Several indices were used to assess the model's goodness of fit, comparing the proposed model with the covariance matrix of the observed variables. If the model shows a good fit, it can be accepted; otherwise, it should be rejected. To test model fit, three absolute fit indices were used: Chi-square, the Standardized Root Mean Square Residual (SRMR), the Root Mean Square Error of Approximation (RMSEA), and the Goodness-of-Fit Index (GFI). In addition, two incremental fit indices were used to evaluate model adequacy: the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI).

A satisfactory model fit is usually shown by the following criteria: SRMR ≤ 0.08, RMSEA ≤ 0.08, GFI ≥ 0.90, CFI ≥ 0.90, and TLI ≥ 0.90. Specifically, SRMR and RMSEA values below 0.08 indicate acceptable fit, and values below 0.05 indicate good fit. GFI values above 0.90 show an acceptable fit, and values above 0.95 show a good fit. For CFI and TLI, values above 0.80 are acceptable, and values above 0.90 represent good model fit (Hair et al., 2022; Schumacker & Lomax, 2016).

After confirming that the model met the required fit indices, the researcher assessed convergent validity by examining the standardized factor loadings (SFL) of each item in the IPPA construct. Several model modifications were made to achieve optimal fit. The evaluation of factor loadings followed established standards: values between ±0.30 and ±0.40 are considered the minimum threshold, values of ±0.50 are significant, and values of ±0.70 or higher show that the item strongly represents

the underlying construct. These thresholds may vary depending on the sample size, with a minimum SFL of ±0.35 acceptable for samples of 250 participants, and ±0.30 for samples of 350 or more.

Besides testing validity, the study also assessed reliability using Construct Reliability (CR, also known as Composite Reliability) and Average Variance Extracted (AVE). A CR value between 0.60 and 0.70 is considered acceptable, while an AVE value of 0.50 or higher is recommended to indicate adequate convergent validity (Hair et al., 2022).

The adaptation process of this measurement followed the International Test Commission (ITC) Guidelines for Translating and Adapting Tests (2018). It included six stages: (i) pre-condition, (ii) measuring instrument development, (iii) confirmation, (iv) administration, (v) scoring and interpretation of the measuring instrument, and (vi) documentation. Figure 1 shows the steps taken to adapt and validate the IPPA.

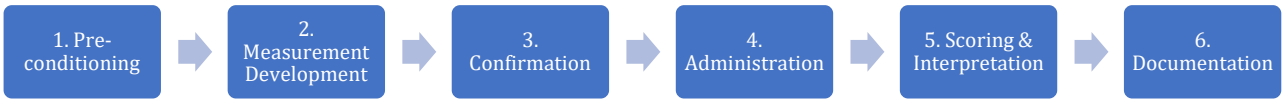

Figure 1. Steps for Adapting the IPPA Peer Attachment Subscale

In the initial pre-condition stage, a comprehensive literature review was conducted to determine the suitability of the Peer Attachment Subscale of the IPPA for the intended target population. Formal permission to translate and adapt the instrument was also obtained from the original authors, who hold the copyright. The second stage, measurement development, began with the selection of three translators and three relevant experts. The translators conducted forward and backward translations and synthesized the results, while the experts conducted both qualitative and quantitative evaluations to ensure that the adapted instrument maintained the same measurement capability as the original scale, supported by evidence based on test content. They also conducted a pilot study using cognitive interviews with a small sample. The third stage, confirmation, involved testing the adapted instrument. This stage included selecting a sample for the final pilot test and conducting an empirical analysis (CFA) to ensure construct equivalence and assess validity and reliability. In the fourth stage, administration, preparations were made for the test administration process using the culture and language of the target population. In the fifth stage, scale scoring and interpretation, guidelines were developed for scoring and interpreting results in line with the target population's culture. In the final stage, documentation, a written technical report of each change was prepared, including empirical analysis evidence, so that others could use the scale to test different populations.

4. Results

4.1. First Stage: Pre-Condition

The aim of this stage was to obtain the original author's approval to translate the scale into another language. The researcher contacted the developer of the IPPA, Gay Armsden, via email on September 12, 2023, at 10:41 a.m., and received a reply at 10:46 a.m. that day, granting approval for the use of the IPPA and its Indonesian translation in this study.

4.2. Second Stage: Measurement Instrument Development

This stage involved several key steps, outlined as follows. The first step was selecting qualified translators and experts. The candidates were required to have strong English proficiency, academic backgrounds in English and Psychology, professional experience in relevant areas (such as translation, language teaching, psychometrics, or instrument development), and preferably international study experience.

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The second step was the translation process, which emphasized both linguistic accuracy and cultural relevance within the Indonesian context. The procedure began with forward translation, in which two translators independently translated the original English instrument into Indonesian. A third expert then synthesized the two versions into one reconciled draft. This was followed by backward translation, in which two translators independently translated the Indonesian version back into English. Again, a third expert synthesized the two backward translations into one final version.

The forward–backward translation procedure was used to ensure semantic and conceptual equivalence between the original and translated versions of the instrument. The results of this process are summarized in Table 3.

Table 3. Indonesian and English Versions of the IPPA Peer Attachment Subscale

Item	Original	Bahasa Indonesia	Backward Translation
1	I like to get my friend's point of view on things I'm concerned about.	*Saya cenderung meminta pendapat teman-teman tentang hal-hal yang saya khawatirkan*	I like to get my friend's point of view on various things I am concerned about.
2	My friends can tell when I'm upset about something.	*Teman-teman dapat mengetahui saat saya sedang kesal terhadap sesuatu*	My friends know when I am upset about something.
3	When we discuss things, my friends care about my point of view.	*Saat kami mendiskusikan sesuatu, teman-teman mempertimbangkan pendapat saya*	When discussing something, my friends consider my point of view.
4	Talking over my problems with friends makes me feel ashamed orfoolish.	*Saya merasa malu atau bodoh jika membicarakan masalah saya pada teman-teman*	Talking over my problems with my friends makes me feel ashamed or foolish.
5	I wish I had different friends.	*Saya berharap memiliki teman yang berbeda*	I wish I had different friends.
6	My friends understand me.	*Teman-teman memahami saya*	My friends understand me.
7	My friends encourage me to talk about my difficulties.	*Teman-teman mendorong saya untuk mau menceritakan kesulitan saya*	My friends encourage me to talk about my difficulties.
8	My friends accept me as I am.	*Teman-teman menerima saya apa adanya*	My friends accept me for who I am.
9	I feel the need to be in touch with my friends more often.	*Saya merasa perlu untuk lebih sering berinteraksi dengan teman-teman*	I feel the need to interact with my friends more often.
10	My friends don't understand what I'm going through these days.	*Teman-teman tidak mengerti apa yang sedang saya alami akhir-akhir ini*	My friends don't understand what I've been going through lately.
11	I feel alone or apart when I am with my friends.	*Saya merasa kesepian meskipun berada bersama teman-teman*	I feel lonely or alienated when I'm with my friends.

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Item	Original	Bahasa Indonesia	Backward Translation
12	My friends listen to what I have to say	*Teman-teman mendengarkan apa yang saya katakan*	My friends are willing to listen to what I have to say.
13	I feel my friends are good friends.	*Saya merasa teman-teman saya adalah teman yang baik*	I feel my friends are good friends.
14	My friends are fairly easy to talk to.	*Teman-teman saya cukup enak diajak bicara*	My friends are easy to talk to.
15	When I am angry about something, my friends try to be understanding.	*Ketika saya marah terhadap suatu hal, teman-teman berusaha untuk memahaminya*	When I am angry about something, my friends try to understand.
16	My friends help me to understand myself better.	*Teman-teman membantu saya untuk lebih memahami tentang diri saya*	My friends help me to understand myself better.
17	My friends care about how I am feeling.	*Teman-teman peduli dengan apa yang sedang saya rasakan*	My friends care about how I am feeling.
18	I feel angry with my friends.	*Saya merasa marah dengan teman-teman saya*	I feel angry with my friends.
19	I can count on my friends when I need to get something off my chest.	*Saya dapat mengandalkan teman-teman ketika saya butuh untuk melepaskan beban yang menyesakkan dada*	I can rely on my friends when I need to release the burden of troubling thoughts.
20	I trust my friends.	*Saya percaya kepada teman-teman saya*	I trust my friends.
21	My friends respect my feelings.	*Teman-teman menghargai perasaan saya*	My friends appreciate my feelings.
22	I get upset a lot more than my friends know about.	*Perasaan kesal saya sebenarnya lebih besar dari yang diketahui teman-teman*	I feel 'unhappy' more than my friends know
23	It seems as if my friends are irritated with me for no reason.	*Teman-teman merasa kesal dengan saya tanpa alasan yang jelas*	It seems that my friends are irritated with me for no clear reason.
24	I can tell my friends about my problems and troubles.	*Saya dapat bercerita tentang masalah dan kesulitan saya kepada teman-teman*	I can tell my friends about my problems and troubles.
25	If my friends know something is bothering me, they ask me about it.	*Jika teman-teman mengetahui ada sesuatu hal yang mengganggu saya, mereka akan menanyakan nya*	If my friends know something is bothering me, they ask me about it.

The third step was assessing the equivalence of the translated instrument, which three linguistic experts conducted. In this process, the original scale was compared with the backward translation results. The comparison outcomes were presented as mean scores that reflected the degree of language comparability and interpretive similarity between the original and translated versions.

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The experts evaluated the items using a 7-point Likert scale, ranging from (1) *very identical, no language differences or having similar meanings* to (7) *very different in terms of language and meaning*. According to Sperber (2004), a formal review of the translated items is necessary if the mean score exceeds 3. Items with a mean score between 2.5 and 3.0 are considered problematic and should be revised. The comparison results help identify items that differ in language structure or meaning, with preference given to items that convey similar meanings (Sperber, 2004).

The experts found that not all items in the IPPA Peer Attachment Subscale were problematic, as the mean scores for comparability ranged from 1 to 2 (equivalent) and for similarity ranged from 1 to 4, with only 2 items scoring above 2.5 and requiring revision. The only feedback concerned the response options section, where several terms were suggested for replacement with more suitable synonyms: *"almost never"* was replaced with *"never"*, and *"not very often"* was replaced with *"seldom/occasionally"*. In question number 22, the word *"annoyed"* was considered more appropriate than *"upset/not happy"*. Additionally, one sentence structure showed a slightly different meaning. In question number 12, the original statement *"My friends listen to what I have to say"* was translated as *"My friends are willing to listen to what I have to say"*. The detailed results of this equivalence assessment are presented in Table 4.

Table 4. Result of Equivalence Analysis Based on Expert Review
(Sources: Personal Data (2024))

Item	Mean Score		Interpretation
	Comparability	Similarity	
1	1.0	1.6	Equivalent
2	1.0	1.0	Equivalent
3	1.0	1.0	Equivalent
4	1.0	1.0	Equivalent
5	1.0	1.0	Equivalent
6	1.0	1.0	Equivalent
7	1.0	1.0	Equivalent
8	1.0	2.3	Equivalent
9	1.0	1.0	Equivalent
10	2.0	2.3	Equivalent
11	1.3	2.3	Equivalent
12	1.3	2.6	Not Equivalent
13	1.0	1.0	Equivalent
14	1.0	2.0	Equivalent
15	1.3	1.6	Equivalent
16	1.0	1.0	Equivalent
17	1.0	1.0	Equivalent
18	1.0	1.0	Equivalent
19	1.3	1.0	Equivalent

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Item	Mean Score		Interpretation
	Comparability	Similarity	
20	1.0	1.0	Equivalent
21	1.0	1.6	Equivalent
22	2.0	4.0	Not Equivalent
23	1.0	1.0	Equivalent
24	1.0	1.0	Equivalent
25	1.0	1.0	Equivalent

The next step involved three psychology experts validating the scale using an evidence-based test content approach by evaluating the results of the forward translation. Content validity in this study was assessed using an expert panel approach, consisting of three specialists in Child and Adolescent Developmental Psychology, Clinical Psychology, and Psychometrics.

The experts reviewed each item in the instrument to ensure its relevance, clarity, and representativeness of the measured construct. *Relevance* refers to how well an item aligns with its intended construct, *importance* indicates how essential the item is to the construct and research context, and *clarity* reflects how clearly and easily the item can be understood.

Their evaluations were analyzed using the Content Validity Index (CVI), which includes two components: the Item Content Validity Index (I-CVI)—measuring the proportion of experts who rated each item as relevant (scores 3 or 4 on a 4-point scale)—and the Scale Content Validity Index (S-CVI), which represents the average I-CVI score across the entire scale. This process demonstrated the extent to which the items accurately represented the constructs being measured.

The experts rated each item's relevance, importance, and clarity using a 4-point scale ranging from 1 (*very irrelevant, very unimportant, and very unclear*) to 4 (*very relevant, very important, and very clear*) (Epstein et al., 2015).

Following the experts' ratings, a dichotomous scoring system was applied, where values of 1 or 2 were recoded as 0, and values of 3 or 4 were recoded as 1. The Item Content Validity Index (I-CVI) was then calculated by dividing the number of experts who rated an item as 3 or 4 by the total number of experts. The Scale Content Validity Index (S-CVI) was obtained by averaging all I-CVI scores across items.

According to Polit et al. (2007), a CVI agreement value of 1.00 is required when the number of experts is five or fewer, while a value of 0.83 is still acceptable if six or more experts are involved. An item is considered acceptable if its I-CVI is ≥ 0.78, and an S-CVI is considered good if it is ≥ 0.90.

Based on the expert review results, the I-CVI and S-CVI scores for relevance, importance, and clarity were all 1.00. This indicates that all items in this study were suitable for use, showing a very high degree of content validity (Table 5). The perfect agreement among the three experts suggests that each IPPA item has a high level of relevance, importance, and clarity. Similarly, the S-CVI value of 1.00 for all three parameters (Table 6) confirms that each item strongly corresponds with the intended construct and aligns well with the characteristics of the respondent population. The relatively homogeneous nature of the sample may have also contributed to these results. Instrument validation was further refined by retaining only the highest-correlating items, resulting in optimal validity scores. Therefore, this scale demonstrates acceptable content validity.

Table 5. Evaluating the I-CVI of The Indonesian Version of the IPPA Peer Attachment Subscale (Sources: Personal Data (2024))

Item	Relevance	Importance	Clarity	Interpretation
1	1.00	1.00	1.00	Appropriate
2	1.00	1.00	1.00	Appropriate
3	1.00	1.00	1.00	Appropriate
4	1.00	1.00	1.00	Appropriate
5	1.00	1.00	1.00	Appropriate
6	1.00	1.00	1.00	Appropriate
7	1.00	1.00	1.00	Appropriate

Table 6. Evaluating the S-CVI of The Indonesian Version of the IPPA Peer Attachment Subscale (Sources: Personal Data (2024))

Relevance	Importance	Clarity	Interpretation
1.00	1.00	1.00	Good (S-CVI score of ≥ 0.90)

The final step, the cognitive interview, was conducted with 16 adolescent panelists aged 12 to 18 years, all of whom were secondary school students. The interviews were carried out face-to-face in their respective schools using verbal probes, a technique involving a series of questions designed to explore participants' thoughts, experiences, or understanding of a specific topic (Peterson et al., 2017).

Each panelist reviewed each item, indicating their level of comprehension and providing suggestions for improvement based on their interpretation of the content. Five items required revisions—specifically, items 1, 4, 6, 9, and 14. Participants suggested replacing certain words to improve clarity: *"think"* was replaced with *"worry"*, *"tell"* with *"talk"*, *"understand"* with *"conceive"*, *"relate"* with *"interact"*, and *"easy enough"* with *"good enough*". The remaining six items were clearly understood by the participants, indicating that these items were already appropriate for the target population.

4.3. Third Stage: Confirmation and Empirical Analysis

After the Indonesian version of the instrument was completed and ready for use, the next stage was to test its construct validity through CFA to assess the instrument's internal structure. Empirical results demonstrated content validity that met the criteria of a good instrument. This analysis was considered the most appropriate because its calculation eliminated measurement errors from items that reflected the latent constructs (Schumacker & Lomax, 2016). The analysis results using JASP software indicated that the loading factor values for all 25 IPPA items ranged from 0.259 to 0.800. Five items had factor loadings below 0.5, namely items 3, 4, 5, 9, and 23. Hair et al. (2022) stated that the minimum significant Standardized Factor Loading (SFL) value is 0.5; therefore, these five items were removed.

A second round of analysis was then conducted on the remaining 20 IPPA (Peer Attachment Subscale) items. The results showed that all items met the factor loading threshold of > 0.5, ranging from 0.541 to 0.805. Specifically, the trust dimension had factor loadings between 0.631 and 0.779; the communication dimension between 0.640 and 0.805; and the alienation dimension between 0.541 and 0.638. The analysis results indicate that the 20 items comprising the IPPA construct, which serve as observed variables, demonstrate strong validity in representing their respective latent

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dimensions. Table 7 presents the standardized factor loadings, while Figure 2 illustrates the path diagram of the modified CFA model for the IPPA Peer Attachment Subscale.

Table 7. Loading Factor in the CFA Model of IPPA Peer Attachment Subscale (Sources: Personal Data (2024))

						95% Confidence Interval		
Factor	Indicator	Estimate	Std. Error	z-value	p	Lower	Upper	Std. Est. (all)
Trust	PE6	0.799	0.048	16.762	< .001	0.706	0.893	0.731
	PE8	0.644	0.046	13.853	< .001	0.553	0.735	0.633
	PE12	0.663	0.044	15.214	< .001	0.578	0.749	0.680
	PE13	0.678	0.046	14.722	< .001	0.588	0.769	0.666
	PE14	0.678	0.042	15.952	< .001	0.594	0.761	0.706
	PE15	0.844	0.048	17.586	< .001	0.750	0.938	0.757
	PE19	0.766	0.056	13.748	< .001	0.657	0.875	0.631
	PE20	0.697	0.047	14.821	< .001	0.605	0.790	0.667
	PE21	0.813	0.044	18.363	< .001	0.726	0.900	0.779
Communication	PE1	0.767	0.055	13.971	< .001	0.659	0.874	0.640
	PE2	0.748	0.053	14.077	< .001	0.644	0.852	0.643
	PE7	0.835	0.057	14.646	< .001	0.723	0.947	0.663
	PE16	0.907	0.052	17.467	< .001	0.805	1.009	0.755
	PE17	0.933	0.049	19.205	< .001	0.837	1.028	0.805
	PE24	0.852	0.052	16.294	< .001	0.749	0.954	0.720
	PE25	0.841	0.051	16.457	< .001	0.740	0.941	0.724
Alienation	PE10	0.669	0.069	9.668	< .001	0.534	0.805	0.551
	PE11	0.834	0.084	9.901	< .001	0.669	0.999	0.638
	PE18	0.537	0.061	8.778	< .001	0.417	0.657	0.541
	PE22	0.691	0.076	9.080	< .001	0.542	0.841	0.564

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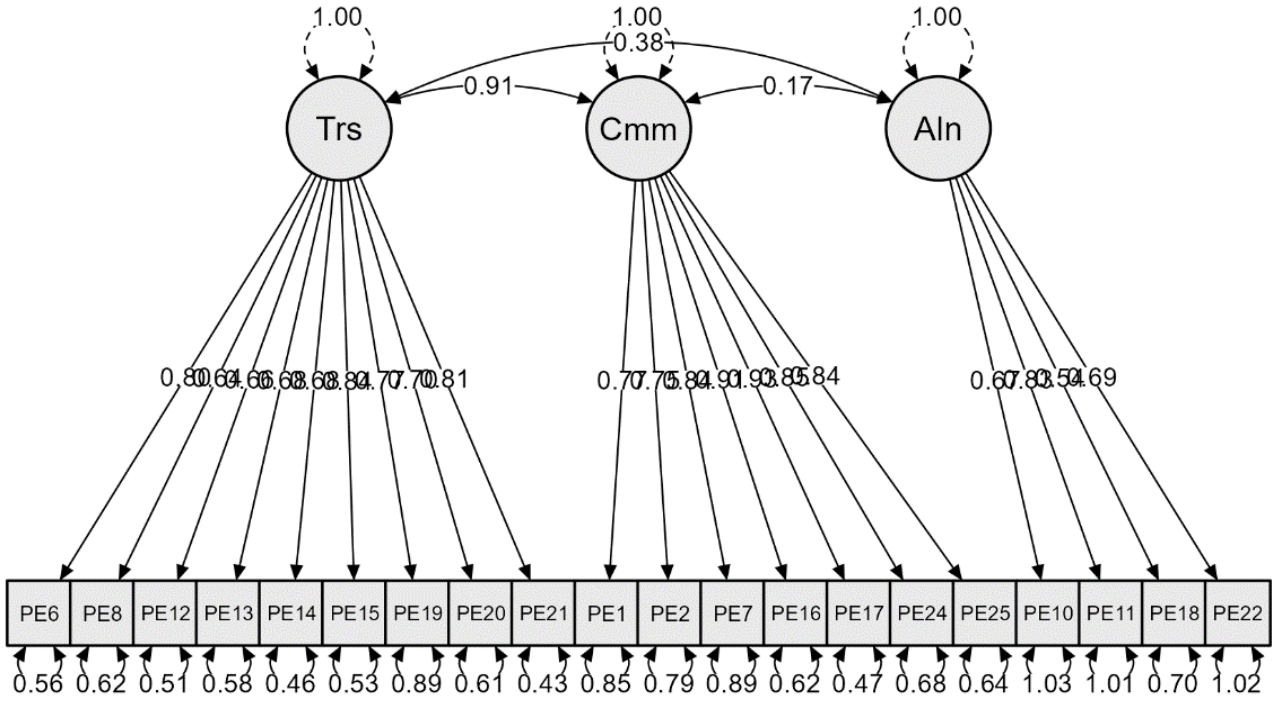

Figure 2. The Schematic Path of the CFA Model for the IPPA Peer Attachment Subscale (Sources: Personal Data (2024))

The results of the CFA for the Indonesian sample indicate that the model demonstrates an acceptable to ideal fit. The Chi-square (χ^2) value was 622.671 with 2 degrees of freedom and reached statistical significance. The goodness-of-fit indices met the recommended thresholds: GFI ≥ 0.90; CFI and TLI ≥ 0.80; and SRMR and RMSEA ≤ 0.08. These values collectively suggest that the model fits the data well. Table 8 presents the results.

Table 8. Results of Model Suitability Testing (Goodness of Fit) (Sources: Personal Data (2024))

Fit Indicator	Criteria	Research Result	Information
Chi-square	>0.05	622.671	Fit
SRMR	≤ 0.08	0.065	Fit
RMSEA	≤ 0.08	0.082 [0.075 – 0.089]	Fit
GFI	≥0.90	0.966	Fit
CFI	≥0.80	0.882	Fit
TLI	≥0.80	0.866	Fit

The results of the HTMT-based discriminant validity test met the required criteria, with values below 0.9 for the trust, communication, and alienation factors. This indicates that the three constructs are indeed distinct from one another (Hair et al., 2022). The details of the results are presented in Table 9.

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Table 9. Results of Heterotrait-Monotrait Ratio (HTMT)

Trust	Communication	Alienation
1.000		
0.892	1.000	
0.293	0.143	1.000

After obtaining evidence supporting content validity and construct validity, reliability testing was conducted. The Composite Reliability (CR) coefficient explains how strongly a measurement indicator reflects its corresponding latent factors. The reliability of a scale increases as each indicator better represents its latent factor. Reliability was also assessed using the Average Variance Extracted (AVE), which represents the proportion of a construct's variance accounted for by its observed indicators. According to Hair et al. (2022), a construct is considered acceptable when the CR value ranges between 0.60 and 0.70, and the AVE value is at least 0.50. The results of the CR and AVE analyses are presented in Table 10.

Table 10. Result of CR and AVE on the Indonesian Version of the IPPA Peer Attachment Subscale (Sources: Personal Data (2024))

Dimension	Reliability	AVE	Conclusion
Trust	α= 0.892	0.484	Reliability is acceptable
	ω = 0.895		
Communication	α= 0.876	0.502	Reliability is acceptable
	ω = 0.870		
Alienation	α= 0.664	0.337	Reliability is acceptable
	ω = 0.660		
Full scale	α= 0.909		
	ω = 0.933		

The CR and AVE values for the Indonesian version of the IPPA Peer Attachment Subscale met the minimum recommended thresholds. According to the criteria proposed by Fornell and Larcker (in Huang et al., 2013), convergent validity is acceptable when the CR value is greater than 0.60, even if the AVE value is below 0.50. These findings show that the IPPA has good reliability and that its indicators consistently measure peer attachment among Indonesian adolescent students.

5. Discussion

This study aimed to adapt and validate the Inventory of Parent and Peer Attachment (IPPA) for use among Indonesian adolescents in secondary schools, focusing specifically on the peer attachment subscale. This subscale measures adolescents' attachment to peers across three theoretically grounded dimensions: trust, communication, and alienation. The CFA findings indicated that the three-factor model demonstrated an acceptable fit to the data, with satisfactory factor loadings and goodness-of-fit indices meeting established psychometric standards. Cronbach's alpha coefficients for the three dimensions ranged from 0.60 to 0.70, indicating acceptable reliability levels for social science research (Hair et al., 2022). These results confirm that the adapted version maintains internal consistency and factorial validity within the Indonesian adolescent population.

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The three-factor structure of the Indonesian version aligns with the original IPPA developed by Armsden and Greenberg (1987), as well as with subsequent validations conducted in Germany (Reiner et al., 2017), India (Pednekar & Tung, 2017), Malaysia (Tan & Arshat, 2019), and China (Zhang & Wang, 2021). This consistency suggests that the conceptual dimensions of peer attachment—trust, communication, and alienation—are culturally stable and represent fundamental aspects of adolescents' relational experiences. The ability of Indonesian students to distinguish between the positive dimensions (trust and communication) and the negative dimension (alienation) supports the universality of attachment processes proposed by Bowlby (1982). Consistent with Allen and Land (1999), these findings reinforce the notion that during adolescence, peers serve as key attachment figures who provide emotional and social support as dependence on parents gradually decreases.

The IPPA has been adapted into various languages and cultural contexts. However, the validation of the IPPA-R peer attachment subscale by Andretta et al. (2017) in Ireland showed unsatisfactory psychometric results. In contrast, Munir et al. (2020) successfully adapted the IPPA-R scale for use in Pakistan, demonstrating strong validity and reliability for the 26-item parent attachment subscale and the 23-item peer attachment subscale, with no significant gender differences. Tohme et al. (2024) adapted the IPPA-R scale into Arabic for use in Lebanon, identifying 19 valid and reliable items on the parent attachment subscale and 21 on the peer attachment subscale. Their findings showed gender-based differences, with girls reporting higher levels of peer attachment than boys and stronger attachment to mothers than to fathers. Similarly, Demetriou et al. (2022) validated the Greek version of the IPPA among Cypriot adolescents, confirming its effectiveness in measuring parent and peer attachment. The study found no significant differences in attachment scores between clinical and non-clinical groups, supporting the scale's use across diverse psychological profiles.

This study also offers additional insights into how peer attachment appears within Indonesia's collectivistic cultural context. In collectivistic societies, attachment bonds with peers are not only emotional but also closely connected to social identity, belonging, and mutual interdependence (Hasanah & Supardi, 2020). This contrasts with Western contexts, where peer relationships often emphasize personal independence and self-expression. Indonesian adolescents may view trust and communication as indicators of loyalty, cooperation, and shared responsibility within their peer groups, reflecting the importance of social harmony in relationships. These cultural differences highlight the need to adapt psychological instruments not only linguistically but also conceptually, to ensure that the constructs stay meaningful within specific sociocultural contexts.

The linguistic adaptation process also revealed culturally specific ways of expressing trust and communication. Several items required modification to reflect the indirect communication style that is common among Indonesian adolescents. For example, emotional support and empathy are often shown through actions rather than explicit verbal expression. This finding aligns with the idea that emotional restraint and politeness are culturally valued behaviors for maintaining harmony in relationships within collectivistic settings (Hasanah & Supardi, 2020). These adjustments increased the instrument's contextual relevance and strengthened its content validity.

Overall, the findings expand previous research by confirming that the IPPA peer attachment subscale is both psychometrically sound and culturally adaptable for use in Indonesia. This study adds to the growing body of cross-cultural research on attachment by showing that the three-dimensional model is applicable across different cultural environments. Furthermore, the adapted instrument serves as a useful tool for researchers, educators, and school counselors to evaluate adolescents' peer attachment, identify students who may be at risk of social isolation, and design interventions that promote positive peer relationships and stronger school connectedness.

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6. Conclusion

The findings of this study show that the Peer Attachment Subscale of the IPPA is a valid and reliable instrument for assessing peer attachment among Indonesian adolescents. Internal validity testing of the Indonesian version of the IPPA indicated that the overall goodness-of-fit indices met the recommended criteria. Although the AVE values for the Trust and Alienation dimensions were relatively low, the CR values remained within acceptable ranges, showing satisfactory internal consistency.

As a self-report instrument, this scale effectively measures peer attachment as perceived by adolescent students in the Indonesian context, with strong psychometric properties. The adaptation and validation of the Indonesian version of the IPPA Peer Attachment Subscale provide important opportunities for future research and school-based interventions. Assessing the quality of peer relationships can help predict various psychosocial outcomes, such as academic engagement, emotional well-being, and the likelihood of engaging in delinquent behaviors.

For school counselors, understanding peer attachment patterns can help identify students who face social challenges or feel isolated from their peer groups. Group-based interventions, such as peer mentoring and peer support programs, can then be developed to strengthen trust and communication among students while reducing social alienation. In today's context of technological development, peer attachment is also relevant for understanding adolescents' online interaction behaviors. Although strong peer bonds may form through online platforms, healthy attachment quality still depends on face-to-face interactions to build genuine emotional closeness.

7. Suggestion

One limitation of this study is the limited sample, which included only secondary school students from selected regions. This limitation may affect how well the findings represent adolescents from other areas or educational backgrounds. To improve external validity, future research should involve samples that are more geographically and ethnically diverse.

In addition, the IPPA Peer Attachment Subscale was validated only for adolescents aged 12 to 18 years; therefore, its use with other age groups should be further examined. The instrument was administered only to adolescents in Medan, Indonesia, showing the need for replication in other urban and rural areas to ensure broader contextual relevance. Longitudinal studies are also recommended to evaluate the stability of peer attachment across developmental stages. Examining the predictive validity of this subscale in relation to psychological well-being, academic performance, and mental health outcomes would also provide deeper insight into the role of peer relationships in adolescent development in the Indonesian context.

Declarations

Author Contributions. All authors have read and approved the published version of this article.
Conflicts of Interest. The authors declare no conflict of interest.
Funding. Indonesian Education Scholarship (BPI), Center for Higher Education Funding and Assessment (PPAPT), Indonesian Endowment Fund for Education (LPDP), and Ministry of Higher Education, Science and Technology of the Republic of Indonesia.
Ethical Approval. This study was approved by the Research Ethics Committee of the Universitas Surabaya, Indonesia with Ethical Clearance Certificate Number 371/KE/V/2024.
Data Availability Statement. The data supporting the findings of this study are considered confidential and are not publicly available, in accordance with the conditions outlined in the approved human ethics protocol.

Acknowledgments. During the preparation of this manuscript, ChatGPT (OpenAI) was used to improve the language, structure, and clarity of the writing. The author critically reviewed and revised the final content and takes full responsibility for the integrity and accuracy of the published work.

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