Child Ind Res (2015) 8:767–788
DOI 10.1007/s12187-014-9271-5

Measuring Specific Attachment Relationships of Mother, Father and Peer in Malaysian Adolescents

Nor Sheereen Zulkefly · Ross B. Wilkinson

Accepted: 12 October 2014 / Published online: 16 October 2014

Abstract The Inventory of Parent and Peer Attachment (IPPA) is the most widely used self-report measure of individual differences in adolescent attachment. However, the factor structure of this measure has not been replicated outside of the Western adolescent population. Using confirmatory factor analysis (CFA), the aim of this study is to explore the factor structure of the IPPA in Malaysian adolescents. A total of 2,040 school-going adolescents across urban and rural areas of Malaysia completed the 75 items of the IPPA Mother, Father and Peer forms. Contrary to Western findings, results revealed that the three factor structure of the original IPPA sets were not replicated in the Malaysian data. A different three-factor structure for the Parental scales and a two-factor structure for the Peer scale were found to best fit the data. Multigroup CFA (MGCFA) of the IPPA-Malay scales supported invariance of the structural model across age, gender and locality of adolescents. The results indicate that assumptions underlying the cross-cultural assessment of attachment relationships need to be examined. Future research is suggested to look into culturally valid instruments to investigate the adolescent attachment relationship beyond the Western context.

Keywords Inventory of parent and peer attachment · Adolescent · Parent · Peer · Attachment

1 Introduction

Adolescence is a transitional stage in human growth and development. In most cultures, this stage is generally recognized as a period between the onset of puberty and adulthood. During the transition, most adolescents experience rapid changes and development involving physical, emotional, cognitive, and social aspects of their life.

N. S. Zulkefly (✉)
Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia
e-mail: sheereen@upm.edu.my

R. B. Wilkinson
School of Psychology, The University of Newcastle, Callaghan, New South Wales, Australia

These vivid changes are often described as awkward and difficult for adolescents, particularly in terms of their attachment relationships with parents and peers, considering adjustments in psychological functioning.

Attachment is generally defined as the emotional bond developed between a child and a primary attachment figure (Ainsworth 1989). According to Ainsworth (1989), a secure attachment relationship provides the child with much comfort and security, thus creating a safe haven for the child to develop. On the other hand, an insecure attachment bond is described as a relationship that lacks security and comfort. Nevertheless, children with secure attachment relationships to both parents have a more positive emotional and social developmental outcome. Furthermore, children with secure attachment use their parents as a secure base for exploring their external world (Rothbaum et al. 2000).

Adolescent attachment differs from attachment during infancy or childhood. As young children, the primary attachment figures are parents. During adolescence, peer relationships start to develop as adolescents acquire an increased need for independence (Pearson and Child 2007). In other words, attachment during adolescence can be described as a decreased dependency on parents and an increased interest in peers. Past research suggests that there is a shift in attachment hierarchies during adolescence (Nickerson and Nagle 2005). Adolescents tend to seek their peers more than parents as a source for emotional and social support as they tend to face the same challenges or issues (Mayseless 2005).

Nevertheless, parents still remain as the most important attachment figures for adolescents as parents continue to provide emotional security throughout adolescence (Allen and Land 1999). This is consistent with the fundamental principal of attachment theory that emphasizes on the importance of continuity in attachment relationship with the primary caregiver throughout the lifespan (Ainsworth 1989; Bowlby 1982). Adolescents with secure relationships with their parents are more emotionally and socially competent, thus gaining a more positive and healthier social, emotional, and cognitive development (Engels et al. 2001; Laghi et al. 2011). In contrast, adolescents lacking secure relationships with parents are more anxious and feel unloved, which leads to poor emotional and social skills development (Simons et al. 2001). Additionally, adolescents with insecure relationships are prone to experience developmental hiccups and more psychological problems such as depression and anxiety (Shochet et al. 2008; Wilkinson 2004).

Various established measures have been developed to assess adolescents' attachment relationships to their parents and peers. One of the most frequently used and validated measures of attachment is the Inventory of Parent and Peer Attachment (IPPA) by Armsden and Greenberg (1987). This measure was developed using Western adolescent samples. Researchers argued on the suitability of using Western developed attachment measure in adolescents from Non-Western cultures. According to Rothbaum and colleagues (2000), self-report instruments on attachment may not be applicable to Asian cultures that are generally more collectivist in nature. Hence, this study aims to investigate the appropriateness of the IPPA in an Asian, specifically Malaysian, adolescent context.

2 Attachment Across Culture

There is limited amount of research focusing on the influence of culture on attachment relationships. Earlier research has argued that the fundamental principal of attachment is deeply rooted in Western ideas and values and may not be generalizable to other cultures (Rothbaum et al. 2000). This belief was supported by later research (Huiberts et al. 2006; Kenny et al. 2005; Wang and Mallinckrodt 2006) that found evidence of cultural influence on the attachment formation of children and adolescents, particularly regarding the extent of family and peer attachment relationships that differs with respect to cultural values and norms.

Literature has also documented that most adolescent attachment research is based on Western samples (Pearson and Child 2007). There is limited research available with regards to adolescent attachment in Non-Western societies, including Malaysia. The few existing Asian studies mostly used Chinese (e.g., Song et al. 2009), Taiwanese (e.g., Liu and Huang 2012), or Japanese (e.g., Matsuoka et al. 2006) adolescent samples. Moreover, past researchers have highlighted their concerns regarding the suitability of using Western adolescent attachment measures in a Non-Western context. Western measures may include different cultural contexts and experiences that may influence adolescent attachment in Western adolescents, but not adolescents from other backgrounds (Rothbaum et al. 2000; Trees 2006; Yap et al. 2014). Additionally, past researchers have questioned whether interpreting the results of Western measures used with non-Western participants yield accurate results (e.g., De Klerk 2008). More research is thus needed to determine the applicability of applying Western developed measures to an Asian adolescent population. Therefore, the aim of this study is to explore the suitability of using one of the most common adolescent attachment measures, IPPA, in Malaysia.

3 Adolescent Attachment in the Context of Malaysia

Malaysia is a multiracial and multiethnic country situated in the South East Asia. It consists of 13 states and three federal territories, and is separated by the South China Sea into two similarly sized regions (Peninsular Malaysia and Malaysia Borneo). Malaysia is reported to be the 43rd most populated country in the world, where the total population in 2011 exceeded 29.2 million, with over 20 million living on the Peninsula. In 2010, the Department of Statistics of Malaysia reported that 10 % or 2.6 million of the population were adolescents.

Like most of the Asian countries, adolescents in Malaysia are described as having collectivist characteristics, where interdependence, control of one's emotions, deference to the group, and parental authority are key features (Ishak 2000; Song et al. 2009). In addition, Malaysian adolescents uphold values that focus on harmonious interpersonal relationships, meeting one's social obligations, respect and obeying elders, fitting in and maintaining esteem and status as viewed by other members of one's social group (Song et al. 2009). For instance, these adolescents are not encouraged to express their opinions or feelings, and to conform to tradition as well as value filial piety more than their own self-interests and needs. Krishnan (2004) in his study found Malaysian adolescents as more socially introvert consistent with their upbringing to be less direct

and open in social interactions, and very cautious in expressing their feelings (Krishnan 2004). Similarly, an earlier study found that Malaysian adolescents have a more agreeable personality and are less extroverted and open compared to their counterparts in individualistic societies (Mastor et al. 2000). This difference in behaviour is probably due to the closer family bond and stronger cultural influences among the Malaysian adolescents (Ishak 2000).

Even though peers are reckoned as an important aspect in adolescent development, the strong emphasis on family and the encouragement to be interdependent rather than independent individuals in Asian culture, made parents to remain as crucial attachment figures surpassing peers. This is in contrast to Western adolescents, who are trained to be more independent outside the family system, thus allowing other attachment figures besides parents to influence their development. Nevertheless, past studies (Laible et al. 2000; Liu 2006; Wilkinson 2004) have provided evidence on the significant contributions of mother, father and peers to the psychological health and adjustment of both Asian and Western adolescents.

Although research on adolescents is growing in Malaysia, there are very few studies available on the attachment relationships of adolescents (Bao 2006; Ishak 2000; Ishak et al. 2010). Moreover, to the best of these researchers knowledge, there is no published research that explored the suitability of the IPPA, a well-known Western developed attachment measure of mothers, fathers and peers relationships in a sample of Asian, including Malaysian adolescents. Thus, this need was undertaken by the present study.

4 Brief Background on the Inventory of Parent and Peer Attachment (IPPA)

The Inventory of Parent and Peer Attachment (IPPA) was first developed by Armsden and Greenberg in 1987 using a sample of undergraduate adolescents in the United States. The original version of the IPPA contained two scales to measure parental and peer adolescent attachments, where each form contained 28 and 25 items, respectively.

A revised version was proposed by Armsden and Greenberg (1989) using two groups of undergraduate students between the ages of 16 to 20, with Caucasian heritage. The revised version of the IPPA uniquely measured both mother and father attachment relationships to their adolescents. The parental scale of the previous inventory was divided into two separate forms for maternal and paternal attachments. Each of these forms consisted of identical items with only the references to the mother or father as the difference. The revised IPPA now contains a total of 75 items equally distributed into the three forms i.e. mother, father and peers. This revised version of the IPPA is strongly recommended as it aims to distinguish the roles of each parent as well as the adolescent's relationships with their peers.

Each scale of the IPPA consisted of three domains: Trust, Communication, and Alienation. The Trust factor contained items that assessed the understanding and respect between adolescents and their parents and peers; the Communication factor had items measuring the perceived quality of communication, while the Alienation factor contained items measuring feelings of isolation and alienation. The internal consistencies for these three subscales were found to be high (Trust α=0.91, Communication α=0.91 and Alienation α=0.86). The IPPA further reported having good internal consistency with Cronbach's alpha coefficients of 0.72 and 0.91 for the Parent

and Peer scales respectively; and test-retest reliability with correlation coefficients ranging between 0.86 for peer attachment and 0.93 for parent attachment (Armsden and Greenberg 1987). Although in recent years an increasing number of research has used a shorter form of the IPPA rather than the original 75-item scale (Dixon 2007; Laible et al. 2000; Meeus et al. 2002; Vignoli and Mallet 2004; Wilkinson 2010), yet it provides evidence that the short form IPPA is a reliable assessment of the general quality of parents and peer attachments with high internal consistency.

Despite consisting of three dimensions, most attachment studies administered the IPPA as a one dimension scale, where total scores of the Trust, Communication and Alienation (scores reversed) were computed to indicate the degree of attachment to parents and peers (Dixon 2007; Fass and Tubman 2002; Mothander and Wang 2011; Puissant 2011; Song et al. 2009). This method of administration of the scale was following the recommendation by the authors who reported high intercorrelations between the three subscales. Even though the unidimensional model of the IPPA was more popularly used, there are concerns that it may not accurately measure the attachment system of adolescents (Vignoli and Mallet 2004). Results of recent studies investigating the psychometric properties of the IPPA are consistent with these concerns. For example, Pace et al. (2011) examined different models of the IPPA as proposed by literature on a sample of 1,059 Italian middle and high school students. These models were: the three-factor model (Trust, Communication, and Alienation; Armsden and Greenberg 1987), the two factor model (Trust-communication and Alienation; Johnson et al. 2003), and a single-factor model (Attachment Security; Armsden and Greenberg 1987). Results from Pace et al.'s (2011) study were consistent with other psychometric studies (Kocayörük 2010; Vignoli and Mallet 2004) that supported Armsden and Greenberg's (1987) original finding, where the three-factor model had the best fit with the dimensions of Trust, Communication and Alienation being strongly interrelated.

Even though past studies have documented findings on the psychometric properties of the IPPA, most were based on adolescents from a Western rather than Asian population. Furthermore, the few Asian studies that utilized the IPPA had mostly used the IPPA as a unidimensional scale (Baharudin and Zulkefly 2009; Mothander and Wang 2011; Song et al. 2009). In a Malaysian study, Baharudin and Zulkefly (2009) investigated the roles of mother and father attachments on the self-esteem and academic achievement of college students. Meanwhile, in a Chinese adolescent sample, Mothander and Wang (2011) investigated the relationships between perceived parental rearing, attachment and social anxiety. Similarly, in their study of 584 middle and junior high school students in China, Song and colleagues (2009) explored the relationships between adolescent attachment to parents and peers and self-evaluation. These studies highlighted the quality of attachment to parents and peers without going into much detail regarding the sub-dimensions (Trust, Communication and Alienation) of attachment. Further review on the attachment literature revealed the non-existence of any research investigating the psychometric properties of the IPPA in an Asian sample.

4.1 The Present Study

Given the existence of cultural and ethnic differences among Western and Asian adolescents, this study investigates the generalizability of the IPPA in measuring

adolescent attachment relationships in Malaysian adolescent sample. It is imperative to see whether the IPPA is generalizable across these cultures as culture remains a contextual factor that greatly influence the adolescents' attachment process (Song et al. 2009). Thus, this study is unique as it provides the much needed information regarding the psychometric properties and generalizability of the IPPA in a Malaysian culture. Additionally, this study aims to assess measurement invariance and compare latent means of the IPPA-Malay across gender, age and locality of adolescents. It is hypothesized that the component structure of the IPPA would differ between the Malaysian sample and its Western counterparts. Such differences would therefore reflect the unique distinctions in attachment in an Asian sample.

5 Method

5.1 Participants

This study involved 2,040 adolescents randomly selected from urban and rural high schools across five selected states in Malaysia. Adolescents were between 13 and 17 years old (Mean=14.35, SD=1.285). Out of this sample, more than half (56.1 %) were females while 43.9 % were males. Most of these adolescents were Malay (58.8 %); the rest were Chinese (13.2 %), Indian (10.6 %) and Aborigines (17.3 %).

5.2 Procedure

Prior to data collection, permission to conduct the study was obtained from the Ministry of Education Malaysia, State Education Departments and principals of each participating school. Following the requirement of informed consent and other research ethics, this study was approved by the Ethics Committee of Universiti Putra Malaysia (UPM). Participants completed a self-administered questionnaire regarding their socio-demographic backgrounds and relationships with parents and peers at their respective schools.

5.3 Measures

The full 75-item IPPA developed by Armsden and Greenberg (1989) was used in the present study. Participants completed 25 items for each of the Mother, Father and Peer scales that were translated into Bahasa Melayu using forward backward translation. A panel of professional native speakers of both languages who are fluent in English translated the IPPA to Malay. The translated instrument was then translated back into English by different professionals for content comparison purposes. A pilot test was conducted on 299 high school adolescents that had similar characteristics to the actual study sample. Based on the results from the pilot test, slight modifications were done to the items in the final questionnaire to help ease respondents in their comprehension.

The IPPA scale was rated on a 5-point scale. The scale displayed a reasonable level of internal consistency; Father scale (Cronbach's α=0.88), Mother scale (Cronbach's α=0.87), Peer scale (Cronbach's α=0.86). In terms of the IPPA subscales, the reliabilities varied from moderate to good. For the Father scale, the Cronbach's alpha for the

Trust, Communication and Alienation factors were 0.80, 0.77 and 0.69, respectively. For the Mother scale, the Trust and Communication factors had good reliabilities (Cronbach's α=0.79; 0.76), while the Alienation domain had moderate reliability with Cronbach's alpha of 0.67. The Peer scale showed moderate to good reliability on the three subscales as well, where Cronbach's alpha for the Trust, Communication and Alienation factors were 0.84, 0.86 and 0.59, respectively.

5.4 Analysis

The generalizability of the IPPA in a Malaysian sample was first examined using Confirmatory Factor Analysis (CFA). Several recommended fit indices were utilized to evaluate the stability of the factor structures (Hu and Bentler 2000; Kline 2005; Schumacker and Lomax 2004): chi-square (χ^2); the root mean square error of approximation index (RMSEA); the comparative fit index (CFI); the goodness of fit index (GFI). The suggested cut-off value indicating good fit for the RMSEA ranged from 0.05 or lower (Hu and Bentler 2000; Marsh et al. 2004), while the CFI and GFI values greater than 0.90 are indicative of an acceptable fit (Hu and Bentler 2000; Tabachnick and Fidell 2007).

Next, a psychometric investigation of the IPPA in a Malaysian sample was performed using both the Exploratory Factor Analysis (EFA) and CFA. Prior to conducting analyses, the study sample was split into two random groups (Group A=1,040; Group B=1,000). EFA was conducted on the first group, while CFA was conducted on the second group. Subsample creation was guided by the desire to cross-validate and test the stability of EFA results. Similar to Pace et al. (2011), this present study assessed fit statistics for several models (i.e., models revealed from EFA and from previous study).

Lastly, Multigroup CFA (MGCFA) was performed to test the measurement invariance of the IPPA-Malay across age, gender and locality of adolescents. Based on the suggestion of Milfont and Fischer (2010), three steps of analyses were performed on the IPPA-Malay Mother, Father and Peer scales. The first step is to examine the configural invariance (Model 1) by constraining the factorial structure across groups. If configural invariance is met, this means that the factors of the IPPA-Malay are equal across groups. Next, metric invariance (Model 2) was performed to test whether the factor loadings of items on each factor are similar across different groups. Lastly, scalar invariance (Model 3) was performed by constraining the intercepts of the observed variables on the latent factors. If scalar invariance is established, this indicates that individuals irrespective of group membership, have the same score on the latent construct and the observed variable. In order to evaluate invariance among different models, the differences in the CFI value (i.e., ΔCFI$\geq$0.01) was used as the recommended fit statistic. Therefore, a CFI decrease more than the recommended value suggests a significant change in model fit and lack of invariance across groups (Cheung and Rensvold 2002).

Additionally, this study assessed the latent mean differences across groups (i.e., age, gender and locality). In assessing the latent mean difference of the factor structures of the IPPA-Malay across male and female adolescents, the latent mean parameters of the reference group (i.e., male) was fixed to zero, while the parameters for the compared group (i.e., female) was freely estimated. Similar steps were performed to test the latent

mean differences across age and locality, where the younger adolescents and urban areas were chosen as reference groups, respectively.

6 Results

6.1 The Original Three-Factor Structure Confirmatory Factor Analysis

The generalizability of the factor structure of the IPPA proposed by Armsden and Greenberg (1989) was examined using CFA. Overall, results suggested that the three-factor model of Trust, Communication and Alienation by Armsden and Greenberg (1989) were not replicable in the sample of Malaysian adolescents. Table 1 presents the fit statistics of the IPPA-Mother, Father and Peer scales. All three scales were found to have an inadequate fit to the Malaysian data set as the fit indices were lower than the recommended value. These results suggest that the IPPA has different component structures between the Western and Malaysian adolescent samples.

As the three-factor IPPA proposed by Armsden and Greenberg (1989) was not generalizable in the Malaysian adolescent sample, a psychometric investigation to further explore the underlying factor structure of the IPPA Mother, Father and Peer scales were performed.

6.2 Exploratory Factor Analysis (EFA)

The 25 items of the IPPA were submitted to a principal axis factoring by a separate oblimin rotation for mother, father and peer attachments. This study found that the IPPA Mother scale consisted of a three-factor solution with the total variance being 45.93 %. Results are shown in Table 2. Among the 12 items on the first factor, seven were originally Communication items (5, 7, 15, 16, 19, 20, and 25) and five were Trust items (1, 12, 13, 21 and 24) from the authors of the original scale with loadings from 0.462 to 0.783. Six of the nine items (8, 10, 11, 17, 18 and 23) on the second factor belonged to the Alienation dimension, two items (6 and 14) belonged to Communication and the remaining item (9) belonged to the Trust dimension. These items were moderately loaded on the second factor from 0.341 to 0.585. Among the nine items in the third factor, five items (1, 2, 3, 4 and 22) were originally from the Trust domain, three items (10, 17 and 18) were from the Alienation domain and one item (20) was from the Communication domain. Items on this factor had loadings ranging from −0.328 to −0.623.

Table 1 Confirmatory factor analysis of the IPPA mother, father and peer scales

	Model	Df	χ^2	RMSEA	CFI	GFI
Mother	Armsden and Greenberg (1989) three-factor model	272	1238.46	0.06	0.87	0.89
Father	Armsden and Greenberg (1989) three-factor model	272	1356.99	0.06	0.87	0.89
Peer	Armsden and Greenberg (1989) three-factor model	272	1751.85	0.07	0.84	0.88

p <0.001

Table 2 Exploratory factor analysis of the IPPA mother scale

	Item	Original Domain	Secure	Anxious	Contentment
19.	My mother helps me to talk about my difficulties.	C	0.783		
21.	When I am angry about something, my mother tries to be understanding.	T	0.736		
16.	I tell my mother about my problems and troubles.	C	0.727		
25.	If my mother knows something is bothering me, she asks me about it.	C	0.712		
24.	I can count on my mother when I need to get something off my chest.	C	0.706		
7.	My mother can tell when I'm upset about something.	C	0.669		
15.	My mother helps me to understand myself better.	C	0.568		
5.	I like to get my mother's point of view on things I'm concerned about.	C	0.562		
12.	When we discuss things, my mother cares about my point of view.	T	0.562		
20.	My mother understands me.	T	0.556		−0.328
13.	My mother trusts my judgment.	T	0.505		
1.	My mother respects my feeling.	T	0.462		−0.382
8.	Talking over my problems with my mother makes me feel ashamed or foolish.	A		0.585	
23.	My mother doesn't understand what I'm going through these days.	A		0.561	
6.	I feel it's no use letting my feelings show around my mother.	C		0.553	
11.	I get upset a lot more than my mother knows about.	A		0.543	
18.	I don't get much attention from my mother.	A		0.438	−0.345
9.	My mother expects too much from me.	T		0.404	
14.	My mother has her own problems, so I don't bother her with mine.	C		0.341	
3.	I wish I had a different mother.	T			−0.623
22.	I trust my mother.	T			−0.622
2.	I feel my mother does a good job as my mother.	T			−0.611
4.	My mother accepts me as I am.	T			−0.553
17.	I feel angry with my mother.	A		0.339	−0.534
10.	I get upset easily around my mother.	A		0.433	−0.493

Loadings<0.30 are not shown

The numbers of the items are those of Armsden and Greenberg's (1987) original questionnaire

T trust, *A* alienation, *C* communication

Results showed that although the IPPA Mother scale had a similar number of factor structures with the original version of the IPPA (Armsden and Greenberg 1989) study, items loaded on each factor were different (see Table 2). Factor One consisted of a

combination of the Trust and Communication items that referred to the feeling of being safe and protected in the relationship. Factor One was renamed as Secure. Meanwhile, the second factor consisted of items from the Alienation and Communication domain and referred to the feelings of restlessness and worry about the attachment relationship. This factor was renamed as Anxious. Factor Three had items from the Trust and Alienation domain which mostly assessed the degree of satisfaction in the attachment relationship, and thus was renamed as Contentment.

For the IPPA Father scale, the study findings revealed a similar three-factor solution to that of Mother scale, which accounted for 45.41 % of the total variance (see Table 3). Specifically, Factor One, Two and Three had eigenvalues of 30.52 %, 8.60 % and 6.02 %, respectively. Items loaded on each factor were somewhat parallel to findings of the Mother scale. Factor One consisted of 12 items with loadings from 0.532 to 0.799, where seven items (5, 7, 15, 16, 19, 20, and 25) were from the Communication dimension and five items (1, 12, 13, 21, and 24) were from the Trust dimension. Among the nine items in Factor Two, six items (8, 10, 11, 17, 18, and 23) were from Alienation, two items (6 and 14) were from Communication and one item (9) was from Trust. All items on this scale had loadings ranging from 0.345 to 0.597. The third factor had a total of ten items ranging from 0.311 to −0.67 where six items (1, 2, 3, 4, 9, and 22) belonged to the original Trust dimension, three items (10, 17 and 18) were from the Alienation dimension and one item (20) was from the Communication dimension. Comparable to the IPPA Mother scale, items loaded on the Father scale were different from that of the original IPPA (see Table 3). As the items loaded on the three factors were similar to that of the mother form, Factor One was renamed as Secure, Factor Two Anxious, and Factor Three Contentment.

In terms of the IPPA Peer scale, a two-factor solution was found with a total variance of 42.12 %, where Factor One and Two both had eigenvalues of 32.55 % and 9.57 %, respectively (see Table 4). This is in contrast to the three factor structure that was found by Armsden and Greenberg (1989). Factor One contained a total of 18 items, where seven items (1, 2, 3, 12, 13, 21, and 24) were originally from the Trust domain, nine items (6, 7, 14, 15, 16, 17, 19, 20, and 25) were from the Communication domain and two items (8 and 9) were from the Alienation domain. In view of the fact that these items measured the feeling of being in a safe and secure relationship, this factor was renamed as Secure.

As presented in Table 4, items loaded on this factor had loadings from 0.51 to 0.76. The second factor of the IPPA Peer scale consisted of seven items with loadings ranging from 0.411 to 0.648; three of which were Alienation (10, 11 and 18) and Trust (4, 22 and 23) items, respectively and one Communication item (5). In view that the items in this scale measured adolescents' degree of satisfaction in a relationship, this scale was named as Anxious.

6.3 Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis was performed on the factor structure of the IPPA-Malay obtained from the previous EFA using samples from Group B.

The results of the IPPA-Malay Mother, Father and Peer scales are presented in Table 5. As shown in the table, the three-dimension of the IPPA Mother scale obtained through maximum likelihood estimation procedures showed a good fit to the data as all

Table 3 Exploratory factor analysis of the IPPA father scale

Items	Original Domain	Secure	Anxious	Contentment
21. When I am angry about something, my father tries to be understanding.	T	0.779		
16. I tell my father about my problems and troubles.	C	0.750		
19. My father helps me to talk about my difficulties.	C	0.747		
25. If my father knows something is bothering me, he asks me about it.	C	0.723		
24. I can count on my father when I need to get something off my chest.	C	0.700		
7. My father can tell when I'm upset about something.	C	0.661		
15. My father helps me to understand myself better.	C	0.635		
12. When we discuss things, my father cares about my point of view.	T	0.628		
5. I like to get my father's point of view on things I'm concerned about.	C	0.611		
20. My father understands me.	T	0.605		0.316
13. My father trusts my judgment.	T	0.564		
My father respects my feeling.	T	0.532		0.311
23. My father doesn't understand what I'm going through these days.	A		0.597	
8. Talking over my problems with my father makes me feel ashamed or foolish.	A		0.576	
11. I get upset a lot more than my father knows about.	A		0.564	
6. I feel it's no use letting my feelings show around my father.	C		0.554	
10. I get upset easily around my father.	A		0.492	−0.413
18. I don't get much attention from my father.	A		0.434	−0.345
9. My father expects too much from me.	T		0.418	0.313
14. My father has his own problems, so I don't bother her with mine.	C		0.345	
I wish I had a different father.	T			−0.670
22. I trust my father.	T			0.624
I feel my father does a good job as my father.	T			0.616
My father accepts me as I am.	T			0.590
17. I feel angry with my father.	A		0.382	−0.500

Loadings<0.30 are not shown

The numbers of the items are those of Armsden and Greenberg's (1987) original questionnaire

T trust, *A* alienation, *C* communication

the fit statistics were within the recommended value. These results replicate and support the validity of the three-factor structure of the Mother scale obtained from the EFA. The three structures of the IPPA Mother showed moderate to high reliability where Cronbach's alpha for Anxious, Contentment and Secure were 0.67, 0.79 and 0.90,

Table 4 Exploratory factor analysis of the IPPA peer scale

Item	Original Domain	Secure	Anxious
15. When I am angry about something, my friends try to be understanding.	T	0.754	
16. My friends help me to understand myself better.	C	0.749	
6. My friends understand me.	T	0.748	
17. My friends care about how I am feeling.	C	0.745	
21. My friends respect my feelings.	T	0.727	
25. If my friends know something is bothering me, they ask me about it.	C	0.709	
3. When we discuss things, my friends care about my point of view.	C	0.671	
24. I can tell my friends about my problems and troubles.	C	0.668	
19. I can count on my friends when I need to get something off my chest.	T	0.663	
7. My friends encourage me to talk about my difficulties.	C	0.652	
20. I trust my friends.	T	0.650	
2. My friends can tell when I'm upset about something.	C	0.646	
8. My friends accept me as I am.	T	0.645	
13. I feel my friends are good friends.	T	0.631	
12. My friends listen to what I have to say.	T	0.619	
14. My friends are fairly easy to talk to.	T	0.598	
1. I like to get my friend's point of view on things I'm concerned about.	C	0.567	
9. I feel the need to be in touch with my friends more often.	A	0.548	
23. It seems as if my friends are irritated with me for no reason.	A		0.648
10. My friends don't understand what I'm going through these days.	A		0.594
18. I feel angry with my friends.	A		0.582
11. I feel alone or apart when I am with my friends.	A		0.559
22. I get upset a lot more than my friends know about.	A		0.536
4. Talking over my problems with friends makes me feel ashamed or foolish.	A		0.529
5. I wish I had different friends.	T		0.411

Loadings<0.30 are not shown

The numbers of the items are those of Armsden and Greenberg's (1987) original questionnaire

T trust, *A* alienation, *C* communication

respectively. The correlations between the factors were found to be somewhat moderate. The Secure factor was negatively correlated at a moderate level to Contentment (r=−0.67) and Anxious (r=−0.40), while a significant positive relationship (r=0.41) was found between Anxious and Contentment. This tends to suggest that the three dimensions of the Mother scale are clearly differentiated.

Next, the three-factor model of the Mother scale was compared to Johnson et al.'s (2003) two-factor model. Generally, results of the two-factor model demonstrated less desirable fit. The two-factor model of Trust (consisting of items from the Trust and Communication from the original scale) and Alienation proposed by Johnson et al.'s (2003) revealed an inadequate model fit with χ^2=2249.65, df=274, p<0.001; CFI=

Table 5 CFA of the mother, father and peer scales of the IPPA-Malay

	Model	Df	χ^2	RMSEA	CFI	GFI
Mother	Three-dimension oblique model	265	777.69	0.04	0.93	0.94
	Johnson et al. (2003) two-factor model	274	2249.65	0.06	0.87	0.90
Father	Three-dimension oblique model	265	793.35	0.05	0.94	0.94
	Johnson et al. (2003) two-factor model	274	2463.57	0.06	0.87	0.86
Peer	Two-dimension oblique model without error covariance	274	1400.66	0.06	0.86	0.89
	Two-dimension oblique model with error covariance	265	983.20	0.05	0.92	0.92
	Johnson et al. (2003) two-factor model	274	3412.65	0.08	0.83	0.87

p <0.001

0.87; GFI=0.90; RMSEA=0.06). Based on the model comparison, it can be suggested that the three-factor structure of the IPPA-Malay Mother is a better fit and appropriate to be used in the sample of Malaysian adolescents.

Similar procedures were conducted on the IPPA Father scale. Results showed that the three-dimension oblique Father scale was a good fit to the data as all the fit statistics were within the suggested range. Likewise with the results of CFA on the Mother scale, these fit statistics support the validity of the three-factor structure of the father scale obtained earlier in the EFA. The internal reliability for the Contentment, Anxious and Secure factors were also found to be between the range of moderate to high (Cronbach's α=0.60, 0.68, and 0.91). In addition, the results showed that the correlations between factors were moderate. Factors Anxious and Contentment were positively correlated (r=0.37), and these two factors were found to be negatively related with Secure (r=−0.37 and −0.67, respectively).

The CFA results from the Father scale was then compared to the two-factor model from previous study (Johnson et al. 2003). The two-factor model indicated a relatively poor model fit with χ^2=2463.57, df=274, p<0.001; CFI=0.87; GFI=0.86; RMSEA=0.06. These results suggest that the three-factor structure of the IPPA-Malay Father is a better fit for the Malaysian adolescents sample compared to the other model of IPPA.

With regard to the IPPA-Malay Peer scale (see Table 5), the two-factor model was found to have a less desirable fit to the data where the fit statistics of the CFI and GFI were slightly below the recommended value of 0.90. Based on the modification indices, the fit of the model could be improved by taking into account covariance in some of the error terms within the Secure factor. The solution indicated that error between items 2 and 3, items 13 and 14, items 16 and 17, items 20 and 21, and items 24 and 25 should be correlated. As the suggested covariance had common cause and did not compromise the theoretical integrity of the model, the paths were freed. The two-structure model was thus evaluated. As presented in Table 5, the inclusion of these new parameters improved the fit of the two-dimension model χ^2=983.50, df=265, p<0.001; CFI=0.93; GFI=0.93; RMSEA=0.05. High internal reliability were obtained, where the alphas for the Secure and Anxious are 0.89 and 0.88, respectively. The correlations between the latent variables of the two-dimension model (Secure and Anxious) were significantly, albeit poorly correlated (r=−0.10).

In terms of model comparison, the two–factor model proposed by Johnson et al. (2003) was tested using the Malaysian data. The two-factor model resulted in a poor model fit as well. Fit indices were found to be below the acceptable fit value, χ^2= 3412.65, df=274, p<0.001; CFI=0.83; GFI=0.87; RMSEA=0.08. Based on results of the CFA, the two-factor structure (i.e., Secure and Anxious) of the IPPA-Malay Peer scale was found to be a better fit to the Malaysian data set compared to the previously established models of the IPPA. Therefore, it can be suggested that IPPA-Malay Peer scale is appropriate to be used in a sample of Malaysian adolescents.

6.4 Descriptive Statistics

Table 6 presents the descriptive statistics of the overall scores for the IPPA-Malay Mother, Father and Peer scales and the subscales scores for Secure, Contentment and Anxious, given separately for gender (male and female), age (13–15 years old and 16–17 years old), and locality (urban and rural). Based on Kline's (2005) suggestions in determining normality for large samples, the thresholds for skewness and kurtosis are 3.0 and 10.0, respectively. Results indicate that each of the scales and subscales of the IPPA-Malay are approximately normally distributed.

6.5 Measurement Invariance

The IPPA-Malay Mother, Father and Peer scales were tested across gender (male vs. female), age (younger vs. older) and locality (urban vs. rural) of adolescents. Prior to analyses, the age of the respondents were split into two groups: younger (13–15 years old) and older (16–17 years old) adolescents. The first step in MGCFA involved examining the configural invariance. As presented in Table 7, Model 1 of the IPPA-Malay Mother, Father and Peer scales had adequate fit with the data supporting the configural validity across sex, age and locality of adolescents. Similarly, results of the metric invariance revealed that Model 2 had adequate fit statistics across all three groups. This is further supported by the differences in the CFI value between Model 2 and Model 1 of the three scales (Mother, Father and Peer) that did not exceed 0.01. Lastly, scalar invariance was examined. Results indicated that Model 3 of the three IPPA scales had an overall goodness-of-fit indices. Moreover, the differences of the CFI value between Model 3 and Model 2 across all three groups supported scalar invariance. Thus, it could be concluded that the factor structures of the IPPA-Malay was similar across gender, age and locality of the Malaysian adolescents.

6.6 Latent Mean Differences

The critical ratio (CR) index was used to evaluate the differences between latent means (Tsaousis and Kazi 2013). Critical ratio (estimate/standard error) employs z-statistics in order to test whether the estimate is statistically different from zero. It is recommended that the statistical CR value needs to be bigger than±1.96 before rejecting the hypothesis. Values obtained as positive will indicate that the compared group has higher scores from the reference group.

Results from the analysis on the IPPA-Malay Mother scale showed that females had lower scores than males in Secure (CR=−2.41), but higher scores in Anxious (CR=

Table 6 Means, skewness and kurtosis of the scores for the IPPA-Malay scales

IPPA-Malay	M(SD)	Skewness	Kurtosis	M (SD)	Skewness	Kurtosis
	Male			Female		
Mother scale						
Total	93.46(13.70)	−0.582	0.617	91.69(15.62)	−0.620	−0.193
Secure	43.66(9.34)	−0.485	0.325	42.47(10.45)	−0.454	−0.27
Contentment	28.31(3.30)	0.210	2.474	28.46(3.07)	−0.024	1.133
Anxious	22.37(5.80)	0.210	0.326	23.06(6.10)	0.457	0.075
Father scale						
Total	90.89(14.26)	−0.568	0.626	87.71(16.21)	−0.470	0.161
Secure	41.14(9.72)	−0.383	0.014	38.48(10.87)	−0.243	−0.394
Contentment	31.15(3.94)	−0.339	3.548	31.04(3.78)	−0.406	1.975
Anxious	22.20(5.95)	0.450	0.325	22.65(6.16)	0.553	0.213
Peer Scale						
Total	81.67(12.78)	0.227	0.097	85.52(14.46)	0.056	−0.193
Secure	57.31(13.52)	−0.010	−0.077	61.47(13.91)	−0.132	−0.218
Anxious	17.06(4.93)	0.289	0.381	17.00(4.58)	0.183	0.034
	Younger			Older		
Mother scale						
Total	92.96(14.88)	−0.669	0.735	91.54(14.70)	−0.563	0.313
Secure	43.32(10.00)	−0.537	−0.003	42.39(9.94)	−0.388	−0.327
Contentment	28.45(3.26)	0.083	1.623	28.28(3.00)	0.076	2.318
Anxious	22.55(5.96)	0.470	0.274	23.15(5.98)	0.398	0.061
Father scale						
Total	89.90(15.32)	−0.567	0.133	87.62(15.58)	−0.484	0.100
Secure	40.15(10.51)	−0.376	−0.146	38.74(10.31)	−0.249	−0.351
Contentment	31.14(3.99)	−0.316	2.46	30.99(3.58)	−0.546	3.406
Anxious	22.16(5.96)	0.538	0.397	23.01(6.25)	0.452	0.069
Peer Scale						
Total	83.14(13.94)	0.198	−0.020	85.13(13.65)	0.102	−0.203
Secure	58.66(14.22)	−0.046	0.266	61.53(13.04)	−0.040	−0.252
Anxious	16.88(4.81)	−0.198	0.191	17.32(4.58)	0.192	0.351
	Urban			Rural		
Mother scale						
Total	92(14.89)	−0.476	0.185	92.89(14.77)	−0.764	0.961
Secure	42.83(9.88)	−0.362	−0.422	43.15(10.08)	−0.584	0.119
Contentment	28.53(3.15)	0.089	1.792	28.28(3.19)	0.088	1.879
Anxious	23.05(6.09)	0.369	0.031	22.50(5.86)	0.508	0.363
Father scale						
Total	88.80(15.77)	−0.50	0.188	89.41(15.17)	−0.573	0.550
Secure	39.74(10.50)	−0.337	−0.274	39.61(10.43)	−0.324	−0.185
Contentment	31.33(3.83)	−0.295	2.653	30.88(3.87)	−0.437	2.827
Anxious	22.83(6.26)	4.03	0.017	22.13(5.89)	0.605	0.555

Table 6 (continued)

IPPA-Malay	M(SD)	Skewness	Kurtosis	M (SD)	Skewness	Kurtosis
Peer Scale						
Total	83.25(14.34)	0.005	−0.130	84.28(13.46)	0.335	−0.118
Secure	59.29(14.18)	−0.127	−0.228	59.90(13.65)	−0.005	−0.173
Anxious	17.22(4.86)	0.302	0.394	16.86(4.63)	0.164	0.033

Table 7 Measurement invariance of the mother, father and peer scales of the IPPA-Malay

	Model	Df	χ^2	RMSEA	CFI	Model Comparison	ΔCFI
Male vs. Female							
Mother	1. Full configural invariance	534	1131.60	0.034	0.923	-	
	2. Full metric invariance	564	1189.97	0.033	0.920	2 vs. 1	0.003
	3. Full scalar invariance	589	1258.19	0.034	0.914	3 vs. 2	0.006
Father	1. Full configural invariance	532	1159.61	0.034	0.924	-	
	2. Full metric invariance	563	1206.29	0.034	0.922	2 vs. 1	0.002
	3. Full scalar invariance	588	1254.50	0.034	0.919	3 vs. 2	0.001
Peer	1. Full configural invariance	538	1376.17	0.040	0.911	-	
	2. Full metric invariance	563	1415.99	0.039	0.909	2 vs. 1	0.002
	3. Full scalar invariance	588	1493.14	0.039	0.904	3 vs. 2	0.005
Younger vs. Older Adolescent							
Mother	1. Full configural invariance	534	1131.65	0.033	0.924	-	
	2. Full metric invariance	564	1193.95	0.033	0.919	2 vs. 1	0.005
	3. Full scalar invariance	589	1229.75	0.033	0.918	3 vs. 2	0.001
Father	1. Full configural invariance	532	1123.36	0.033	0.929	-	
	2. Full metric invariance	563	1171.99	0.033	0.926	2 vs. 1	0.003
	3. Full scalar invariance	588	1209.42	0.033	0.925	3 vs. 2	0.001
Peer	1. Full configural invariance	538	1330.42	0.038	0.915	-	
	2. Full metric invariance	563	1377.04	0.038	0.913	2 vs. 1	0.002
	3. Full scalar invariance	588	1424.75	0.038	0.910	3 vs. 2	0.003
Urban vs. Rural							
Mother	1. Full configural invariance	534	1125.37	0.033	0.924	-	
	2. Full metric invariance	564	1188.26	0.033	0.920	2 vs. 1	0.004
	3. Full scalar invariance	589	1228.18	0.033	0.918	3 vs. 2	0.002
Father	1. Full configural invariance	532	1140.64	0.034	0.927	-	
	2. Full metric invariance	560	1215.21	0.034	0.921	2 vs. 1	0.006
	3. Full scalar invariance	585	1246.20	0.034	0.920	3 vs. 2	0.001
Peer	1. Full configural invariance	538	1382.48	0.040	0.911	-	
	2. Full metric invariance	563	1410.41	0.039	0.910	2 vs. 1	0.001
	3. Full scalar invariance	588	1445.06	0.038	0.909	3 vs. 2	0.001

2.62). There was no difference between males and females in Contentment. Results further revealed that there was no difference between younger and older adolescents in Secure (CR=−1.45), Contentment (CR=−0.42), and Anxious (CR=1.36). Similarly, there were no significant differences in the latent means across adolescents in urban or rural areas; Secure (CR=0.06), Contentment (CR=−0.65), and Anxious (CR=−1.14).

For the IPPA-Malay Father scale, results revealed that females had lower mean scores than males in Secure (CR=−3.74). On the other hand, there were no differences between females and males in Contentment (CR=−0.35) and Anxious (CR=0.93). In terms of comparing latent means across age groups, results indicated no statistically significant differences between younger and older adolescents in Secure (CR=−1.79), Contentment (CR=0.28), and Anxious (CR=1.92). The comparison of different locality groups in latent mean revealed that adolescents in the rural areas have lower mean scores than their counterparts in urban areas in Anxious (CR=−1.98). In contrast, no latent mean differences were found between adolescents in the rural and urban areas in Secure (CR=−0.27), and Contentment (CR=0.99).

The analysis on the IPPA-Malay Peer scale across different gender groups suggested that females had higher scores than males in Secure (CR=4.14). There was no difference between females and males in Anxious (CR=−1.44). Results also indicated that comparison of different age groups in latent means revealed significant differences. Specifically, older adolescents had higher means score compared to younger adolescents in Secure (CR=3.42). However, there was no significant difference between older and younger adolescents in Anxious (CR=0.71). In terms of latent mean differences across locality, results showed that adolescents in rural areas had lower scores than adolescents in urban areas in Anxious (CR=−2.01). In contrast, there was no statistically significant difference between rural and urban adolescents in Secure (CR=1.31).

7 Discussion

The present study explored the factor structures of the Inventory of Parent and Peer Attachment (IPPA) across Malaysian adolescents. A review of the literature revealed the scarcity of research exploring the factor structure of the Western developed attachment measure in a Non-Western context, specifically in an Asian adolescent population like Malaysia. It is important to investigate whether Asian adolescents who are brought up in a collectivist society that is built upon a complicated network of family systems involving hierarchy and status (Ishak 2000), have the same attachment systems as adolescents in Western cultures. Therefore, this paper is unique as it is the first study in Malaysia that investigates the suitability of using a well-known adolescent attachment measure in an Asian adolescent sample.

Generally, the findings presented here support the concern of the suitability of using the Inventory of Parent and Peer Attachment (IPPA) in a Non-Western society (Rothbaum et al. 2000). Results of the CFA performed on the IPPA (Armsden and Greenberg 1989) indicated that the original factor structure was an inadequate fit to the Malaysian data. Hence, further analyses (i.e. EFA and CFA) were performed to investigate and understand the underlying properties of the IPPA in a Malaysian sample. The results of the EFA revealed a three-factor structure (Secure, Anxious, and Contentment) best explained the Father and Mother scales, and a two-factor

structure (Secure and Anxious) for the Peer scale. CFA was then performed with the three dimensional models of the IPPA-Malay Mother and Father scales and two-dimensional Peer scale model to determine the IPPA's stability in a sample of Malaysian adolescents. The results revealed that the three-factor structure of the IPPA Mother and Father scales and two-factor structure of the Peer scales were stable across the Malaysian data set. This suggests that the IPPA-Malay Mother, Father, and Peer scales can apply to adolescents in Malaysia.

The results of the present study are inconsistent with those of previous established Western studies that explored the psychometric properties of the IPPA. For example, this study found that although the IPPA-Malay Mother and Father scales had similar factor structures to that proposed by Armsden and Greenberg (1989), items that loaded on each of the factors were not similar to the original factor structure of the IPPA. In fact, items on each factor of the IPPA-Malay parents' scales consisted of a combination items of the three dimensions of Trust, Communication and Alienation. Meanwhile, the IPPA-Malay Peer scale was found to consist of a two dimensional model which was clearly in contrast to Armsden and Greenberg's (1989) three dimensions of peer attachment. Scrutiny of the items on the IPPA-Malay Peer scale revealed that all items of the Trust and Communication factors from the original IPPA loaded on one factor, while items from the Alienation domain loaded on another factor. These factors were later renamed as Secure and Anxious, respectively. Similar results were obtained when the factor structures of the IPPA-Malay Mother, Father and Peer scales were compared to the two-factor model of Trust-Communication and Alienation (Johnson et al. 2003). Results revealed an inadequate model fit to the data. Therefore, it can be concluded that the previously established factor structures of the IPPA was not suitable for this particular Malaysian population.

The differences in psychometric properties of the IPPA in the Malaysian and Western samples indicates that Malaysian adolescents may have a different understanding of attachment concepts compared to adolescents from Western context. The nature of attachment in Asian cultures, which strongly emphasizes interdependence, socialisation, and in-group harmony. Therefore, adolescents tend to suppress their personal feelings and thoughts, and perceive their behaviour in relation to others' thoughts, attitudes, feelings and actions. Furthermore, Asian culture also promotes the greater reliance on parents as the main attachment figure throughout adolescents. By contrast, adolescents in the Western context are portrayed as independent (Zimmer-Gembeck and Collins 2003), and are able to express themselves without fear of rejection or abandonment from their significant others. In terms of attachment relationships, Western adolescents were found to decrease their reliance on parents and increase reliance on peers (Allen and Land 1999).

Besides differences in culture, age could possibly have an effect on the differences in psychometric properties between the Armsden and Greenberg's (1987) and Malaysian samples. The original IPPA was established on an older adolescent population (16 to 20 years) in college, while the current study tested the IPPA-Malay on high school adolescents ranging from 13 to 17 years. The age differences in the Malaysian sample suggests that the adolescents may vary in their psychosocial developmental achievement, thus could have different perspective on their relationships to their mothers, fathers and peers. A 13 year old adolescent may have a stronger attachment relationship

to parents as compared to a 17 year old adolescent who may be more attached to peers. Therefore, the findings from this study may need to be interpreted with caution.

Despite differences in the factor structure between the IPPA-Malay and the IPPA-Original, reliability test performed on each of its subscales and total (25 items) scales that is, of the IPPA-Malay Mother, Father and Peer, revealed moderate to high internal consistency. The reliability test for the Mother subscales (Secure, Anxious and Contentment) ranged from 0.67 to 0.90 whereas Fathers' subscales were from 0.60 to 0.91. For Peer subscales (Secure and Anxious) the Cronbach's alpha were 0.89 and 0.88, respectively. These results tend to imply that the IPPA-Malay is a reliable measure of adolescents' perception of attachment relationships to mother, father and peer in a Malaysian sample.

Results from the present study prompt the need to further examine the assumptions underlying the cross-cultural assessment of attachment in specific relationships. Future research should improve the assessment of adolescents' perception of parent and peer attachment in a Non-Western sample, particularly in Malaysia, by increasing the validity of the IPPA Malay, and especially its predictive validity, through longitudinal studies. Additionally, researchers are encouraged to look into culturally valid instruments to investigate adolescent attachment relationship beyond the Western context. Another possible improvement that could be done to increase the internal consistency of the Anxious and Contentment scales of the IPPA-Malay Mother and Father forms is by using more localized treatment, which includes revising the content and wording of the items to be more culturally appropriate. Additionally, future researchers may want to investigate the reasons why items measuring the other attachment domains of the original IPPA cluster together in a different component structures in the Malaysian adolescent sample. One plausible explanation could involve the technical components resulting from differences in cultures (Gorsuch 1997).

Future studies may additionally examine the role of ethnicity in the formation of specific attachment relationships of adolescents. Although in general Malaysians are collectivist in nature, the differences in parenting styles among the various ethnic races may contribute to any distinct attachment formation between adolescents and their parents and peers. Therefore, future research should address whether the attachment relationship systems of adolescents are consistent across diverse racial backgrounds. To begin with, future studies may want to examine measurement invariance of the IPPA-Malay across ethnic backgrounds of Malaysian adolescents. As the present study consists of predominantly Malay adolescents, future research would benefit from investigating whether the results from this thesis remain true for a Chinese or Indian adolescent population in Malaysia. Hence, future cross-cultural research in adolescent attachment will help provide an even greater understanding on the cultural influence on the adolescents' specific attachment to mothers, fathers and peers. In addition,

It is important to note that this study is not without limitations. One of the main concerns with regards to self-report measures are the accuracy of the information reported, as these measures depend fully on the respondents truthful answers to personal question of a sensitive nature. Furthermore, there is no method to verify the accuracy of the information given by the respondents. Additionally, the IPPA is a self-report questionnaire that may yield biased answers from the adolescents. There is a possibility that adolescents' answers may reflect a certain level of social or even family

desirability. However, the large sample size of the study can protect against the influences of potential random error related to self-reporting (Rothman 2002).

Despite having limitations, the present study is helpful in understanding adolescent attachment across cultures. In addition, this study adds to the gap of knowledge on the suitability of using a Western based attachment measure on adolescents from Non-Western population. Furthermore, this study provides evidence that a more culturally appropriate attachment measure may be better able to tap into the attachment relationships of adolescents with their mothers, fathers, and peers as Malaysian adolescents coming from different cultures than their Western counterparts may have a somewhat different attachment relationship with their parents and peers.

8 Conclusion

Although there is increasing research on adolescent attachment, particularly studies on the psychometric properties of the Inventory of Parent and Peer Attachment (IPPA), nearly all of the studies were conducted in the Western societies. The present study provide much needed information on generalizing the three-factor structure of the IPPA that is developed and mostly used in a Western sample, in a Non-Western context such as with Malaysian adolescents. This paper highlighted that cultural plays an influence in the formation of attachment in adolescents. Malaysian adolescents, regardless of their racial background, are more conformed to tradition; where elders are respected, obeyed and placed first rather than self. Thus, a culturally specific attachment measure would be more appropriate in measuring attachment relationships of adolescents in a Non-Western culture.

Acknowledgments The assistance of Professor Rozumah Baharudin as the head researcher of the "Benchmarking the Quality of Parenting Behavior and its Correlates to Adolescents Well-Being: Implications for Enhancing Human Capital Development" and fellow graduate students of the Department of Family Studies and Human Development, Faculty of Human Ecology, Universiti Putra Malaysia are gratefully acknowledged.

References

Ainsworth, M. D. S. (1989). Attachments beyond infancy. *American Psychologist, 44*, 709–716.

Allen, J. P., & Land, D. (1999). Attachment in adolescence. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 319–335). New York: Guilford Press.

Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: individual differences and their relationship to psychological wellbeing in adolescence. *Journal of Youth and Adolescence, 16*, 427–454.

Armsden, G. C., & Greenberg, M. T. (1989). *Inventory of parent and peer attachment: Revised manual. Unpublished revised version*. Seattle, Washington: University of Washington.

Baharudin, R. & Zulkefly, N.S. (2009). Relationships with Father and Mother, Self-esteem and Academic Achievement amongst College Students. *American Journal of Scientific Research,* (6), pp. 86–94.

Bao, K. B. (2006). *A Comparison of Attachment in Adolescents of Chinese Mainland, Malaysian Chinese and Malay.*

Bowlby, J. (1982). *Attachment and loss: Vol. I. Attachment*. New York: Basic Books.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 9*(2), 233–255.

De Klerk, G. (2008). Cross-cultural testing. In M. Born, C.D. Foxcroft & R. Butter (Eds.), *Online Readings in Testing and Assessment,* International Test

Department of Statistic Malaysia. (2010). *Population distribution and basic demographic characteristics*. Putrajaya, Malaysia: GPO.

Dixon, J. A. (2007). Predicting Student Perceptions of School Connectedness: The Contributions of Parent Attachment and Peer Attachment. *Open Access Dissertations, Paper 2*.

Engels, R. C., Finkenauer, C., Meeus, W., & Dekovic, M. (2001). Parental attachment and adolescents' emotional adjustment: the associations with social skills and relational competence. *Journal of Counseling Psychology, 4*, 428–439. doi:10.1037/0022-0167.48.4.428.

Fass, M. E., & Tubman, J. G. (2002). The influence of parental and peer attachment on college students' academic achievement. *Psychology in the Schools, 39*(5), 561–573.

Gorsuch, R. L. (1997). Exploratory factor analysis: its role in item analysis. *Journal of Personality Assessment, 68*(3), 532–560.

Hu, L.-T., & Bentler, P. M. (2000). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1–55.

Huiberts, A., Oosterwegel, A., Vandervalk, I. E., Vollebergh, W., & Meeus, W. H. J. (2006). Connectedness with parents and behavioural autonomy among Dutch and Moroccan adolescents. *Ethnic and Racial Studies, 29*, 315–330.

Ishak, N. M. (2000). Analysis of parental and peer attachment: a comparative study between Asian-American and Asian International students studying in American universities. *Jurnal Pendidikan, 24*, 16–28.

Ishak, N. M., Yunus, M. M., & Iskandar, I. P. (2010). Trust, communication and healthy parental attachment among Malaysian academically talented college students. *Procedia - Social and Behavioral Sciences, 9*, 1529–1536.

Johnson, L., Ketring, S., & Abshire, C. (2003). The revised inventory of parent attachment: measuring attachment in families. *Contemporary Family Therapy, 25*(3), 333–349. doi:10.1023/A:1024563422543.

Kenny, M. E., Griffiths, J., & Grossman, J. (2005). Self-image and parental attachment among late adolescents in Belize. *Journal of Adolescence, 5*, 649–664.

Kline, R. B. (2005). *Principles and practice of structural equation modelling* (2nd ed.). New York: The Guildford Press.

Kocayörük, E. (2010). A Turkish Adaptation of the Inventory of Parent and Peer Attachment: The Reliability and Validity Study. *Eurasian Journal of Educational Research, Summer*(40).

Krishnan, U. D. (2004). *Parent-adolescent conflict and adolescent functioning in a collectivist, ethnically heterogenous culture: Malaysia*. Columbus, Ohio: Ohio State University.

Laghi, F., Pallini, S., D'Alessio, M., & Baiocco, R. (2011). Development and validation of the efficacious self-presentation scale. *Journal of Genetic Psychology, 172*(2), 209–219.

Laible, D. J., Carlo, G., & Raffaelli, M. (2000). The differential relations of parent and peer attachment to adolescent adjustment. *Journal of Youth and Adolescence, 29*(1), 45–59.

Liu, Y.-L. (2006). Paternal/maternal attachment, peer support, social expectations of peer interaction, and depressive symptoms. *Adolescence, 41*(164), 705.

Liu, Y.-L., & Huang, F.-M. (2012). Mother-adolescent conflict in Taiwan: links between attachment style and psychological distress. *Social Behavior and Personality: An International Journal, 40*(6), 919–931.

Marsh, H. W., Hau, K. T., & Wen, Z. (2004). In search of golden rules: comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's findings. *Structural Equation Modeling, 11*(3), 320–341.

Mastor, K. A., Jin, P., & Cooper, M. (2000). Malay culture and personality. *American Behavioral Scientist, 44*(1), 95–111.

Matsuoka, N., Uji, M., Hiramura, H., Chen, Z., Shikai, N., Kishida, Y., & Kitamura, T. (2006). *Archives of Women's Mental Health, 9*, 23–29. doi:10.1007/s00737-005-0105-9.

Mayseless, O. (2005). Ontogeny of attachment in middle childhood. In Seibert, A.C. & Kerns, K.A. (2009). Attachment figures in middle childhood. *International Journal of Behavioral Development*, 33(4), 347–355.

Meeus, W. I. M., Oosterwegel, A., & Vollebergh, W. (2002). Parental and peer attachment and identity development in adolescence. *Journal of Adolescence, 25*(1), 93–106.

Milfont, T. L., & Fischer, R. (2010). Testing measurement invariance groups: applications in cross-cultural research. *International Journal of Psychological Research, 3*(1), 2011–2084.

Mothander, P. R., & Wang, M. (2011). Parental Rearing, Attachment, and Social Anxiety in Chinese Adolescents. *Youth & Society.*

Nickerson, A. B., & Nagle, R. J. (2005). Parent and peer attachment in late childhood and early adolescence. *The Journal of Early Adolescence, 25*(2), 223–249. doi:10.1177/0272431604274174.

Pace, C. S., San Martini, P., & Zavattini, G. C. (2011). 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.

Pearson, J. C., & Child, J. T. (2007). A cross-cultural comparison of parental and peer attachment styles among adult children from the United States, Puerto Rico, and India. *Journal of Intercultural Communication Research, 36*(1), 15–32.

Puissant, S. P. (2011). The contribution of social rank and attachment theory to depression in a non clinical sample of adolescents. *The Spanish Journal of Psychology, 14*(2), 832–842.

Rothbaum, F., Weisz, J., Pott, M., Miyake, K., & Morelli, G. (2000). Attachment and culture. *The American Psychologist, 55*, 1093–1104.

Rothman, K. J. (2002). *Epidemiology. An introduction*. Oxford: Oxford University Press.

Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to structural equation modeling* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

Shochet, I. M., Homel, R., Cockshaw, W. D., & Montgomery, D. T. (2008). How do school connectedness and attachment to parents interrelate in predicting adolescent depressive symptoms? *Journal of Clinical Child & Adolescent Psychology, 37*(3), 676–681. doi:10.1080/15374410802148053.

Simons, K. J. M., Paternite, C., & Shore, C. (2001). Quality of parent/adolescent attachment and aggression in young adolescents. *Journal of Early Adolescence, 21*, 182–203.

Song, H., Thompson, R. A., & Ferrer, E. (2009). Attachment and self-evaluation in Chinese adolescents: age and gender differences. *Journal of Adolescence, 32*(5), 1267–1286.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Allyn and Bacon.

Trees, A. R. (2006). Attachment theory: The reciprocal relationship between family communication and attachment patterns. In D. O. Braithwaite & L. A. Baxter (Eds.), *Engaging theories in family communication: Multiple perspectives* (pp. 165–180). Thousand Oaks, CA: Sage Publications, Inc.

Tsaousis, I., & Kazi, S. (2013). Factorial invariance and latent mean differences of scores on trait emotional intelligence across gender and age. *Personality and Individual Differences, 54*(2), 169–173. doi:10.1016/j.paid.2012.08.016.

Vignoli, E., & Mallet, P. (2004). Validation of a brief measure of adolescents' parent attachment based on Armsden and Greenberg's three-dimension model. *Revue Européenne de Psychologie Appliquée/ European Review of Applied Psychology, 54*(4), 2.

Wang, C. D., & Mallinckrodt, B. S. (2006). Differences between Taiwanese and US cultural beliefs about ideal adult attachment. *Journal of Counseling Psychology, 53*, 192–204.

Wilkinson, R. B. (2004). The role of parental and peer attachment in the psychological health and self-esteem of adolescents. *Journal of Youth and Adolescence, 33*, 479–493.

Wilkinson, R. B. (2010). Best friend attachment versus peer attachment in the prediction of adolescent psychological adjustment. *Journal of Adolescence, 33*(5), 709–717.

Yap, S., Baharudin, R., Yaacob, S., & Osman, S. (2014). Paternal and maternal involvement in Malaysian adolescents: test of factor structure, measurement invariance and latent mean differences. *Child Indicators Research, 7*(1), 193–208. doi:10.1007/s12187-013-9209-3.

Zimmer-Gembeck, M. J., & Collins, W. A. (2003). Autonomy development during adolescence. In G. R. Adams & M. Berzonsky (Eds.), *Blackwell handbook of adolescence* (pp. 175–204). Oxford: Blackwell Publishers.