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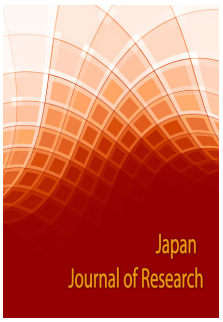

Examining the Development of Peer Attachment Based on Parental Attachment, and Collaborative Impacts on Mental Health among Japanese Youth

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Abstract

This study aimed at confirming the factor structure of the Japanese version of Inventory of Parent and Peer Attachment (IPPA) for peers. Furthermore, it examined whether or not peer attachment is significantly influenced by father and/or mother attachment, and to see whether father and mother attachment affects mental health directly and/or indirectly via peer attachment for each gender among Japanese youth. The targets of this study were 433 (men: 149, women: 284) Japanese college students who completed every item of the Japanese version of father, mother, and peer IPPAs, as well as Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM) to evaluate their mental health. Confirmatory Factor Analysis (CFA) was conducted to confirm the factor structure of the Japanese version of peer IPPA. Structural Equation Modelling (SEM) was utilized to see whether or not peer attachment is significantly influenced by father and/or mother attachment, and whether or not peer attachment mediates between parental IPPA and mental health. A bi-factor model, constituted by one general factor and three specific factors forming the original IPPA developed by Armsden & Greenberg (1989), was supported by excluding one item from the specific factor Alienation. SEM revealed that the mental health of both male and female respondents was significantly influenced by peer attachment. Among males, its platform was built by attachment only to the father, whereas among females, it was built by both father and mother attachment.

Introduction

In the realm of clinical psychology, attachment theory has been the focus of attention, due to the significant impacts of attachment originally developed between an infant and his/her caregiver, on the infant's later mental health. According to Bowlby, who proposed the attachment theory, two Internal Working Models (self- and primary attachment figure models) are developed [1-3]. The self-model is about whether or not he/she is worth being responded to by the attachment figure under stressful situations, and the attachment figure model is about whether or not the attachment figure is available and responding to his/her needs. Bowlby's view is that the first five years of an individual's life is critical for developing attachment, and after this period, plasticity of the attachment style decreases. Bowlby premises that after 10 years of age, an individual's attachment style or stability rarely changes, and attachment styles with any new attachment figure develops based on the above models.

Indeed, Hazan & Shaver view that the attachment style within the romantic relationship is the result of internalization of attachment style developed within the relationship with the primary attachment figure during infancy [4]. Gorrese & Ruggieri conducted a meta-analysis of previous research, concluding that parental attachment and peer attachment moderately correlated with each other [5]. However, it is merely the correlation. More specifically, it does not mean that peer attachment develops based on parental attachment.

On the other hand, some scholars view that attachment style does change during an individual's life even after becoming an adult. Some studies show that this change is provoked especially after major life events [6-9]. The range of attachment figures increases from infancy to young adulthood through childhood and adolescence, and the importance of each attachment figure can change depending on the life stage. During infancy, the mother is the crucial attachment figure, soon to be accompanied by father and siblings. During childhood and adolescence, peers take this role. Finally, in adulthood a romantic partner

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appears. The major change from childhood to adolescence is the shift in weight of attachment from parents to peers, i.e., peer attachment increases from childhood to adolescence, while parental attachment decreases.

If an individual's attachment style does not change throughout his/her life, attachment stability does not differ between any attachment figures. This means that Internal Working Models developed within the mother and infant lay the foundation for developing attachment with other figures including the father, siblings, peers, and romantic partner. On the other hand, if the attachment developed within the mother-infant relationship continues to change, new attachment styles will be established with the later attachment figures. In this case, the Internal Working Models also continue to change.

From the above referred theories and previous research, it would be interesting to explore the extent to which peer attachment is inherited by parental attachment. To give an extreme example, peer attachment is merely a copy of parental attachment or developed independently from parental attachment. It would also be valuable to explore how peer attachment stability influences mental health.

It is a general understanding that child gender cannot be dismissed in conducting studies of attachment with peers and parents. Pace, San Martini, & Zavattini and Gullone & Robinson demonstrated that peer attachment among males was more likely to be insecure than that among females [10 11]. Gorrese & Ruggieri conduct a meta-analytic review, and conclude that girls are more attached to their peers than boys [5]. These previous studies consistently demonstrate that compared to girls, boys are more attached to their parents. On the other hand, Tambelli, Laghi, Odorisio, & Notari demonstrate that female adolescents are more likely than male adolescents to mark high scores in Inventory of Parent and Peer Attachment (IPPA) for parents [12].

The impacts of peer attachment on adolescent mental health also have been the focus of attention in the realm of clinical psychology, as can be seen in Blos's concept of the Second Individuation Process, where an adolescent's tasks are to become emotionally independent from his/her parents and to renew the relationship [13]. According to Blos, during this period, peers take on family roles, and alleviate each other's sense of guilt that originates when they become independent from their parents' sense of values by sharing the same feelings.

Not only Blos's theory, but previous empirical research has also demonstrated significant impacts of peer attachment on mental health during adolescence and young adulthood. Schoeps, Mónaco, Cotolí, & Montoya-Castilla, targeting Spanish adolescents aged 12-15, have proven that peer attachment lowers emotional difficulties and conduct problems [14].

Some previous research examines the effects of parental attachment in addition to peer attachment on mental health. However, no consistent results have been obtained. There are some studies which show that peer attachment has significant effects on mental health, whereas parental attachment does not. For example, Teng, Griffiths, Nie, Xiang, & Guo demonstrate that peer attachment inversely predicts Internet Gambling Disorder among Chinese university students, whereas neither father attachment nor mother attachment does [15].

Some other studies conclude that peer attachment mediates between parental attachments and mental health. For example, Shkrollahzadeh, Mosavi, Hanis, & Zademohammadi show that peer attachment mediates the causal relationship between parental attachment and emotional maturity [16]. Wilkinson demonstrates that not only parental attachment, but also peer attachment, which is significantly influenced by parental attachment, has suppressing effects on depression via self-esteem [17]. In Japan, there has been no study to prove the mediating role of peer attachment between parental attachment and mental health.

Some studies examine gender differences in how peer attachment influences mental health. For example, Rajendran, et al. show that peer attachment predicts the well-being of Malaysian adolescents, and female adolescent well-being is more likely than male adolescent well-being to be impacted by peer attachment [18]. This means that peer attachment has a crucial role in maintaining female adolescent mental health.

This study is based on a questionnaire survey, with respondents aged 18 and over. Recently in Japan, studies have reported the absence of the second rebellious period [19, 20], and the phenomenon of extended adolescence has been given more attention on a global level [21]. This suggests that peer attachment significantly influences the mental health of not only high school students, but also college-aged students.

Uji and Kawaguchi demonstrate that the mental health of both male and female Japanese youth is influenced by paternal and maternal attachment [22]. If Bowlby is correct in his original attachment theory that attachment with any significant others (including peers during adolescence) is developed on the basis of maternal attachment followed by paternal attachment, it is possible that the impacts of parental attachment on the mental health of Japanese youth are not only direct, but also indirect by way of peer attachment, as shown by Shkrollahzadeh, et al. and Wilkinson [16,17]. This study aims at examining whether or not this peer attachment develops based on parental attachment, and whether or not peer attachment mediates between parental attachment and mental health for each respondent gender (the hypothesis model shown in Figure 1).

The IPPA was applied to assess college student attachment because it allows us to assess father, mother, and peer attachment, respectively. The original version of IPPA has been revised twice, resulting in its current version [23,24]. Detailed information regarding the revision process is summarized in Pace et al.'s article [10]. The current version of IPPA consists of 25 items each for the father, mother, and peer versions. The IPPA enables us to assess father and mother attachment separately, and explore their individual roles in developing attachment with peers. Each IPPA (father, mother, and peer) consists of three factors, Communication, Trust, and Alienation. The factor structure of the Japanese version of peer IPPA has not been proven, whereas the factor structure of the Japanese versions of father IPPA and mother IPPA have been proven [22]. Therefore, before examining the hypothesis model described in Figure 1, this study aims at exploring the factor structure of the Japanese version of peer IPPA, more specifically, evaluating whether or not the three-factor structure proposed by Armsden & Greenberg is valid.

The purposes of this study are

1. To confirm the three-factor structure of the Japanese-version of peer IPPA, as originally proposed by Armsden & Greenberg [23],
2. To see the reliability of the Japanese version of peer IPPA,

3. To see the gender difference in peer attachment level,
4. To see whether or not peer attachment evaluated by the peer IPPA is significantly influenced by parental attachment assessed by the parental IPPA, and
5. To separately examine whether or not peer attachment mediates between the parental attachment and mental health, for male and female Japanese youth, respectively.

Methods

Procedures

First year students who were enrolled in a medical college in Japan were solicited to attend a two-occasion questionnaire survey. Father and mother IPPAs were included in the first questionnaire. Peer IPPA and Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM) to assess their mental health (explained later) were included in the second questionnaire. The interval between the first and second questionnaire was six months. Among the 792 who gave consent to attend the survey, 433 (men/women=149/284, mean age/SD= 20.1/5.0) who completed every item of these inventories were the target of analysis. Voluntary participation and anonymity were guaranteed. The protocol of this study was approved by the Institutional Review Board.

Inventories

Japanese version of parental IPPA

The Japanese versions of father and mother IPPAs were used to assess father and mother attachment. Both IPPAs have been proven to have the three-factor structure model [22]. They assess the stability of attachment with father and mother on a 5-point Likert scale (1 being the least and 5 being the most applicable). Each Japanese version of IPPA consists of 24 items (8 Communication, 10 Trust, 6 Alienation). The higher the Communication and Trust scores, the more stable an individual's attachment with his/her parents, whereas the higher the Alienation score, the less stable an individual's attachment with his/her parents.

Japanese version of peer IPPA

The Japanese version of peer IPPA was applied to assess peer attachment. Its factor structure has not been confirmed. As with the father and mother IPPAs, it rates the stability of peer attachment on a 5-point Likert scale (1 being the least and 5 being the most applicable). As with the original version of father and mother IPPAs, the original version of peer IPPA has the three-factor structure, Communication, Trust, and Alienation. Peer IPPA has 25 items with 8 Communication items, 10 Trust items, and 7 Alienation items. As with the parental IPPAs, the higher scores in Communication and Trust indicate higher stability of peer attachment, while a higher score in Alienation indicates lower stability of peer attachment.

CORE-OM [25,26]

As noted, CORE-OM was used to evaluate the respondents' current mental health. It is a 34-item questionnaire, including symptomatic problems, life functioning, psychological well-being, and, risk to self and others. Each participant was instructed to choose the number of the answer that best applied to him/her, 5 being the most and 1 being the least applicable. The higher score indicates more seriously impaired mental health.

Statistical analyses

CFA was used to confirm the factor structure of the Japanese version of IPPA for peers. Cronbach alpha was calculated to confirm internal consistency in each of the three subscales. SEM was conducted to evaluate whether or not the peer attachment is significantly influenced by parental attachment, and also whether or not the peer attachment mediates between parental attachment and current mental health. SPSS 29.0 and Amos 29.0 were used for these statistical techniques.

Results

Factor structure of peer IPPA

At first, CFA for each subscale was conducted to confirm that each subscale has a one-factor structure model. The compatibility of the data to the model is shown in Table 1, indicating acceptable fitness levels. Every item in Communication and Trust of the original English version of IPPA was applied to Communication and Trust in the Japanese version of IPPA. Item 9 "I feel the need to be in touch with my friends more often" was excluded from Alienation, because its factor-loading on the Alienation was relatively small, and worsened the compatibility of the data to the one-factor structure model. Thus, a 24-item peer IPPA was tentatively determined to be the Japanese version of peer IPPA for assessing validity and reliability.

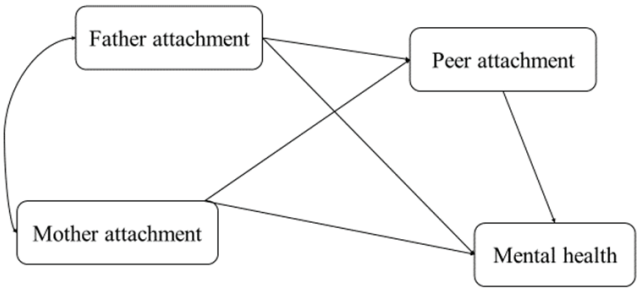

Figure 1. *Hypothesis model on direct pathway from Father and Mother attachment to Mental health, and indirect pathway via Peer attachment*

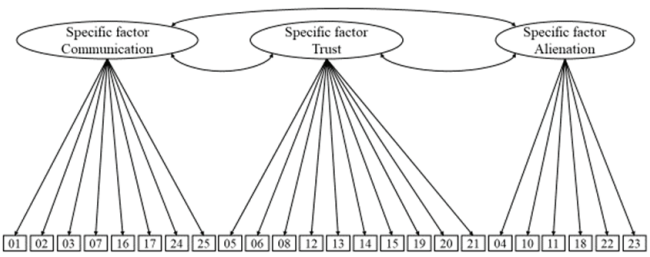

Figure 2. *Three-factor model*
Note: Numbers in the observed variables refer to those of peer IPPA items.

Table 1. *CFAs for whole peer IPPA and subscales*

One factor model of each peer IPPA subscale				
	CFI	RMSEA	χ2/df	AIC
Communication subscale	.992	.047	2.70	80.43
Trust subscale	.988	.050	2.92	135.93
Alienation subscale (item 9 excluded)	.996	.025	1.47	38.84
Three factor model of whole peer IPPA				
	CFI	RMSEA	χ2/df	AIC
Peer IPPA (item 9 excluded)	.952	.052	3.07	842.14
Bi-factor model of whole peer IPPA				
	CFI	RMSEA	χ2/df	AIC
Peer IPPA (item 9 excluded)	.966	.045	2.60	724.32

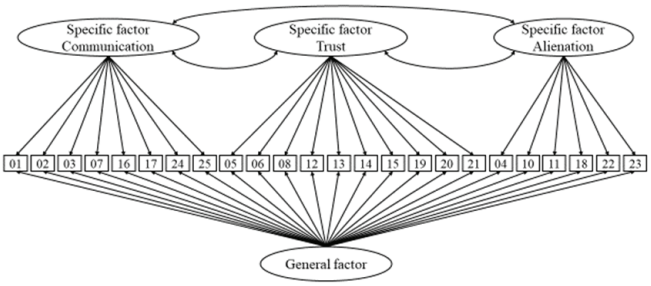

Figure 3. *Bi-factor model*
Note: Numbers in the observed variables refer to those of peer IPPA items.

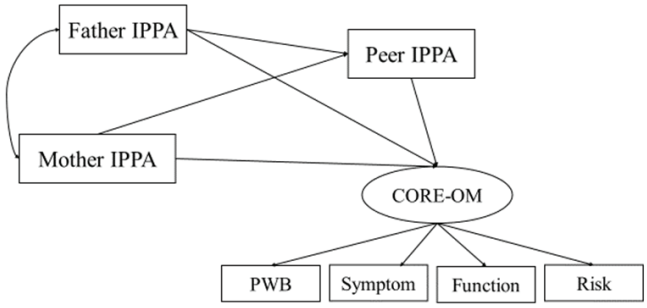

Figure 4. *Path model for SEM*

We conducted CFA for the 24-item peer IPPA with item 9 excluded, to confirm its three-factor structure (Figure 2), resulting in an acceptable, but not desirable compatibility level (Table 1). Therefore, we further explored a modified model with a better compatibility level, and finally arrived at a bi-factor model with one general factor and three specific factors (Figure 3). The compatibility of the model is shown in Table 1.

Cronbach's alpha

Cronbach's alpha was calculated for the three subscales and the entire 24-item peer IPPA, because every item was proven to have a significant factor-loading on one of the three specific factors in addition to the general factor. Cronbach's alpha reached favorable levels in all three subscales as well as the whole scale (Table 2). It is interesting to note that Cronbach's alpha level of the whole scale is higher than those of any of the subscales.

Gender differences

Gender differences in peer IPPA subscale scores were assessed by the t-test (Table 3). Female respondents were more likely than male respondents to mark high scores in Trust and Communication and a low score in Alienation, which meant that female respondents were more stably attached to their peers..

Correlations between father and mother IPPA subscale scores, peer IPPA subscale scores, and CORE-OM score

Pearson correlation coefficients were calculated (Table 4). Father, mother, and peer Communication and Trust scores significantly correlated with the CORE-OM score with positive values, whereas father, mother, and peer Alienation scores inversely correlated with the CORE-OM score. Peer Communication, Trust, and Alienation scores significantly correlated with each corresponding father and mother IPPA subscale score with positive values.

Pathway from father and mother attachment on mental health via peer attachment

We conducted SEM to examine the mediating role of peer attachment between parental attachment and mental health for each gender, respectively (Figure 4). As the 24 items of the Japanese version of peer IPPA shared the general factor (Figure 3, Table 1) and Cronbach's alpha of the IPPA was favorable (Table 2), we used the total score of the 24 peer IPPA items as the peer attachment score. The items in the subscale Alienation, unlike those in Communication and Trust, are inversely scored when evaluating attachment levels. Thus, we reversed each Alienation item score when calculating the total peer IPPA score.

Table 2. *Cronbach's Alpha of whole peer IPPA and its subscales*

	Items	Cronbach's Alpha	
Communication			
1	I like to get my friend's point of view on things I'm concerned about.		
2	My friends can tell when I'm upset about something.		
3	When we discuss things, my friends care about my point of view.		
7	My friends encourage me to talk about my difficulties.	.85	
16	My friends help me to understand myself better.		
17	My friends care about how I am feeling.		
24	I can tell my friends about my problems and troubles.		
25	If my friends know something is bothering me, they ask me about it.		
Trust			
5R	I wish I had different friends.		
6	My friends understand me.		
8	My friends accept me as I am.		
12	My friends listen to what I have to say.		.90
13	I feel my friends are good friends.	.87	
14	My friends are fairly easy to talk to.		
15	When I am angry about something my friends try to be understanding.		
19	I can count on my friends when I need to get something off my chest.		
20	I trust my friends.		
21	My friends respect my feelings.		
Alienation			
4	Talking over my problems with friends makes me feel ashamed or foolish.		
10	My friends don't understand what I'm going through these days.		
11	I feel alone or apart when I am with my friends.	.74	
18	I feel angry with my friends.		
22	I get upset a lot more than my friends know about.		
23	It seems as if my friends are irritated with me for no reason.		

Notes: "Item number" refers to that in the original version developed by Armsden, & Greenberg (1987). "R" stands for reverse, as in IPPA 03R, IPPA 06R, and IPPA 09R.
** p< .01

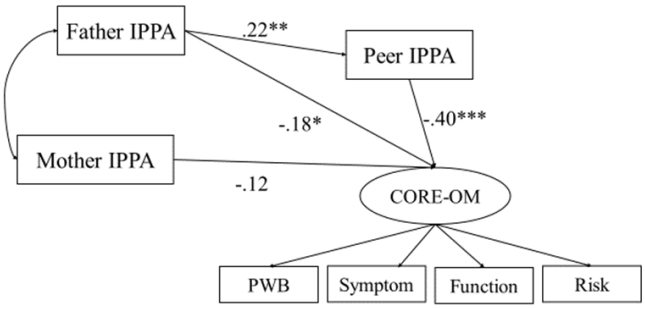

Figure 5. *Result of SEM among male respondents*
Numbers in the figure are standardized causal coefficients.
**** p< .001, ** p< .01, * p< .05*

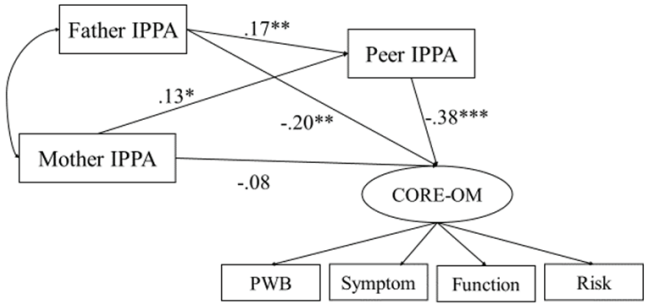

Figure 6. *Result of SEM among female respondents*
Numbers in the figure are standardized causal coefficients.
**** p< .001, ** p< .01, * p< .05*

***Table 3**. Gender differences in all three subscales in peer IPPA*

	Mean (SD) male/Mean (SD) female	t value
Peer Communication	16.8 (6.4)/21.5 (6.0)	-7.46***
Peer Trust	27.6 (8.1)/32.5 (7.4)	-.6.36***
Peer Alienation	6.4 (4.8)/5.1 (3.7)	2.96**

*** p< .001, ** p< .01

***Table 4**. Pearson correlations between father and mother IPPA subscale scores, peer IPPA subscale scores, and CORE-OM score*

	Father Com	Father Trust	Father Alien	Mother Com	Mother Trust	Mother Alien	Peer Com	Peer Trust	Peer Alien	CORE-OM
Father Com										
Father Trust	.72**									
Father Alien	-.49**	-66**								
Mother Com	.38**	.27**	-.17**							
Mother Trust	.31**	.35**	-.27**	.80**						
Mother Alien	-.22**	-.30**	.47**	.52**	-.67**					
Peer Com	.10*	.10*	.03	.19**	.15**	-.03				
Peer Trust	.14**	.19**	-.11*	.15**	.19**	-.13**	.77**			
Peer Alien	-.12*	-.20**	.21**	-.12*	-.18**	.25**	-.11*	-.35**		
CORE-OM	-.27**	-.33**	.30**	-.21**	-.34**	.33**	-.15**	-.32**	.46**	

We conducted SEM for male and female respondents, respectively (Figures 5, 6). The model in which the causal coefficient from mother IPPA to peer IPPA was defined to be 0 among male respondents showed the best compatibility level (CFI: .994, RMSEA: .026, $\chi 2$/df: 1.30, AIC: 98.0). Both male and female respondents' mental health was directly influenced by father, mother, and peer attachment levels. Among them, peer attachment had the most intense impact on mental health, and mother attachment had the weakest impact on mental health.

Peer attachment level was found to be influenced by father- but not mother attachment levels among male respondents, whereas among female respondents, peer attachment level was found to be influenced by both parent attachment levels (though mother attachment had less influence than father attachment). As a result, peer attachment had mediating roles between either of, or both parent attachment levels and mental health. This means that not only direct impacts but also indirect impacts of parental attachment on mental health via peer attachment were proven.

Discussion

The main findings of this study were that the Japanese version of peer IPPA, with item 9 ("I feel the need to be in touch with my friends more often") excluded from the original version, has a bi-factor model, and while every subscale internal reliability evaluated by Cronbach's alpha was desirable, the whole scale internal reliability was even better. Furthermore, female respondents' peer attachment was more stable than that of male respondents. For both male and female respondents, peer attachment was found to have significant impacts on their mental health. However, there was a slight gender difference regarding whether or not the peer attachment was influenced by both parents, i.e., among males, its platform was built by attachment only to the father, whereas among females, it was built by both father and mother attachment. We would like to discuss each finding, one by one.

First, the CFA results should be discussed. The bi-factor model we demonstrated does not necessarily negate the original three-factor model proposed by Armsden & Greenberg (1989) because every subscale in the original IPPA was proven to have the one-factor structure, and furthermore, three factors in the original scale still exist as the specific factors in our bi-factor model. The only difference between the original and Japanese versions of peer IPPA was that the bi-factor model had a general factor shared by every peer IPPA item except item 9. Combined with the fact that the Japanese version of peer IPPA showed a desirable Cronbach's alpha level, it is possible to use the total score of the 24 Japanese-version IPPA items as the peer attachment level in future studies.

We next need to discuss why item 9, "I feel the need to be in touch with my friends more often" was excluded from the Japanese version of peer IPPA. It is probable that English and Japanese nuances impacted the meaning of this sentence. In English, as categorized in the Alienation subscale, this sentence indicates distance between an individual and his/her peers. In Japanese it sounds as though an individual is especially fond of his/her peers and wants to be even closer.

The third discussion should be the desirable internal consistency that was found using Cronbach's alpha in every peer IPPA subscale. This, together with the previously discussed fact that every subscale had a one-factor structure, suggests the probability that one or two subscale(s) will be used in future studies to alleviate respondent burden. Another finding, that whole scale internal reliability was even better than any of the

three subscales, means that the total score of peer IPPA can be used as peer attachment stability level. As a result, the usage of this scale was broadened.

As expected, young adult mental health was most affected by peer attachment. It was also found that, regardless of the respondent gender, father attachment was more likely than mother attachment to influence his/her mental health. If the respondents had been children or young adolescents, the mother attachment would have had more intense impacts on their mental health. Mother attachment did not play a role in developing male peer attachment, resulting in the lack of its indirect impacts on the males' mental health by way of peer attachment. On the other hand, mother attachment did play a role in the development of peer attachment for female respondents, though to a lesser level than father attachment. Thus, the female respondents' mother attachment had indirect impacts on the mental health via peer attachment. These findings mean that the mother attachment is more important in maintaining stable peer attachment as well as sound mental health for female young adults, than male young adults.

Needless to say, the above findings do not indicate that the peer attachment is a copy of parental attachment. That is to say, considerable parts of peer attachment are not affected by parental attachment. It suggests the possibility of building a new and unique attachment pattern with a new real object, e.g., a companion he/she meets.

Limitations of this study should be mentioned here. First, it is assumable that respondent evaluation of peer, father, and mother attachment are significantly influenced by his/her current mental health. If the current mental health is favorable, the evaluation of attachment may tend to be secure. In the same way, if the current mental health is poor, the evaluation may be insecure. Second, although the development of peer attachment comes after that of parental attachment, the nature of peer attachment can work the other way around and influence that of parental attachment. For example, when an individual develops a secure (insecure) attachment with his/her peers, the internal working model, by being revised, improves (worsens) his/her evaluation of parental attachment.

Finally, how the results of this study can be applied to future studies and clinical settings should be mentioned. As explained, researchers can flexibly choose either one or two subscales or the whole scale depending on the situations. Clinically, it is important to evaluate the parental as well as peer attachment styles of young adults with mental health disorders, and for those with insecure attachment, to stabilize the attachment by giving psychotherapeutic intervention, i.e., revising the internal working model.

Conclusion

The Japanese version of IPPA was proven to have a bi-factor structure. Peer attachment, developed based on one or both of the paternal and maternal attachment, had significant impacts on mental health among both male and female Japanese youth.

Acknowledgments

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Conflict of Interest

There is no conflict of interest to declare.

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