The Validation of the Inventory of Peer Attachment (IPA) among Chinese Migrant and Urban Adolescents

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Abstract. Background: The Inventory of Peer Attachment (IPA), developed by Armsden and Greenberg, is a widely used self-report questionnaire that measures peer attachment in youth. However, previous research has found that the factor-structure of the IPA is inconsistent in different cultures and among different groups. Given the absence of a valid and reliable measure of peer attachment for Chinese adolescents, particularly those in disadvantages, the current study aimed to validate the IPA among Chinese migrant and urban junior high school students. Purpose of the study: The current study intended to examine psychometric properties and measurement invariance of the IPA across urban and migrant junior high school students. Method: A Chinese version of the IPA (IPA-C) was adopted under back translation procedure among a sample of 731 participants (17.96% missing data, M = 13.77, SD = 1.00). Item analysis, exploratory and confirmatory factor analysis, measurement invariance analysis, concurrent validity and reliability analysis were conducted. Results: The study revealed a best model fit for the three-factor modified IPA. This model had strong measurement invariance across urban and migrant students. This study also supports the concurrent validity of the IPA. Significance: The research results provide a reliable questionnaire for subsequent studies on peer attachment among Chinese urban and migrant adolescents.

Keywords: peer attachment, reliability, validity, measurement invariance, Chinese migrant children.

1 Introduction

A Subsection Sample

Attachment is an individual's enduring emotional bond to significant others (e.g., parents, friends, and intimate partners), which generalizes into different patterns of attachment at specific times, and plays an important role throughout a person's life cycle [1-3]. Early in childhood, parents are the primary object of an individual's attachment, but from mid-childhood through late adolescence, the specific object of attachment gradually shifts from parents to peers [4-11]. In early adolescence,

individuals begin to look to their peers for more support, and peer relationships begin to become an important part of the secure base [12]. Peer attachment becomes a primary source of emotional and social support for adolescents [13, 14] and an important predictor of positive social, emotional, and behavioral outcomes [15].

Numerous empirical studies have shown that peer attachment is both a facilitator of positive outcomes and a protective factor against negative outcomes. With regard to the former, peer attachment makes a significant contribution to various aspects of psychological adjustment [16, 17]. For example, high peer attachment is significantly associated with self-perceived competence, psychological well-being, academic achievement, and self-esteem [18-23], and improved peer attachment can promote pro-social behavior in adolescents [24]. Regarding the latter, high peer attachment is associated with less delinquent and aggressive behavior [25, 26], and negatively associated with perpetration and victimization of both face-to-face and cyberbullying, conduct problems, and emotional difficulties [15, 27]. In addition, positive peer attachment is a protective factor for Facebook addiction [28], compensating and buffering against the negative effects of family or life experiences [29, 30]. Therefore, attention to and scientific measurement of adolescent peer attachment is indispensable for promoting healthy adolescent development.

An instrument that meets psychometric standards and has good applicability is a prerequisite for studying adolescent peer attachment. Current instruments for measuring adolescent peer attachment mainly include the Inventory of Parent and Peer Attachment (IPPA) [19], the People in My Life scale (PIML) [31], and the Adolescent Friendship Attachment Scale (AFAS) [32], among others [12]. Of these, the IPPA is the most widely used scale [12, 31], and the PIML is a continuation of the IPPA by removing or adapting the items to be applicable to younger children [31]. The IPPA was originally designed to provide researchers as well as clinical practitioners with a multidimensional measurement tool that could reflect the complexity of attachment [33], and its reliability and validity have been supported by numerous studies [34-39]. Nonetheless, its structure, item removal and retention, and correlations between sub-dimensions have not yielded consistent results across cultures as well as subject groups. Thus, researchers need to make further revisions to address specific cultural and subject characteristics in order to ensure the applicability of the IPPA.

Specifically, some researchers have suggested that initially Armsden and Greenberg [19] developed the IPPA using only a small sample, and that some of the items had cross-dimensional loadings, ambiguous meanings, and insufficiently clear relationships to the dimensions to which they belonged. Correlations between dimensions, especially between trust and communication, are high and need further revision [33]. In addition, the IPPA has been applied in different cultures and subject groups with different structures, including one-factor [40], two-factor [41], and three-factor structures [33, 42, 43]. It has also been found that the alpha coefficient of peer alienation is lower in Spanish subjects [15]. The above problems with the IPPA also apply to its subquestionnaire Peer Attachment in Adolescents.

The IPPA sub-questionnaire (Inventory of Peer Attachment, IPA) [19] was chosen for this study to examine its measurement properties among Chinese migrant

and urban adolescents. The IPA measures attachment relationships among best friends, which have the greatest influence on adolescents. A review of the revision studies of the IPA in China reveals that the questions in the original version of the questionnaire are not well answered at present. For example, some studies used only factor analysis and alpha coefficients in the revision process, and the questionnaire's structure and reliability issues have not been well verified [44]. Some studies used alpha coefficients, retest reliability, CFA, concurrent validity and other analytical processes, but at the same time did not solve the problems of cross-dimensional loading and ambiguity of the original questionnaire items [43]. Other studies have used item response theory for revision, but the subject group was limited to Hmong adolescents, and the applicability of the scale to other adolescent groups is debatable [41]. The applicability of the IPA to Chinese adolescents is still in need of revision.

Middle school is a critical period for individuals to transition from childhood to adolescence, and the role of peer attachment is gradually increasing [12]. Urban and migrant junior high school students are two groups that deserve attention, especially migrant junior high school students, a group formed under the special social background of large-scale population movement in China. Compared with urban students, they face multiple difficulties in family, education, health care, and well-being [45-49]. Therefore, exploring the applicability of the IPA in the two groups will not only help to provide a reliable measurement tool for accurately grasping the current status of peer attachment in the two groups, but also help to further develop scientific research on peer attachment, and ultimately provide rationalized recommendations for promoting the positive development of migrant and urban adolescents.

In sum, the current study intended to examine psychometric properties and measurement invariance of the IPA across urban and migrant junior high school students. Will the original three-factor structure of the IPA (i.e., trust, communication, and alienation) be applicable to Chinese junior high school students? Will all the items acceptable for this group of students? Will the IPA's factor structure similar across urban and migrant students? We hypothesized that the three-factor structure of the IPA will fit the data among the junior high school students. However, some problematic items will be identified and model modification will be needed. The revised three-factor IPA will be similar in strong measurement invariance across the urban and migrant junior high school students.

2   Method

2.1   Participants

A Chinese version of the IPA (IPA-C) was adopted under back translation procedure among a sample of 731 participants (17.96% missing data, M = 13.77, SD = 1.00). Within this demographic, 36.5% were grade 7, 37.6% were grade 8, and 25.9% were grade 9; 49.9% were male and 48.2% were female and 1.9% were missing by gender.

There were 39.67% migrant junior high school students and 45.55% urban junior high school students, with 14.77% not reporting their household registration information.

The questionnaires were filled out and returned collectively by students in class with the help of the examiners who were trained graduate students in psychology.

2.2   Measures

2.2.1 Inventory of Peer Attachment

Inventory of Peer Attachment (IPA) [19] is a subquestionnaire of IPPA. IPPA was developed by Armsden and Greenberg for individuals who are 16-20 year old [19]. The IPA consists of 25 items, including the dimensions of Trust (e.g., "My friends understand me"; 10 items), Communication (e.g., "I like to get my friends' point of view on things I'm concerned about"; 8 items), and Alienation (e.g., "I feel angry with my friends."; 7 items). All items were rated on a five-point Likert-type scale, with 1 representing *never* and 5 representing *always*. The internal consistency coefficients for the dimensions of trust, communication, and alienation were .91, .87, and .72, respectively [19].

2.2.2 The Friendship Quality Questionnaire

The Friendship Quality Questionnaire (FQQ) was developed by Parker and Asher [50] and revised by Zou et al. [51] to assess the quality of friendships among children and adolescents. The revised Chinese version of the questionnaire was used in this study [52]. The questionnaire consists of 38 items, with item 7 being a reverse scoring question, which was scored on a five-point Likert-type scale ranging from "strongly disagree" to "strongly agree". Five dimensions were included, helping and guiding (e.g., "We especially do favors for each other,"; 12 items, α= .88), companionship and recreation (e.g., "We always talk or play together between classes,"; 6 items, α= .73), validation and caring (e.g., "He/she tells me that I am good at doing certain things"; 8 items, α= .80), intimate exchange (e.g., "I tell him/her when I am angry about something"; 5 items, α= .80), conflict and betrayal (e.g.. "We are often angry with each other"; 7 items, α = .67) [51]. Three dimensions of the Friendship Quality Questionnaire (i.e., validation and caring, intimate exchange, conflict and betrayal), which are closely related to peer attachment, were selected as validity scales for this study.

2.3   Data analyses

First, the data were item analyzed to examine item discrimination as well as the item-total correlations. Second, structural validity analyses were conducted, using the cross-validation in which the total sample was randomly divided into two subsamples, the model was revised in Subsample one, and then tested in Subsample two. The structural validity analysis consisted of four stages. The first three phases were revision phases with Subsample one, and the final phase was testing the revised model, with Subsample two.

In stage one, three models based on previous studies (three-factor, model 1; two-factor, model 2, and one-factor, model 3) were subjected to CFA validation and model comparisons; meanwhile, three models based on EFA (one-factor, model 4; two-factor, model 5; and three-factor, model 6;) were subjected to CFA validation and model comparisons. The use of the above strategies was to confirm the optimal factor structure, the three-factor model (model 1). But there were still problems such as less optimal fit, low and non-significant factor loadings of certain items, cross-dimensional loadings, and low item-total correlations of the items. In stage 2, further revisions were made to determine the most appropriate 3-factor model. The structure of model 1 was retained, and the new model (model 7) was obtained and validated with CFA through deleting the items with low item-total correlations, deleting the items with low factor loadings and cross-dimensional loadings based on the results of model 6. Next, a CFA (model 8) was performed based on the structure of model 6. Then, model comparisons were made between the three models (model 1, model 7, model 8), and the model 7 significantly outperformed the other two models. In Stage 3, the new model (model 7) still had the problems of low factor loadings and low item-total correlations for certain individual items. It continues to be revised based on the revision suggestions in order to confirm better revision results. A CFA (model 9) was performed based on model 7 by deleting item 22, which had a low factor loading and item-total correlation. Next, a CFA (model 10) was performed based on modifications of model 9 by setting up the residual correlation for items 13 and 14. Further, with model comparison between model 9 and model 10, model 10 was significantly better than model 9 and was the final model. In stage 4, a CFA (model 11) was performed based on the structure of model 10 in Subsample two. At last, composite reliability and concurrent validity of the revised peer attachment questionnaire were calculated.

3   Results

3.1   Item analysis

The results show that, 25 items had good discrimination (p<.01), and the corrected item-total correlations ranged from 0.225 to 0.806 (p<.01). But, the total correlation coefficient of item 5 and item 9 were low with $r < .30$.

3.2   Structural validity analysis

The results of structural validity analysis are presented in Table 1. In stage one, the results showed significant differences in the model comparisons, with a better CFA fit for the three-factor model (model 1). Then, the three-factor model (model 6) based on EFA was better than the other two models. That is, the results of stage one showed that the three-factor structure was superior to the one- and two-factor structures. In stage 2, Model 7 fitted the data well, but the factor loading of item 22 was low at .250. Next, model 8 fitted worse than model 7. CFA comparisons of the

three models (model 1, model 7, model 8) showed that model 7 significantly outperformed the other two models. That is, the results of stage 2 indicate that the newly revised model (model7) should be retained. In stage 3, model 9 was a good fit. Next, model 10 was well fitted and the comparing between model 9 and model 10 showed that model 10 was significantly better and became the final model. In stage 4, a CFA (model 11) was performed based on the structure of model 10 in sub-sample two，and the results show that model 11 was well fitted.

Table 1

Structural validity analysis results of the three-factor modified IPA

Model	χ^2	df	RMSEA [90% CI]	CFI	SRMR	BIC	Model Comparisons	△BIC
M1	1131.491	275	.084 [.079-.089]	.766	.084	30483.117	M1 versus M2	95.571
M2	1066.860	274	.081 [.076-.086]	.784	.116	30387.546	M2 versus M3	49.076
M3	1022.600	272	.079 [.074-.084]	.795	.114	30338.470	M1 versus M3	144.647
M4	1131.490	275	.084 [.079-.089]	.766	.084	30483.117	M4 versus M5	335.621
M5	817.215	251	.072 [.066-.077]	.845	.050	30147.496	M5 versus M6	207.068
M6	545.678	228	.056 [.050-.062]	.913	.037	29940.428	M4 versus M6	542.689
M7	**285.080**	**116**	**.058 [.049-.066]**	**.910**	**.066**	**20862.227**	**M3 versus M7**	**9476.243**
							M8 versus M7	9001.849
M8	675.986	272	.058 [.053-.064]	.890	.066	29864.076	M3 versus M8	474.394

M9	235.068	101	.055	.925	.055	19483.650	M7 versus M9	1378.577
			[.046-.064]					
M10	190.926	100	.045	.949	.050	19426.849	M9 versus M10	56.801
			[.036-.055]					
M11	178.185	100	.052	.941	.056	12550.544		
			[.039-.064]					

Note: M1-M10 are all models tested in Subsample one (*n=440*) and M11 is the model validated in Subsample two (*n=291*). M1 represents the 3-factor structural model proposed by the original authors; M2 represents a two-factor structural model based on previous research that combined trust and communication into a single dimension with alienation; and M3 represents a one-factor structural model. M4, M5, and M6 represent the one-factor, the two-model, and the three-factor structural models of the EFA results, respectively. M7 represents the model that retained the 3-factor structural of M1 and removed all items with small factor loadings, low item-total correlations and cross-dimensional loadings. M8 represents a model based on the 3-factor EFA structure; M9 represents a model based on M7 after deleting item 22, which had small factor loading and weak item-total correlation. M10 represents the model after setting up the residual correlation of items 13 and 14 based on M9 and M11 represents the model that tested M10 in Subsample two.

3.3   Measurement invariance testing

The three-factor modified IPA and the friendship quality questionnaire were tested separately for Chinese urban and migrant adolescents, which showed adequate fit to the data for both groups, supporting configural, metric, and scalar invariance (see Table 2). Then, the combined reliability of trust, communication, and alienation dimensions of the three-factor modified IPA were .892, .801, and .691 for the entire student; .902, .793, and .679 for the urban students, and .887, .807, and .696 for the migrant students, respectively.

Table 2

Measurement invariance results of the three-factor modified IPA and the friendship quality questionnaire

Model	χ^2	df	RMSEA [90%CI]	CFI	SRMR	Model Comparisons	$\triangle$CFI	SBχ^2diff	$\triangle$df	p
The three-factor modified IPA										
Urban (*n*=333)	216.056	100	.059 [.048-.070]	.924	.057					
Migrant (*n*=290)	176.223	100	.051 [.039-.064]	.937	.056					
Configural	393.306	200	.056 [.048, .064]	.930	.057					
Metric	403.361	213	.054 [.046, .062]	.931	.059	Metric versus Configural	-.001	7.556	13	.871
Scalar	429.483	229	.053 [.045, .061]	.927	.064	Scalar versus Metric	.004	24.974	16	.070
The friendship quality questionnaire										
Total (*n*=709)	708.297	167	.067 [.062, .073]	.868	.096					
Urban (*n*=327)	475.244	167	.075 [.067, .083]	.854	.103					
Migrant (*n*=282)	334.840	167	.060 [.050, .069]	.886	.096					
Urban_de7R	387.092	149	.070	.882	.070					

			[.061, .078]						
Urban_de7R	282.206	148	.053	.934	.067				
+37 with 38			[.043, .062]						
Migrant_de7R	275.760	149	.055	.910	.076				
			[.045, .065]						
Configural	557.727	297	.054	.924	.071				
			[.047 .061]						
Metric	579.991	313	.053	.922	.075	Metric versus Configural	.001	21.787	16	.150
			[.046, .060]						
Scalar	609.380	332	.052	.919	.080	Scalar versus Metric	.003	27.802	19	.087
			[.046, .059]						

Note: *p <.05; **p < .01; ***p < .001.

IPA= inventory of peer attachment; RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR= standardized root mean square residual; SB = Satorra-Bentler; χ^2_{diff} = nested χ^2 difference test. Urban= urban junior high school students; Migrant=migrant junior high school students. In analyzing the measurement invariance of the friendship quality questionnaire, the baseline model for urban junior high school students deleted the item 7 and set the residual correlation between the item 37and item 38, the baseline model for migrant junior high school students deleted item 7.

3.4   Correlation of the dimensions of the IPA and concurrent validity

First, multiple interpolation was applied to the missing data at the level of the observed indicators for correlation analysis of variable relationships. The trust, communication, and alienation dimensions of the three-factor modified IPA were significantly correlated, with trust being positively correlated with communication, negatively correlated with alienation, and communication negatively correlated with alienation. This study provides support for the concurrent validity of the IPA and the subscale scores on the IPA were correlated in the expected direction with scores of the three subscales of Friendship Quality Questionnaire: validation and caring (r = -

.166-.519; *p* < 0.01), intimate exchange (*r* = -.089-.438; *p* < 0.01), conflict and betrayal (*r* = -.247-.300; *p* < 0.01) (see Table 3).

Table 3

Correlations between peer attachment and friendship quality (*N*=731)

	1	2	3	4	5	6
1 Trust	-					
2 communication	.673**	-				
3 alienation	-.301**	-.157**	-			
4 validation and caring	.531**	.525**	-.154**	-		
5 intimate exchange	.454**	.433**	-.081*	.689**	-	
6 conflict and betrayal	-.195**	-.145**	.297**	-.125**	-.016*	-

Note. *p* <.05; **p* < .01.

4   Discussion

Peer attachment is important for the healthy development of urban and migrant middle school students. A peer attachment questionnaire that meets the measurement criteria and has good applicability is an important prerequisite for conducting research in this area. In this study, the most widely used peer attachment questionnaire (IPA) was selected, and the IPA was revised to address the problems of inconsistencies in its factor structure, item attribution, and retention across cultures and subjects. The revised questionnaire was found to have a good applicability to the urban and migrant junior high school students in China. The IPA had high structural validity and met the measurement invariance between urban and migrant junior high school students, as well as good composite reliability and concurrent validity.

First of all, many rational strategies were used to revise the questionnaire in order to solve the problems of factor structure, item removal and retention. This study used the cross-validation to identify the optimal factor structure. In the revision stage, combining both CFA and EFA methods and referring to the results and strategies of previous studies [31, 42, 43], we used the model comparison strategy to finally confirm the three-factor model as the best structure. Then, in order to confirm a better revision result, the revision was continued based on the modifications. Finally, the revised final model was obtained. The revised three-factor short version of the Peer Attachment Questionnaire possessed (IPA-C) high structural validity, indicating that peer attachment is a multidimensional structure in the Chinese urban and migrant junior high school students. The three-factor structure better reflects the complexity of

peer attachment, which in turn more fully reflects individual differences in attachment. It also suggests that the IPA needs to be further revised according to the characteristics of different cultures and subjects in order to ensure the applicability of the questionnaire to specific groups.

The IPA-C had strong measurement invariance and good applicability across the two groups of Chinese urban and migrant middle school students. This suggests that the differences between the two groups derive from intergroup differences rather than the instrument itself. The questionnaire has the same meaning and function across the two groups. The two groups showd the same understanding of peer attachment. This provides a tool with good applicability for further research related to peer attachment in both groups. This study provides evudence for the concurrent validity of the IPA-C that subscale scores on the IPA were correlated in the expected direction with scores on the three subscales of Friendship Quality Questionnaire. This result suggests that secure peer attachment is associated with higher friendship quality than insecure peer attachment, which is also consistent with previous research [53, 54]. In summary, the IPA-C has satisfactory psychometric properties in Chinese urban and migrant middle school students.

Disclosure of Interests. The authors have no competing interests to declare that are relevant to the content of this article.

References

1. Ainsworth, M. D. S., Blehar, M. C., Waters, E., Wall, S.: Patterns of attachment. Psychology Press, (2015)
2. Bowlby, J.: Attachment and loss: Vol.1. attachment. 2nd edn. Basic Books, (1969/1982)
3. Stroufe, L. A.: Attachment and the roots of competence. Human Nature **1**, 50–57 (1978)
4. Crowell, J. A., Waters, E.: Bowlby's theory grown up: the role of attachment in adult love relationships. Psychological Inquiry **5**(1), 31–34 (1994)
5. Fraley, R. C., Davis, K. E.: Attachment formation and transfer in young adults' close friendships and romantic relationships. Personal Relationships **4**(2), 131–144 (1997)
6. Freeman, H., Brown, B. B.: Primary attachment to parents and peers during adolescence: Differences by attachment style. Journal of Youth and Adolescence **30**(6), 653–674 (2001)
7. Furman, W., Wehner, E. A.: Adolescent romantic relationships: A developmental perspective. In: Shulman, S., Collins, W. A. (eds.) Romantic relationships in adolescence: Developmental perspectives, pp. 21–36. Jossey-Bass/Wiley (1997)
8. Hazan, C., Shaver, P.: Romantic love conceptualized as an attachment process. Journal of Personality and Social Psychology **52**(3), 511–524 (1987)
9. Hazan, C., Zeifman, D.: Sex and the psychological tether. In: Bartholomew, K., Perlman, D. (eds.) Attachment processes in adulthood, pp. 151–178. Jessica Kingsley Publishers (1994)

10. Schneider, B. H., Younger, A. J.: Adolescent-parent attachment and adolescents' relations with their peers: A closer look. Youth & Society **28**(1), 95–108 (1996)
11. Sroufe, L. A., Waters, E.: Attachment as an organizational construct. Child Development **48**(4), 1184–1199 (1977)
12. Zhong, X., Liu, J. H., Chen, X.: Adolescent peer attachment: a developmental perspective. Advances in Psychological Science **22**(07), 1149–1158 (2014)
13. Gorrese, A., Ruggieri, R.: Peer attachment: A meta-analytic review of gender and age differences and associations with parent attachment. Journal of Youth and Adolescence **41**(5), 650–672 (2012)
14. Lee, J. Y., Park, S. H.: Interplay between attachment to peers and parents in Korean adolescents' behavior problems. Journal of child and family studies **26**(1), 57–66 (2017)
15. Schoeps, K., Mónaco, E., Cotolí, A., Montoya-Castilla, I.: The impact of peer attachment on prosocial behavior, emotional difficulties and conduct problems in adolescence: The mediating role of empathy. PloS one **15**(1), (2020)
16. Mota, C. P., Matos, P. M.: Peer attachment, coping, and self-esteem in institutionalized adolescents: The mediating role of social skills. Journal of Psychology of Education **28**(1), 87–100 (2013)
17. Murphy, T. P., Laible, D., Augustine, M.: The influences of parent and peer attachment on bullying. Journal of child and family studies **26**(5), 1388–1397 (2017)
18. Nada Raja, S., McGee, R., Stanton, W. R.: Perceived attachments to parents and peers and psychological well-being in adolescence. Journal of Youth and Adolescence **21**(4), 471–485 (1992)
19. Armsden, G. C., Greenberg, M. T.: The Inventory of Parent and Peer Attachment: Individual differences and their relationship to psychological well-being in adolescence. Journal of Youth and Adolescence **16**(5), 427–454 (1987)
20. Buhrmester, D.: Intimacy of friendship, interpersonal competence, and adjustment during preadolescence and adolescence. Child development **61**(4), 1101–1111 (1990)
21. Bukowski, W. M., Hoza, B., Boivin, M.: Popularity, friendship, and emotional adjustment during early adolescence. In: Laursen, B., (ed.) Close friendships in adolescence, pp. 23–37. Jossey-Bass (1993)
22. Hartup, W. W.: The company they keep: Friendships and their developmental significance. Child Development **67**(1), 1–13 (1996)
23. Nickerson, A. B., Nagle, R. J.: The influence of parent and peer attachments on life satisfaction in middle childhood and early adolescence. Social Indicators Research **66**(1-2), 35–60 (2004)
24. Oldfield, J., Humphrey, N., Hebron, J.: The role of parental and peer attachment relationships and school connectedness in predicting adolescent mental health outcomes. Child and adolescent mental health **21**(1), 21–29 (2016)
25. Laible, D. J., Carlo, G., Raffaelli, M.: The differential relations of parent and peer attachment to adolescent adjustment. Journal of Youth and Adolescence **29**(1), 45–59 (2000)
26. Liu, H., Dou, K., Yu, C., Nie, Y., Zheng, X.: The Relationship between Peer Attachment and Aggressive Behavior among Chinese Adolescents: The Mediating Effect of Regulatory Emotional Self-Efficacy. International journal of environmental research and public health **18**(13), 7123 (2021)
27. Wright, M. F., Schiamberg, L. B., Wachs, S., Huang, Z., Kamble, S. V., Soudi, S., Bayraktar, F., Li, Z., Lei, L., Shu, C.: The Influence of Sex and Culture on the Longitudinal Associations of Peer Attachment, Social Preference Goals, and Adolescents'

Cyberbullying Involvement: An Ecological Perspective. School Mental Health, 1–13 (2021)

28. Badenes-Ribera, L., Fabris, M. A., Gastaldi, F., Prino, L. E., Longobardi, C.: Parent and peer attachment as predictors of facebook addiction symptoms in different developmental stages (early adolescents and adolescents). Addictive behaviors **95**, 226–232 (2019)

29. Criss, M. M., Pettit, G. S., Bates, J. E., Dodge, K. A., Lapp, A. L.: Family adversity, positive peer relationships, and children's externalizing behavior: A longitudinal perspective on risk and resilience. Child Development **73**(4), 1220–1237 (2002)

30. Nam, B., Kim, J. Y., Bright, C. L., Jang, D.: Exposure to Family Violence, Peer Attachment, and Adolescent-to-parent Violence. Journal of interpersonal violence 886260520960109. Advance online publication. (2020)

31. Ridenour, T. A., Greenberg, M. T., Cook, E. T.: Structure and validity of people in my life: A self-report measure of attachment in late childhood. Journal of youth and adolescence **35**(6), 1037–153 (2006)

32. Wilkinson, R. B.: Development and properties of the Adolescent Friendship Attachment Scale. Journal of Youth and Adolescence **37**(10), 1270–1279 (2008)

33. Pace, C. S., San Martini, P., Zavattini, G. C.: The factor structure of the Inventory of Parent and Peer Attachment (IPPA): A survey of Italian adolescents. Personality and Individual Differences **51**(2), 83–88 (2011)

34. Adam, E. K., Chase-Lansdale, P. L.: Home sweet home(s): Parental separations, residential moves, and adjustment problems in low-income adolescent girls. Developmental Psychology **38**(5), 792–805 (2002)

35. Armsden, G. C., McCauley, E., Greenberg, M. T., Burke, P. M., Mitchell, J. R.: Parent and peer attachment in early adolescent depression. Journal of Abnormal Child Psychology **18**(6), 683–697 (1990)

36. Black, K. A., McCartney, K.: Adolescent Females' security with parents predicts the quality of peer interaction. Social Development **6**(1), 91–110 (1997)

37. Formoso, D., Gonzales, N. A., Aiken, L. S.: Family conflict and children's internalizing and externalizing behavior: protective factors. American journal of community psychology **28**(2), 175–199 (2000)

38. Paterson, J., Pryor, J., Field, J.: Adolescent attachment to parents and friends in relation to aspects of self-esteem. Journal of Youth and Adolescence **24**(3), 365–376 (1995)

39. Pavlidis, K., McCauley, E.: Autonomy and relatedness in family interactions with depressed adolescents. Journal of abnormal child psychology 29(1), 11–21 (2001)

40. Alonso-Arbiol, I., Balluerka, N., Gorostiaga, A., Aritzeta, A., Gallarin, M., Haranburu, M.: Attachment dimensions in adolescence: an adaptation of the Inventory of Parent and Peer Attachment (IPPA) into Basque / Dimensiones del apego en la adolescencia: adaptación al euskera del Inventario de Apego de Progenitores y Pares (IPPA). Studies in Psychology **35**(2), 359–386 (2014)

41. Zang, Y. H., Zhao, S. Y., Chen, W., Pan, Y., Zhang, Y.: Modifying parents peer attachment scale with item response theory. Journal of Guizhou Normal University (Natural Sciences) **30**(002), 22–27 (2012)

42. Kocayörük, E.: A Turkish adaptation of the inventory of parent and Peer Attachment: The reliability and validity study. Journal of Educational Research (40), 133–150 (2010)

43. Zhang, Y. L., Zhang, Y. L., Zhang, Y. X., Wang, J. L., Huang, C. Y.: Reliability and validity of Chinese version of Revised Inventory of Parent and Peer Attachment in junior students. Chinese Mental Health Journal **25**(01), 66–70 (2011)

44. Bao, K. B., Xu, Q. M.: A comparison of attachment in adolescents of Mainland China and Malaysia. Chinese Journal of Clinical Psychology **14**(2), 172–174 (2006)

45. Wang, D.: Reduction but not elimination: health inequalities among urban, migrant, and rural children in China-the moderating effect of the fathers' education level. BMC public health **19**(1), 1219 (2019)
46. Wei, Y. M., Gong, Y.: Understanding chinese rural-to-urban migrant children's education predicament: a dual system perspective. International Journal of Educational Development **69**, 1–10 (2019)
47. Cui, K., To, S.-m.: Migrant status, social support, and bullying perpetration of children in mainland China. Children and Youth Services Review **107**, (2019)
48. Li, C., Jiang, S.: Social exclusion, sense of school belonging and mental health of migrant children in China: A structural equation modeling analysis. Children and Youth Services Review **89**, 6–12 (2018)
49. Li, M., Mustillo, S., Wang, W.: Perceived Discrimination, Screen Use, and BMI Among Rural-to-Urban Migrant Children in China: Evidence from a Nutrition Transition Context. Journal of immigrant and minority health **21**(4), 723–730 (2019)
50. Parker, J. G., Asher, S. R.: Friendship and friendship quality in middle childhood: links with peer group acceptance and feelings of loneliness and social dissatisfaction. Developmental Psychology **29**(4), 611–621 (1993)
51. Zou, H., Zhou, H., Zhou, Y.: The relationship between friendship, friendship quality, and peer acceptance among middle school students. Journal of Beijing Normal University(Social Sciences) (01), 43–50 (1998)
52. Jia, Y. F.: *The effects of family parenting style and friendship quality on the development of intergroup attitudes among migrant and urban children.* Master Thesis, Nanjing Normal University (2021)
53. Weimer, B. L., Kerns, K. A., Oldenburg, C. M.: Adolescents' interactions with a best friend: associations with attachment style. Journal of experimental child psychology, **88**(1), 102–120 (2004)
54. Zimmermann, P.: Attachment representations and characteristics of friendship relations during adolescence. Journal of experimental child psychology, **88**(1), 83–101(2004)