Attachment the Construct: A Construct Validity
Study of Parent-Adolescent Attachment Measures

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Abstract

A dearth of research evaluating the psychometric properties of parent-child attachment measures has raised questions about the validity of scores when these self-report instruments are administered. The purpose of this study was to examine the construct validity of the scores produced by two parent-adolescent attachment measures on a sample of 200 adolescents grades eight through twelve who volunteered to take part in the project. The scores obtained from the 200 adolescents on the parent-child attachment questionnaires were analyzed using confirmatory factor analysis of the measurement models delineated by the authors of the scales. Structural equations modeling in LISREL was used to address the invariance of the factor structures for each attachment scale across the sex groupings. When comparing the correlation coefficients within and between the score from the IPPA, PAQ, RCMAS, and SDQ-II, the study generally supported the convergent and discriminant validity of the two attachment measures. However, results from the current sample failed to provide support for the factor structure of the IPPA and the PAQ, and the invariance of the measurement models across female and male participants. Taken together, results from the current study suggest that school psychologists or counsellors can use the total scores of the parent forms of the IPPA and PAQ in group or individual assessment as initial indicators of parent-child attachment and felt security. However, as with all assessments, the results should be interpreted in the context of information gained from other methods including interviews, observations, and self-reports measuring other constructs.
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that psychology bestowed to me, and the importance of training in an area that
would allow me to help and empower children.
Chapter One

Introduction

(Lorenz, 1935, as cited in Berndt, 1992, p. 218)

The study of attachment, as a psychological construct, can be dated back to the research of Konrad Lorenz in the 1930's. As one of the forebears of attachment, or "mother" as in his studies, Lorenz observed that baby ducks imprinted to the first moving object they saw after hatching. Harlow's classic studies with Zimmerman (1959) and Mears (1979) provided empirical support for the suggested innate attachment behaviours in animals, and the potential deleterious effects of separation, respectively. In most psychology textbooks on child development, the picture of Harlow and Zimmerman's wire monkeys provides an excellent visual representation of the purpose of bonding with a caregiver. The published study in 1959 demonstrated that the infant monkey required more than food, a physical need, to survive, as provided by the wire mother monkey. It spent most of its time with the soft terry cloth covered mother,
and to fulfill the emotional need of felt security it sought out the cloth covered mother when it was scared.

From these classic studies by Lorenz and Harlow, John Bowlby was able to identify the common ground shared by the constructs of imprinting and attachment. The definitions of these two concepts include proximity seeking behaviours to the caregivers and the need for felt security and accessibility, especially during anxious or fearful situations (Bowlby, 1973). Thus, the primary purpose of these behaviours is not physical or to obtain food, but emotional. It is suggested that these attachment behaviours are necessary for survival, and thus are innate and present across species regardless of the length of the critical period.

Unlike the baby ducks in Lorenz’ research who form a secure bond and recognize their primary caregiver immediately, human infants do not actually recognize their primary caregiver as different from other individuals until they reach four to eight months of age (Harris, 1986). Despite this, infants will seek out the comfort from others by smiling, gazing, crying, and grasping. These behaviours continue after the infant has reached the age of recognizing who is his/her mother and father, and engage in proximity seeking to the caregiver when in the presence of strangers. Research with infants and toddlers, such as those by Ainsworth, Blehar, Walters, and Wall (1978) using the strange situation, have focused upon the observable behaviours that characterize parent-child attachment.

However, given the need to understand the attachment patterns between a parent and a child during the life span, more current research has included the
development of self-report parent-adolescent attachment measures. These measures have been designed to examine the less observable characteristics, such as emotions, that characterize the adolescents who have different types of attachment bonds with their parent(s). Studies that have used the self-report measures have concluded that the type of attachment, or bond, that a parent develops with his/her child is related to an adolescent's present and future emotional and social well-being. For example, Armsden and Greenberg (1987) carried out a study among 86 college students to examine the relationship between parent and peer attachment and the students' psychological well-being. Using their newly developed Inventory of Parent and Peer Attachment (IPPA) to measure felt attachment by the students, the authors concluded that the reported scores on the Parent Attachment form accounted for 18 and 15 percent of the variances on the self-concept and life satisfactions measures, respectively. In addition, the quality of the attachments that the students felt they had with their parents and peers were statistically significant predictors, explaining 18 percent of the variance, of the students' depression and anxiety scores.

A subsequent study by De Jong (1992) used the same attachment measure, the IPPA, to examine the relationship between attachment to parent and peers and reported suicidality among 126 undergraduate students. Comparing three groups of students: (a) students who reported a history of suicide attempts and/or ideations, (b) students who reported symptoms of clinical depression, and (c) a control group, they found a statistically significant difference. The participants in group A reported lower attachment scores for their mothers and fathers as well as lower felt security in their present relations with
parents than the control group. The students reporting suicidal attempts and/or ideations also indicated that they felt their parents were currently emotionally unavailable to them at a statistically significantly higher level than the depressed students and the control group.

A study by Schneider and Younger (1996) reported somewhat mixed results in their examination of the relationship between parent-adolescent attachment and specific aspects of peer relationships among 63 grade ten students. Using the Inventory of Parent Attachment (IPA; Armsden & Greenberg, 1987), the authors found that contrary to their hypotheses, attachment to parents showed limited correlations with intimate aspects (quality of relationships) of peer relations, but was more related to time spent (quantity of relationships) with peers for some students. Contrary to what we would expect from attachment theory then, this study did not appear to support the suggestion that parental attachment plays an important role in how children form and problem solve in new relationships. At the same time, responses from the adolescents and parents showed that both positive (trust and communication) and negative (alienation) aspects of the IPA were positively associated to increased time spent with friends. These conclusions, although mixed, are likely limited by the small sample. Moreover, the internal consistency of the scores on the IPA was not reported for the current sample, which may have limited the validity of the scale in this study.

In summary, these more current research projects point towards the potential impact of a parent's attachment to his/her child on an adolescent's emotional health, including self-concept, depression, anxiety, suicidal attempts
and ideations, and peer relationships. Considering the breadth of potential correlates of parent-adolescent attachment, it seems reasonable to think of attachment as one of the building blocks for a youth's success. There is a need for educators and others to acknowledge and understand adolescent emotional health and support systems, and how these areas contribute to the students' achievement, social relationships, and learning.

The Research Problem

The history of attachment as a topic in psychological research is prominent. Considering the conclusions currently being made regarding the role of parent-adolescent attachment in an adolescent's psychological well-being and peer relationships, it is important that researchers are confident in the self-report instruments being used to measure attachment. However, the construct validity of attachment measures, specifically the convergent and discriminant validity of the commonly used self-report instruments, appears to be an area that is not well researched. Thus, it is difficult to ascertain whether or not the conclusions being drawn in different studies are based upon the measurement of the same construct, "attachment," and whether the differences in their findings are due to the validity of the measures used.

The reason for the dearth of validity support of these measures is twofold. To begin with, few studies use more than a single attachment measure. Thus, there is little opportunity to compare the results of one measure to another as evidence for the convergent validity of the measures. Secondly, Heiss, Berman, and Sperling (1996) published the only known construct validity study using self-report attachment measures. These authors asked college students to complete
five attachment scales including: the IPPA (Armsden & Greenberg, 1987), the Parental Attachment Questionnaire (PAQ; Kenny, 1987), the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979), the Attachment Style Inventory (ASI; Sperling, Berman, & Fagen, 1992), and the Continued Attachment Scale (CAS; Berman, Heiss, & Sperling, 1994). In addition, the participants were asked to complete five other scales that measured constructs such as loneliness, anxiety, and depression. However, support for the construct validity of the attachment measures is limited by the method of analysis and subsequent results and discussion provided in the published article.

Heiss et al. (1996) only provided information on the degree of relationship between the factors (using iterated principal factors methodology on the subscale scores), not the instruments, and the criterion scores of anxiety, loneliness, depression, and others. The failure to provide a correlation matrix using the scores obtained from the parent-child attachment and criterion measures, makes it difficult to ascertain which instruments appear to be more related to each other. If the scores from the attachment instruments correlate more highly with each other (convergent validity) than with the scores from the criterion measures (discriminant validity), then one can be more confident that the construct being measured is something different from anxiety, depression, and loneliness. In the absence of such evidence, one is left unsure of whether the self-report attachment instruments are measuring the same construct and different from the constructs of anxiety, etc. In addition, the authors did not provide an indication of the relationship between the composite scores of the attachment measures. Examining the shared variance among the composite scores of the measures
would provide additional validity information that is perhaps more meaningful given that the subscales within a measure are often highly intercorrelated, as suggested by Schneider and Younger (1996) in their discussion of the IPPA. Thus, the question of the construct validity of the self-report parent-adolescent attachment measures remains open to research. Specifically, there is a need to know how the parent-child attachment measures are related to each other (convergent validity) and other instruments that purport to measure different constructs (discriminant validity).

Using the scores from two attachment measures and two criterion measures, the relationships between the attachment measures and between the attachment and criterion measures can be compared. Additionally, confirmatory factor analysis and structural equation models will provide information on the validity of parent-adolescent attachment instruments. The parent-adolescent attachment measures used in the current study included the IPPA and PAQ. The criterion measures were the Revised Children's Manifest Anxiety Scale (RCMAS, Reynolds & Richmond, 1978) and the Self-Description Questionnaire - II (SDQII, Marsh, 1992).

The majority of the research using the IPPA and PAQ has taken place among older adolescents and college students. However, these measures were also designed to be administered to younger adolescents. Thus, the current study requested adolescents in grades eight through twelve to participate in the study.
Benefits

Ultimately, the goal of the research on parent-child attachment is to create an increased awareness among parents, schools, and the community. Support to foster the development and maintenance of a child’s attachment to his/her parent(s) can only be done when individuals recognize the importance of the parent-child bond, and how a weak bond can affect the child’s success and emotional well-being at home, in the community, and at school. However, the validity of the measures used in research must be established so that the studies are considered an accurate representation of the effects of secure and insecure parent-child attachments.

Evidence for the construct validity of the attachment questionnaires is also necessary for the correct identification of adolescents who have secure/insecure relationships with their parent(s). For the school psychologist or counsellor who is responsible for the emotional health of the students in the school, the identification and remediation of adolescents with emotional challenges is of primary concern. To this end, the professional must be confident that the measures will provide useful and accurate information. This same rationale is necessary when the school psychologist is asked to identify and suggest remediation strategies for children who are having difficulty learning due to a learning disability, cognitive, memory, or visual-motor deficits. The correct identification of a student’s emotional and academic challenges is paramount to increasing a student’s success in school, the community, and at home. Evidence of construct validity is fundamental to understanding the accuracy of identification.
In Messick's (1995) discussion of construct validity, he helps the researcher to relate validity evidence to the interpretation and the meaning of test scores. Attachment measures that have strong construct validity evidence allow the school psychologist or counsellor to derive meaning from the scores that is relevant to the initial purpose of using the instrument. Thus, low scores on a measure of parent-adolescent attachment should not be the result of an invalid assessment because inaccurate identification, referral, and remediation could result. Rather, an attachment questionnaire that contains a representative sample of items and items relevant in content to the construct provides the professional with a quantitative indicator of the strength of the bond, as well as qualitative information about some of the characteristics of the parent-adolescent relationship. This will aid the school psychologist or counsellor in selecting the appropriate treatment and/or referral for each student.
Chapter Two

Literature Review

The purpose of the current chapter is to provide an overview of the research that has examined the construct of "attachment." Specifically, the reader will find a review of the history of the construct in studies of non-humans, and the theories and definition of attachment that resulted from these early observation studies. A compilation of the methods used to measure the construct of attachment in early childhood, adolescence, and adults will follow; combined with a discussion of the psychometric properties of these methods, with greater attention dedicated to those being used in the current study.

The History of Attachment

Current research on the construct of "attachment" is set upon a foundation of well-known studies and researchers who have examined the attachment behaviours among animals and human infants. In 1951, John Bowlby sought the research of Konrad Lorenz in an effort to better understand the function of relationships and the effects of maternal deprivation (Bowlby, 1988a). The following discussion on the history of the construct of attachment begins by referring back to the findings of the memorable studies by Lorenz.

Konrad Lorenz' research on the instincts that guide the formation of relationships between members of a species is detailed in the English translation by Kuenen, Lorenz, Tinbergen, Schiller, and Von Uexküll (1957). The majority of the research carried out by Lorenz, as discussed in the aforementioned book and by other authors (e.g., Berndt, 1992; Harris, 1986), is devoted to observing the process of "imprinting" among more than 25 different species of birds. In non-
primates “imprinting is a following response” (Harlow & Mears, 1979, p. 174) that occurs when the infant follows the first object that it sees after birth. This requires action by individuals in the external environment so that (a) the primary caregiver is the first object that the infant sees, and (b) the event occurs within the critical or sensitive period for that species. The critical period is defined in attachment literature as the limited time span in which a system is “sensitive to change in the environment” (Bowlby, 1982, p. 147). This period differs across species and for each system within the species that is sensitive to environmental influence. However, despite influences from the external environment, the responsibility of forming the bond between an infant and mother bird lies in the infants – they must waddle to the mother.

According to Lorenz (Kuenen et al., 1957), the imprinting process differs from typical early learning processes because it is only reversible during the critical period, and if the new parent is a more appropriate target than the existing one. So, once a gosling has imprinted on a human being, it will not follow other parent geese when they are presented outside the critical period. However, instincts prevail if the initial target was a human and a more appropriate target, such as a parent bird from the same species, is made available prior to the time when reversal is no longer a possibility. During the sensitive period then, priority is given first to a parent of the same species, secondly to a living object, and lastly to a lifeless object because it does not interact with the animal. Thus, instinctual behaviour cannot be changed, although it is somewhat plastic to enable the organism, and ultimately the species, to survive in different environments (e.g., Lorenz’ lab setting). For John Bowlby, Lorenz’ research
provided support for imprinting behaviour as inborn since it was observed across many species of birds.

Harlow and Mears provided additional research to the growing construct and theories of attachment through their studies of infant-mother attachment (or imprinting as discussed above) in non-human primates. Unlike the birds used in Lorenz' research, Harlow and Mears (1979) initially observed that primates are much more dependent on the mother to maintain the bond because they do not have the basic following response present in birds. As infants, most monkeys possess the strength to cling to the mother regardless of her activities. However, when an infant wanders, the primate mother needs to take a more active role in keeping the infant close to her to ensure its safety. In absence of the "following" response, infant monkeys, and human babies as will be discussed later, will rush to the primary caregiver in the face of fear or cry if they are not able to reach the caregiver. This is not just for physical safety, but serves as a way for the infant to learn to deal with fearful situations in the comfort of a parent's arms.

Additional research by Harlow and Mears framed attachment behaviour in a softer view. Their classic studies in the 1950's observed the behaviour of infant monkeys in the presence of wire and terry-cloth-covered mothers. Several experiments showed that the monkeys preferred the soft cloth-covered mother to the wire mother across several situations (Harlow & Mears, 1979). The authors noted that for one of the experiments, conducted over 165 days, eight infant monkeys had spent most of their time (since they were one-day-old) on the terry-covered mother regardless of which mother was lactating. The four infant monkeys who only had the wire mother nurse them spent just enough time with
the wire mother to gain enough nourishment during the day. The average time spent with the wire and terry-cloth-covered mothers over the course of 25 days varied from zero to less than three hours a day, and from six to greater than 18 hours per day, respectively. Harlow and Mears also conducted experiments that demonstrated that the cloth mother was preferred over the wire mother when the infants were scared. The infant monkeys clung to the cloth-mother while visually exploring new environments and would bring toys and other things found in the environment to her. These early observations suggest that attachment behaviour is not for the restricted purpose of feeding. Rather, the bond between a mother and infant appears to meet an emotional need of felt-security and emotional well-being among non-human primates.

Theories of Attachment

Several theories have been advanced from the disciplines of psychoanalysis, learning theory, and ethology to explain the purpose of parent-child attachment or bonding. The majority of these theories are from the psychoanalytic and learning perspectives (Bowlby, 1982) which view attachment behaviour as a means of physiological survival. For example, Freud maintained that the function of attachment was to meet the physiological need of food and warmth for an infant (termed “Secondary Drive Theory” by Bowlby, 1982, p. 178). Other theories suggest that an infant bonds to the mother for the purposes of trying to return to the womb, or to satisfy his/her need to engage in sucking or clinging reflexes (Bowlby).

However, early studies with non-humans, some of which have been discussed in the previous section, do not support such explanations. For
example, Harlow's monkeys spent more time with the cloth-covered mother regardless of whether it provided food. Therefore, the attachment must have been serving another purpose other than ensuring nourishment or satisfying the sucking reflexes for the newborn monkeys. Secondly, experiments with other animals such as puppies and lambs have shown that infants continue to seek the attachment figures (which were abusive humans and a television set in these studies) despite being raised in environments of abuse and neglect (Scott, 1962; & Cairns, 1966 as cited in Bowlby, 1982). Thus, infant animals will persist in seeking proximity to the attachment figure even though their needs of food, warmth, and satisfying sucking reflexes are not being met.

What purpose then does the bond between an infant and caregiver serve? According to John Bowlby (1982; 1988a), attachment behaviour is not designed to satisfy a need. Rather, the attachment system is a complex behavioural system that is designed for the protection of the individual, and ultimately for the survival of the species. This is also the rationale for other behavioural systems such as eating and sexual behaviours. Because reproduction is necessary for a species' survival, the behavioural systems and corresponding activating stimuli that are responsible for reproduction and care of the offspring are fairly stable or consistent across members of the species (Ainsworth et al., 1978). To increase a species' success, the attachment system is activated by those stimuli in the environment that are associated with or have the potential to threaten the survival of the child. Such external stimuli include absence or departure of the primary caregiver, lack of responsiveness by the mother, alarming situations, and the presence of strangers (after six months of
age). Internal precursors that increase the likelihood that the attachment system will be activated include infant pain, fatigue, hunger, illness, and temperature (Ainsworth et al., 1978; Berndt, 1992). It has also been suggested that over time attachment behaviours have evolved through a process of natural selection, whereby infants who engage in proximity seeking behaviour are more likely to survive because they are being protected by others (Ainsworth, 1989).

Definition of Attachment

Now that the purpose of the attachment behavioural system has been established, a definition of attachment behaviour is necessary to provide the framework for understanding the stages and sub-types of this system for human children and its measurement. The behaviours of a child (e.g., crying, smiling, and following) that cause the caregiver to approach are termed “attachment” behaviours because the natural consequence is closeness between a parent and a child. They typically occur in their greatest intensity when the child is in a frightened or stressful state and are present throughout the life-span. To provide a clearer picture of this construct, Ainsworth (1989) distinguishes between attachment and what she defines as an “affectional bond” (p. 711). According to Ainsworth, an affectional bond is a “long enduring tie in which the partner is important as a unique individual and is interchangeable with one other” (p. 711). On the other hand, attachment to a caregiver additionally incorporates the idea that the child views the other as stronger or wiser and this promotes the necessary aspect of the attachment bond – felt security.

It is also important to make the distinction between attachment and dependence. Although an infant is dependent upon a caregiver(s) to ensure
survival, the child does not actually form an attachment or bond with the parent until approximately six months of age (as will be discussed below). Dependency is viewed in our society as a negative characteristic of which weaker individuals may possess in their relationships. However, being attached in relationships is very positive and desirable — something that ideally continues throughout life (Bowlby, 1988a).

The Development of the Attachment System

The attachment behavioural system, as Bowlby defines it (1982 & 1988a), contains behaviours that are *innate* and behaviours that are *learned*. The behaviours that are innate to a species aid in the survival of the often-helpless infants immediately after birth. Human infants, for example, have five key behaviour patterns that appear automatically and contribute to the early attachment of a parent to a child. These behaviours include: rooting and sucking reflexes, crying, smiling, following by changing posture and the direction of gaze, and calling (Bowlby, 1982). This early stage is termed the "initial preattachment phase" by Ainsworth et al. (1978, p. 23) or the "orientation and signals with limited discrimination of figure" (Bowlby, 1982, p. 266). Consistent with literature on child development, the newborn infant responds similarly to the parents and other individuals because he/she has not yet developed acute visual discrimination skills. Only objects which are eight to nine inches away can be clearly focused on; which is coincidentally the length of the infant’s reach and distance from the face of a baby to its mother during feeding (Bowlby, 1982; Harris, 1986). However, in the early weeks, the child is able to respond to people differently based on olfactory and auditory stimuli. For example, within days of
being born a baby will respond to sounds by changing gaze and posture, and will discriminate between the mother's milk and other milk (Berndt, 1992).

The second stage of attachment development takes place between the ages of eight weeks and six months. In this phase the child's "orientation and signals [are] directed towards one (or more) discriminated figure(s)" (Bowlby, 1982, p. 266). Ainsworth et al. has also called this the "phase of attachment in-the-making" (1978, p. 24) because it is at this stage where the infant begins to show preference for one caregiver. This develops over a period of time when the child is developing the ability to discriminate familiar voices from a stranger's voice, and spends much more time looking at the eyes in a face - which a parent may feel is bonding and communication.

After six months of age a child is physically more capable of maintaining a bond with parents. The toddler often takes the initiative to seek proximity to the caregiver by crawling, and not before long by walking or running. Prior to this age, the stimuli that activated the attachment system were general, but with experience and maturity the stimuli necessary to elicit the same response need to be more specific as the child develops more advanced discrimination skills. This is especially apparent with the onset of a fear of strangers (occurring between seven and eight months of age, Berndt, 1992). With increased cognitive and discrimination skills, the child recognizes who is familiar using both auditory (voice) and visual (facial) stimuli. In addition, the toddler begins to associate familiar caregivers with approach behaviours and withdraws from strangers based on their recognition skills.
It is suggested by Harris (1986) and Berndt (1992) that children are most at risk for developing separation anxiety at this stage because they have not yet developed object permanence (not present until about 10 months of age). Consistent with Bowlby's ethological framework, this anxiety is a natural consequence of perceiving the threat of losing a parent, which has the potential to threaten a young child or non-human primate's survival (Bowlby, 1988a). However, separation anxiety can be easily reduced for a young child by providing encouraging multiple attachments, being responsive to needs and crying, having physical contact (eye-contact, holding, rocking, cuddling), and beginning a routine of prompts to gradually let the child know you will be leaving (Harris, 1986).

The fourth and final stage of attachment development occurs after four years-of-age and continues throughout adulthood. This stage is defined as the phase of "a goal-corrected partnership" by Bowlby (1982, p. 267) because the child's behaviour becomes planned as he/she develops an understanding of his/her caregiver's patterns of behaviour and feelings. Although the early attachment behaviours start out as reflexes, with maturity the behaviours become more controlled. Under the propositions of control systems theory, behaviours are viewed as purposeful or "goal-corrected" (Bowlby). The child forms mental representations of the attachment figure based on experiences with the parent in various situations. These experiences help guide and influence the attachment behavioural system in how the child will react in the future to personal stress and how he/she will obtain attention and care from the parent.
For example, if the child is feeling lonely, and he/she has learned from previous experience that the caregiver will only respond quickly when intense emotions are shown, then this is likely the behaviour that will be produced. If however, the parent is more responsive and attentive, the child’s behaviour may not be as intense. In response to infant attachment behaviour(s), the attachment figure (typically the mother or father) engages in caregiving behaviour, or “maternal behaviour” (Ainsworth et al., 1978, p. 6). These parent behaviours (e.g., feeding, rocking, personal contact, and interacting with the child visually and verbally) are the feedback mechanisms to the child and affects the intensity of the child’s response to the parent and the behavioural latency.

Although attachments continue throughout the life-span, they are different for the adolescent and adult. To begin with, the bonds formed by adolescents and adults are typically not limited to that shared with a parent. During times of crisis or stress an adolescent may seek the security of a peer, religious group, or another adult which he/she will perceive as being able to provide as much or more security than what is provided by the parent(s). The individual then forms different mental representations of behaviours and expected feelings with different attachment figures (Sperling et al., 1992). Thus, the attachments formed with individuals in one category, such as friends, will be qualitatively different with those from other categories.

Secondly, poor attachments in childhood affect current relationships and the development of new bonds throughout the life-span. As discussed earlier, the bond between a child and parent forms the basis of the cognitive representation that a child has of a caregiver. This includes how the child feels towards the
caregiver, as well as how the child is made to feel about him/herself as a result of parenting behaviours towards the child. Poor bonds can transfer to feelings of low self-worth, depression, and a lack of security that can threaten the physical and/or emotional well-being of the child in his/her present state as well as during adolescence and adulthood.

Measuring Attachment in Early Childhood

The most well known measure of parent-child attachment is the Ainsworth Strange Situation developed by Mary Ainsworth and colleagues (Ainsworth et al., 1978). The strange situation is designed to examine the internal attachment model that a child has with his/her mother by observing and recording attachment behaviours in their greatest intensity. The entire session requires a mother-infant pair to remain for eight, three-minute episodes in a comfortable playroom (located in a laboratory) full of age-appropriate toys that the child can play with. An outline of the eight episodes is as follows: (a) the experimenter introduces the child and mother to the playroom; (b) the mother places the infant on the floor; (c) a stranger enters the room and interacts with the mother, then the infant; (d) the mother leaves the room; (e) the mother re-enters the room, reassures the infant, and the stranger exits; (f) the mother leaves the child alone in the room after saying “bye-bye”; (g) the stranger returns and calms the infant; and (h) the mother returns to the room and the stranger leaves (Ainsworth et al., 1978).

Based on Bowlby’s attachment theory, and the observations recorded in the early design of the strange situation, Ainsworth was able to develop a classification system that delineates the type of bond that a child has with a
parent. The initial categories include securely attached infants (Group B), anxious and ambivalent infants (Group C), and avoidant infants (Group A). Securely attached infants are typically associated with parents that are sensitive and responsive. These infants were observed during the strange situation to have positive interactions with the mother, respond to and be comforted by close contact, engage in a large amount of exploratory play, and less likely to cry when the mother left the room. The infants categorized as Group C were observed to engage in very intense attachment behaviours, bodily contact had to be on their terms, they did not engage in exploratory play, and were occasionally withdrawn. Finally, the Group A-classified infants were observed to either avoid the mother during reunion, or not be comforted by caregiving behaviours such as holding. According to Crittenden, Partridge, and Claussen (1991), children who are viewed as having an insecure attachment with a parent learn such behaviours as a way of coping with a parent who is either inconsistent, as in the case of ambivalent attachments, or intrusive, as in avoidant relationships.

A disorganized category has also been operationalized by Mary Main and Judith Solomon (1990) in response to observing several infants that could not be easily categorized as having A, B, or C types of attachment. In response to “contradictory emotional signals” (Lyons-Ruth, Repacholi, McLeod, & Silva, 1991, p. 393) from a parent(s), the infant appears disorganized, disoriented, and exhibits inconsistent and contradictory movements, expressions, and behaviours (Main & Solomon). These behaviours have also been observed in infants prenatally exposed to drugs or alcohol. For example, Rodning, Beckwith, and Howard (1991) examined the relationship between infant-mother attachment and
prenatal exposure to phencyclidine (PCP). PCP is categorized as a psychedelic drug with analgesic and amnesic properties (Julien, 1992). Before its use as an illicit street-drug, it was initially developed as an anesthetic in humans in the 1950's, but is now used in veterinary medicine. In their study of infant and mother dyads, Rodning et al. witnessed very disturbing behaviours in the infants classified as disorganized:

[D]azed and trance-like expressions; aimless wandering about the room; crying for the absent parent, followed by turning away from the parent on reunion; stereotypies and anomalous postures; confusing the caregiver and stranger; and aggression toward the parent while smiling. (p. 363)

Since its publication in 1978, a large body of research has been carried out using the strange situation as the measure of infant-parent attachment. However, some studies have modified the method described above. For example, some of the episodes have been extended in length and the experimenters allowed the mother to return to the room with toys (DeMulder & Radke-Yarrow, 1991); or the execution of the first step was not specifically noted in the procedure (Carlson, Cicchetti, Barnett, & Braunwald, 1989). Although these deviations from the routine appear minor, they nevertheless should be regarded as changes in the actual measure, and results from such studies viewed in this light.

The Ainsworth Strange Situation does not have an alternate form, nor does the method of measurement derive a raw score. Therefore, necessary estimates of reliability should include test-retest and judgements between raters. These estimates have been provided in numerous studies, with a select few
discussed as follows. Few studies have examined the test-retest stability of the strange situation categories. However, Lyons-Ruth et al. (1991) did test their sample of infant-mother pairs at 12 and 18 months of age. Using the percentage of agreement as the index of stability over time, 60% of the infants (n = 46) were classified as the same attachment type over time using only the three-category system (A, B, C). However, when the infants were measured using the four-category system (including Main and Solomon's disorganized classification), only 30.4% of them remained in the same category over the six-month period.

Considering Bowlby's position mentioned earlier, that attachment with an individual is stable over time, one should expect greater stability in the measurement of attachment types than that shown by Lyons-Ruth et al.

Estimates of the stability of the classifications between raters (reliability of judgements) can be obtained for the strange situation by looking at the percentage of agreement between the raters, or by using the more robust Cohen's Kappa coefficient. However, because none of the following studies specified using Cohen's Kappa, the current author assumes that the researchers used percentage of agreement as the reliability index. The Ainsworth Strange Situation A, B, C coding procedure has yielded stability of judgements estimates between 0.86 and 0.96 with children less than 30 months of age (Lyons-Ruth et al., 1991; Crittenden et al., 1991, & Radke-Yarrow, McCann, DeMulder, Belmont, Martinez, & Richardson, 1995). In studies that have used the four-category procedure to categorize infant-parent attachment, high estimates of consistency are also evident between judgements by raters. These estimates range from 0.80 to 1.00 (Carlson et al., 1989; DeMulder & Radke-Yarrow, 1991; O'Connor,
Sigman, Kasari, 1992; Rodning et al., 1991; & Shaw, Owens, Vondra, Keenan, & Winslow, 1996). Thus, the literature supports the strange situation as a measure that will yield consistent classifications across different raters.

In terms of the validity of the strange situation categorization of infant attachment, several studies have found relationships between type of attachment and prenatal drug exposure, maltreatment, and maternal depression. In their study of 12 month old infants (n = 44) who were prenatally exposed to alcohol, O'Connor et al. (1992) concluded that the categorization of insecure infant attachments was predicted from a path beginning with prenatal exposure to alcohol, followed by negative infant affect, and then negative mother-child interaction. Rodning et al. (1991) found similar results in their study of 15-month-old children who were prenatally exposed to phencyclidine (PCP). Using the four classification types, they found that up to 75% of the infants exposed to PCP were classified as disorganized, compared to only 12% of the comparison group.

Similarly, studies have shown that a greater proportion of children who have been maltreated are insecurely attached or disorganized in their relationships with their mothers. For example, Carlson et al. (1989) studied the attachment patterns of 43 mothers and their 12-month-old infants, with 22 of the infants having a history of abuse. When comparing the maltreated and non-maltreated infants, the researchers found that there were statistically significant differences in attachment classification. Specifically, the maltreated infants were less likely to be securely attached, and 82% of the abused children did not have an attachment pattern with their mothers (82% were classified as disorganized, compared to 19% among comparison children). Cicchetti and Barnett (1991) also
found that in their sample of 125 children (ages 30, 36, and 48 months), the 65 children that had a history of being abused by their mothers and possibly more caregivers, were statistically significantly more likely to be insecurely attached to their mothers.

A high percentage of insecure attachments have also been found in children who have mothers diagnosed with a form of depression. From a sample of 112 mother and infant pairs, DeMulder and Radke-Yarrow (1991) found a statistically significant greater number of mothers with children classified as insecure, versus secure, who expressed higher levels of negative affect such as anger or sadness. Statistically significant results were also found when the number of children classified as insecurely attached were compared across the maternal bipolar depression (n = 43), maternal unipolar depression (n = 24), and the control (n = 45) groups. The children identified as insecurely attached comprised 67%, 42%, and 42% of each group, respectively. Moreover, the majority of the children with mothers diagnosed with bipolar depression were of the disorganized attachment type.

In summary, high-risk conditions such as prenatal exposure to drugs and alcohol, maltreatment, and maternal illness appear to be related to a child's attachment style. Whether these conditions and attachment patterns necessarily pre-determine a child's well-being is complex in the absence of longitudinal research and given the multiple factors affecting a child's development. At the same time, control systems theory would suggest that combining a negative type of relationship that a child has with his/her parent and high-risk conditions may make a child more vulnerable to negative life events, poor emotional health, and
affect future relationships. This is most notably evident in infants diagnosed with "failure to thrive syndrome" or FTTS (Berndt, 1992; Harris, 1986). In these cases, parent neglect and poor or inappropriate response to an infant’s needs is manifested into a physical condition for the infant, whereby the infant’s growth is below the third percentile, he/she has feeding and sleeping difficulties, and the child is no longer comforted when held. Of importance then, is research carried out throughout the life-span to examine the long-term effects of poor parent-infant attachment and whether early secure attachment patterns appear to be related to more positive emotional and physical well-being later in life.

Attachment in Adolescence and Adulthood

Up until the 1980’s, the majority of research on attachment focused on measuring relationships developed in infancy and early childhood. Now, with the development of measures designed to assess parent-child attachment during adolescence and early adulthood, the construct of “attachment” and related theories as it pertains across the life-span can be empirically examined. For example, these measurement tools have provided insight into the relationship between parent-adolescent attachment patterns and other aspects of an adolescent’s life such as emotional well-being (e.g., De Jong, 1992; Greenberg, Siegel, & Leitch, 1983; Kenny, Moilanen, Lomax, & Brabeck, 1993; Papini & Roggman, 1992; Sack, Sperling, Fagen, & Foelsch, 1996), peer relations (e.g., Armsden & Greenberg, 1987; Cotterell, 1992; Schneider & Younger, 1996), and the occurrence of antisocial behaviour problems (e.g., Marcus & Betzer, 1996; see also Greenberg, Speltz, Deklyen, & Endriga, 1991; Shaw, Owens, Vondra, Keenan, & Winslow, 1996). Reliable and valid adolescent and adult attachment
measures can also be used in longitudinal research to help determine whether early attachment patterns, as measured by the Ainsworth Strange Situation, are stable across time as proposed by Bowlby (1982, 1988b).

Recall that the attachment system is a behavioural system (Bowlby, 1988a) that is highly active when the child seeks proximity to the caregiver during times of fear, crisis or stress. Coupled with the knowledge that during early childhood, children describe how they feel about others in terms of physical properties, the Ainsworth Strange Situation appears to have excellent content validity because the attachment classifications are based on observed behaviours. However, one aspect of the developing attachment system that is not measured by the strange situation is the cognitive or mental representations that the child develops of each attachment figure. The movement of research into the study of parent-child attachment in adolescents and adults, and the development of age-appropriate measures, has bridged this gap to studying the feelings and cognitions associated with attachment behaviour.

**Attachment Measures for Adolescents and Adults.**

To date, six measures of parental attachment for use with adolescents and/or adult samples have been developed. In the paragraphs that follow, each measure is described and evidence regarding its psychometric quality reviewed, providing the basis for selecting measures to be evaluated in the current study.

**The Parental Bonding Instrument.** The Parental Bonding Instrument (PBI) by Parker et al. (1979) is a 25-item instrument that asks adults to rate parental behaviours of care or overprotection, on a four-point Likert scale. The participants are requested to respond for each parent according to their
memories during their first 16 years of life, making it inappropriate for use with adolescents less than 16 years of age. Nevertheless, it does appear in the literature as a measure of parental caregiving. Two subscales, Care and Overprotection, are comprised of 12 and 13 items, respectively, which can be administered separately or together as the PBI. When the 25 items are administered, responses are scored to match one of five bonding types based upon low, average, or high scores on each of the Care and Overprotection subscales.

The development of the PBI originated from 114 items, derived from Bowlby's theory and literature (Garbarino, 1998), that were administered to two small samples in pilot studies. Forty-eight items were then left for reliability and validity analyses on a sample of 150 adults (Parker et al., 1979). A concurrent validation analysis with responses from the Thematic Apperception Test was not able to discriminate among the PBI items. Rather, exploratory factor analysis reduced the items to the current 25-item PBI. Internal consistency coefficients of the scores from the Care and Overprotection subscales were .88 and .74, respectively. Using a very small sample, stability of the test over three weeks yielded a \( r(15) = .76 \) and .63 for the Care and Overprotection subscales. These moderate coefficients are not as high as one would expect given the theoretical view of parental bonding type or style as a fairly stable construct.

Parker et al. (1979; also discussed in Lopez & Gover, 1993) also examined the validity of the scores produced from the PBI among nonclinical participants. In their interviews with 65 nonclinical participants, moderate correlations (.48 to .77) between scores were obtained on the two subscales of
the PBI and from interview ratings. The interviews were conducted with two of the PBI authors requesting participants to discuss the emotional satisfaction and independence provided by their parents. Responses were then given a score of one to five for each of care and overprotection. Importantly though, the raters were not blind to the purpose of the interviews and were providing scores on a construct for which they had also developed a self-report instrument they were trying to validate. Thus, the relatively large indicators of concurrent validity may be the result of experimenter expectations or bias.

Hazen-Shaver Attachment Self-Report. In 1987, Hazan and Shaver developed the Hazan-Shaver Attachment Self-Report (HS) as a method of measuring the attachment style an adult has with a romantic partner. Participants are required to read three short paragraphs and then choose the one that best describes the feelings associated with that relationship (Garbarino, 1998; Lyddon, Bradford, & Nelson, 1993). Each paragraph is designed to represent one of the three main attachment types discussed by Mary Ainsworth (1978) namely, secure, insecure-avoidant, and insecure-ambivalent. In lieu of limited reported reliability information, Lyddon et al. reported a stability index. Over a one-week period responses from the HS yielded a contingency coefficient\(^iv\) of 0.60.

With regard to the validity of the instrument, Sperling, Foelsch, and Grace (1996) compared the mean scores of participants classified by the HS across four measures designed to explore adult attachment to a romantic partner. Participants classified as secure (n = 97) by the HS received statistically significantly higher scores on subscales that assessed dependency and security, than those classified as avoidant (n = 53) or ambivalent (n = 9). However, with
the exception of one out of the 12 subscales, the participants classified as avoidant or ambivalent did not have statistically different scores on the subscales. Thus, without more convincing reliability and validity evidence, the research to date suggest that this measure may only be able to distinguish more simply between secure and insecure attachment styles, rather than between the three types used by Ainsworth.

Continued Attachment Scale. The Continued Attachment Scale (CAS; Berman et al., 1988) is a self-report scale designed to assess the attachment between older adolescents or adults and their parents. On this six-item measure, a participant rates, on a five-point scale, the frequency or quantity of behaviours and feelings that he/she has about his/her mother and father based on the past two weeks to arrive at a total attachment score. A study by Berman et al. (1994) found that the internal consistency of the scores from 216 college students was $r_\alpha = .74$ to $.80$ for the mother and father versions, respectively. However, evidence for the validity of the measure was not as supportive. The majority of the Pearson correlation coefficients between the scores from the CAS and other attachment scales (Inventory of Parent and Peer Attachment, Armsden & Greenberg, 1987; Attachment Style Inventory, Sperling, Berman, & Fagan, 1992; Adult Attachment Scale, West, Sheldon, & Reiffer, 1987; Parental Attachment Questionnaire, Kenny, 1987; and the Parental Bonding Instrument, Parker et al., 1979) were below $.20$, with only $38\%$ of the coefficients between $.20$ to $.40$. These correlation coefficients were similar to those obtained in the same study that also gathered evidence for the discriminant validity of the CAS using several measures of anxiety and depression.
Attachment Style Inventory. The Attachment Style Inventory (ASI) was developed by Sperling, Berman, and Fagen (1992) to extend the research of Hazen and Shaver. Contrary to the conceptualization of attachment as insecure or secure by Ainsworth et al. (1978), object relations theory proposes that secure and insecure attachments exist within different attachment styles (Sperling & Berman, 1991). As a result, the ASI requests the individual to first select the type of insecure attachment he/she has, and secondly to rate the security of that style within the relationship. Using a nine-point Likert scale, participants complete four forms (mother, father, friends, sexual relations) each containing four paragraphs that describe a different attachment style (avoidant, dependent, hostile, and resistant/ambivalent). For the second part, which addresses the security of that style within a given relationship, two paragraphs that describe opposite ends of the spectrum on security of attachment are read and the participant rates, from one to nine, which best describes the particular relationship.

Each of the four paragraphs is treated as a subscale for each form, thereby relying on the ratings of one item when used in correlation and factor analyses. Alternatively, ratings for each style are totaled across all forms to produce four global attachment scores (avoidant, dependent, hostile, and resistant). The use of the scores in this manner though contradicts the discussion by one of the authors (Sperling et al., 1992, p. 244) whereby “individuals who are psychologically healthy” will likely have different attachment styles across categories of attachment figures. However, very low estimates of internal consistency of $r_\alpha = .39$ up to $.53$ ($N = 160$) among the security dimension and four styles (Sperling et al., 1996) suggest that there appear to be different styles.
across relationships, and that total scores across forms may lead to inaccurate interpretations. Further, a pattern of positive and negative Pearson coefficients among the four global attachment and security scores suggested that the dependent global scale may not be an insecure attachment type. Based on participant responses, the dependent global score had a moderate positive correlation with the security dimension score, while the remaining ‘insecure’ styles were negatively correlated to the dependent style and security scores.

Consistent with attachment theory, one would expect that individuals with a history of psychiatric problems would likely have a history of unstable relationships, thereby affecting their future interactions and attachment to caregivers, friends, and intimate partners. A select number of studies have bridged theory with outcomes on the ASI to offer some support for the validity of this measure. In a 1991 study by Sperling, Sharp, and Fishler, statistically significant differences were observed between “normal college students” (n=128, p. 544) and the psychiatric patients (n=24) in the endorsement of the dependent and resistant styles of attachment in friendships and intimate relationships. The majority of college students endorsed a dependent style, while the psychiatric patients selected dependent and resistant equally to characterize their relationships. Sack et al. (1996) also found that psychiatric patients yielded statistically significantly lower scores on the dependent attachment type and had higher rates of endorsing the avoidant and hostile-dependent types. Although no security ratings were obtained in the two studies, it appears that the ASI has the potential to differentiate between the normal population and psychiatric patients. However, a note of caution is given because the authors of the two studies failed
to test the demographic equality of the samples, suggesting that such differences may not be meaningful and due to possible differences in the characteristics of the samples. Although limited, evidence for convergent validity of the scales has been shown by Sperling et al. (1991) and Sperling et al. (1996) with the Millon Clinical Multiaxial Inventory II and the Hazen-Shaver Attachment Self-Report, respectively.

The measures just reviewed have not been chosen for the current study for several reasons to be summarized here. To begin with, the PBI is a retrospective measure that is more suitable for adult samples. Secondly, the HS and ASI were developed to measure the nature of romantic relationships, which is clearly inappropriate for young adolescents because they have limited experience and using such measures is not likely to elicit parent consent for participation in the study. The development and research on the HS and ASI are also inconsistent and fail to show strong support for the scales initially developed. Rather, the secure and insecure dichotomy of the items appears to be more congruent according to validity results. Finally, because the CAS is a very short measure of parent-child attachment, it may have provided a good comparison to the longer measures chosen below. However, the current author was unable to obtain consent from the developers of the CAS to use the measure in the current study.

Parent-child Attachment Measures for the Current Study

To follow is a description of the two measures under primary investigation in the current study. The Parental Attachment Questionnaire (PAQ) by Kenny (1990) and the Inventory of Parent and Peer Attachment (IPPA) by Armsden and
Greenberg (1987) were developed to assess the quality of attachment that adolescents have with their parents and peers. Both of these measures have been used in numerous studies that have examined attachment among adolescents. However, they have never been used in the same study, thus evidence that the two instruments are measuring the same construct of "attachment" is of primary concern.

The Parental Attachment Questionnaire. The PAQ was developed by M. E. Kenny in 1987 to assess the current strength of attachment between a parent and child through the perceptions of the adolescent or young adult. The PAQ includes 70 items pertaining to parental behaviours and perceived feelings, the relationship between the adolescent and parent(s), and the feelings and experiences of the adolescent in the relationship. The response format of the PAQ is a five-point Likert scale (1 = Not at all; 2 = Somewhat; 3 = A moderate amount; 4 = Quite a bit; and 5 = Very Much). Responses on the PAQ yield three subscales: Affective Quality of Attachment, Parental Fostering of Autonomy (also known as Fostering of Autonomy subscale), and Parental Role in Providing Emotional Support (also discussed as the Providing Emotional Support subscale), derived from results of a principle component analysis from a sample of 173 college students. The Affective Quality of Attachment subscale is comprised of items most of which query the participant on his/her feelings of love and support by the parent, perceptions of being understood by the parent, and wanting to be with the caregiver. The second subscale, Fostering of Autonomy, asks for responses on items about the parent(s) respecting the individual's privacy, ideas, and decisions. The Providing Emotional Support subscale
addresses the willingness of the adolescent to ask for help and his/her feelings of perceived protection by the parent. This being said, it is important to remember that the items were not grouped together from a conceptual framework, but according to a PCA, and as a result, several of them appear to fit into another subscale.

Since its initial development in 1987, studies using the PAQ or examining its psychometric properties have used a shorter, 55-item version of the PAQ (Kenny, 1990) containing the same three subscales. Two alternate forms are available for this measure. One requires the participant to provide a single rating for both parents, the other permits separate ratings of mother versus father attachment. Results of a single pilot study (discussed in Kenny, 1987) revealed that the scores (subscale or total not specified in article) on the mother and father forms in a sample of college students were not statistically different. As a result, scores from the mother and father forms have been combined in research by providing the single rating form, to yield single scores for each of the total scale and subscales (Kenny et al., 1993). Although alternate form reliability coefficients comparing the equality of the alternate forms in different samples have not been published, the dominant practice has been to use the single rating measure in research (Hart & Kenny, 1997; Kenny, 1987; Kenny, 1994; Kenny & Donaldson, 1991; Kenny & Donaldson, 1992; & Kenny & Perez, 1996). Without alternate form reliability estimates and theoretical reasoning, this methodology is difficult to justify. Attachment theory would suggest that the separate ratings would be more accurate because an adolescent or young adult will have qualitatively different relationships between attachment figures such as friends, intimate partners, and
parents (Sperling et al., 1992). Thus, it should be of critical importance to test out this theory to provide empirical research that the mental representations between individual parents are not statistically different at a single time period or over time (Bowlby, 1982) prior to adopting a single rating based on one pilot study.

In addition to alternate form reliability, estimates of internal consistency and the stability (test-retest reliability) of the PAQ over time are required to assess the efficacy of the instrument. Internal consistency estimates have been provided for the total measure, and for each of the three subscales of the PAQ in three studies (Kenny, 1987; Kenny et al., 1993; Kenny & Perez, 1996). Analysis from the initial study in 1987, involving 173 college students (100 women and 73 men; ages unknown), produced Cronbach’s alpha reliability coefficients for the total scores of $\alpha = .95$ and .93 for female and male respondents, respectively, for the 70-item PAQ. In a second study by Kenny et al. (1993), a group of 207 grade eight students in a public school (92 girls and 115 boys) were administered the 55-item version of the PAQ. The internal consistency estimates for scores produced from the three subscales were: $\alpha = .95$ for the Affective Quality of Attachment subscale, $\alpha = .88$ for the Fostering of Autonomy subscale, and $\alpha = .83$ for the Providing Emotional Support subscale. Finally, among a group of 172 ethnically diverse college students (91 women and 81 men; average age of 18.26 years), scores from the PAQ produced reliability estimates of $\alpha = .88$, .79, and .75 for the three subscales, respectively (Kenny & Perez, 1996). Although these reliability coefficients are high, they may be merely due to the large number of items in the scale with several similarly worded items (e.g., item 28 “I looked forward to seeing”; item 32 “I wanted to be with all of the time”; item 40 “whose
company I enjoyed"). To address the stability of the PAQ scores across time, Kenny (1990) reports a test-retest reliability coefficient of \( r(171) = .92 \) for the entire measure over a two-week period.

Empirical literature has provided information on two areas of validity for scores obtained from the PAQ. First, Kenny addressed the content validity of her developing measure by initially constructing 70 items that represented certain areas of parent-child relationships, and drawing on attachment theory from Ainsworth. In addition, research colleagues and graduate students reviewed the items to verify that the domain areas outlined by Kenny were adequately represented in the items.

Second, the construct validity of the PAQ has been evaluated through factor analyses and the strength of the relationships observed between scores on the PAQ and tests of family environment and emotional well-being. In the initial study that examined the developing PAQ (Kenny, 1987), Kenny conducted principle components factor analysis of item responses separately for male and female samples. The scores from the two samples varied on the mean score for seven out of the 67 items. Moreover, a four-factor solution was obtained for the female sample, and a three-factor solution was obtained for the male sample with only one labeled factor in common. Because the seven items (numbers 44 through 50) were retained in the final 55-item measure, studies that followed (Kenny, 1994; Kenny & Donaldson, 1991; Kenny et al., 1993) examined the possibility of statistically significant differences in the scale scores. In particular, the Providing Emotional Support subscale was focused upon, because six out of
the seven items loaded on this factor, to determine if separate analysis were necessary, and why possible sex differences existed.

The three studies referred to yielded mix results. Among a sample of relatively equal number of male and female eight-graders (N = 207) who were reportedly equal on the demographic characteristics, no sex differences in perceived parental attachment were reported. The remaining two studies failed to test for the demographic equality of the samples, but found some statistically different scores (Kenny, 1994; Kenny & Donaldson, 1991). The study by Kenny (1994) included a sample of 130 men and women (45% female) and reported a statistically significant difference on the Providing Emotional Support subscale, with women obtaining higher subscale scores. The second study (Kenny & Donaldson), comprised of 77% female participants, reported statistically significant differences across all three subscale scores, with women scoring higher than men. Despite the differences in the mean scores of the two groups (as reported in the two latter studies), it is not clear that the interrelationships among the latent constructs are invariant. That is, the PAQ may not be measuring the same aspects of parent-child attachment for both sexes. Although an evaluation of the constructs may be to conduct separate factor analyses for male and female samples, such analysis would not provide a comprehensive understanding of the factor structure. However, using structural equations modeling the authors from the three previous studies could have tested the equality of the factor structures (including the invariance of the loadings, standard errors of measurement, and the correlations between the factors), across the two
groups as evidence for the construct validity of the PAQ across sexes and the need for separate analyses in future research.

Correlation analyses comparing the 55-item version of PAQ scores with scores from other attachment measures would provide additional evidence for the validity of PAQ scores as indicators of parental attachment. However, studies have not included additional attachment questionnaires, but have looked at relationships with measures of other constructs, which theoretically should be related, offering a less convincing argument to the construct validity (discriminant validity) of scores obtained from the PAQ. Positive relationships have resulted between the PAQ scale scores and measures of family characteristics and individual self-perceptions of worth and emotional well-being (Kenny, 1990; Kenny, 1987; Kenny et al. 1993; Kenny 1994). Recall that attachment patterns with caregivers affect how the child will form and react in future relationships and cope with life stressors. In addition, the attachment that a child has with a caregiver(s) helps to form a child's self-perceptions. Thus, one would expect that measures of self-worth, social competence, anxiety, and depressive mood may be related to attachment scales, but not to the same extent as scores from another attachment measure, thereby providing evidence of discriminant validity.

A study using the Self-Perception Profile for Children Global Self-Worth scale (Harter, 1988) demonstrated correlations with PAQ subscale scores ranging from $r = .20$ to $.40$ ($N=207$, Kenny et al., 1993). Similar correlations were found in Hart and Kenny's study (1997) between PAQ subscale scores and measures of social competence, suggesting that the construct of parental attachment is related to the trust and security individuals feel in social relationships. In a sample of 156
female undergraduates, correlations between scores on the PAQ subscales and the Interpersonal Distrust and Social Insecurity scales of the Eating Disorder Inventory-2 (Garner, 1991) ranged from $r = -.30$ to $-.49$.

Researchers have also demonstrated low to moderate negative correlations between scores obtained on the PAQ and measures of anxiety, depression, and negative self-perception (Kenny & Perez, 1996; Kenny et al., 1993). From a sample of 172 college students, Kenny and Perez (1996) obtained low correlations ($r = -.22$ to $-.26$) from scores on two subscales of the PAQ (Affective Quality of Attachment subscale and Fostering of Autonomy subscale) and the Anxiety, Depression, and Interpersonal Sensitivity subscales of the Hopkins Symptom Checklist (Derogatis, Lipman, Rickles, Uhlenhuth, & Covi, 1974). The Interpersonal Sensitivity subscale is similar to a measure of self-worth, but is reverse keyed and includes items about an individual's ease in personal relationships. Negligible correlations were obtained in this with scores on the Providing Emotional Support subscale. According to the authors, the tangible support available to children when they live with their parents may change, in the perceptions of the child, once he/she has moved away to attend college. In other words, although the child still requires the emotional support of parents, he/she may view counsellors or peers as providing a more accessible physical presence or support. Among 207 eight-grade students, Kenny et al. (1993) obtained somewhat higher correlations between scores on the PAQ subscales and the Children's Depression Inventory (Kovacs, 1983) ranging from $r = -.39$ to $-.51$, suggesting a moderate relationships between the two constructs of attachment and depressive mood in young adolescents.
In summary, research examining the psychometric integrity of the PAQ included adequate sample sizes for correlational analyses and a representation of female and male participants of different ages (ranging from young adolescents to college students). Consistently high reliability estimates provide support for the consistency and stability of responses on the subscales of the Parental Attachment Questionnaire. However as mentioned earlier, a lengthy measure and several similarly worded items may contribute to inflated score reliability. Nonetheless, estimates of internal consistency of total scores obtained on the 55-item PAQ have yet to be published. Correlation coefficients relating scores derived from the three PAQ subscales and from measures of depression, anxiety, self-worth, and social competence provide some support for the construct validity. However, further research on the validity of the 55-item PAQ using factor analysis and tests of factor invariance is required to determine whether the scores and pattern of responses derived from male and female respondents are significantly different to warrant a different subscale/construct formats of the PAQ and possibly separate analyses.

The Inventory of Parent and Peer Attachment. The revised Inventory of Parent and Peer Attachment (IPPA) is the second measure that will be used in the current validity study of adolescent “attachment.” The original 53-item IPPA included a combined parent form which some studies used (Cotterell, 1992; Raja, McGee & Stanton, 1992). Since Armsden’s dissertation (1986), G. Armsden and M. T. Greenberg (personal communication, March 20, 1998) now suggest employing the separate parent forms to address possible differences in the strength of attachment to different caregivers. The revised
IPPA includes 25 items completed on separate forms for each parent (versus 28 items in the original IPPA), and 25 items to assess attachment to friends. Responses to each item are made on a 5-point Likert scale (1 = Almost Never or Never True; 2 = Not Very Often True; 3 = Sometimes True; 4 = Often True; and 5 = Almost Always or Always True). The 25 items for each form are divided into three subscales, Trust, Communication, and Alienation, derived from principle components analysis on a sample of 179 students, 16 through 20 years of age. On the parent forms, the Trust, Communication, and Alienation subscales are comprised of ten, nine, and six items, respectively. While the Trust, Communication, and Alienation subscales on the Peer form contain ten, eight, and seven items, respectively.

The required reliability estimates for the IPPA are coefficients of test-retest stability and internal consistency. Unfortunately, the only published stability coefficient was based upon the initial IPPA (which contained 28 combined parent items and 25 peer items). In a sample of 27, 18- to 21-year-olds, coefficients of \( r(25) = .93 \) and \( .86 \), for the Parent and Peer forms, respectively, were obtained over a three week period, providing an early indication of the high stability of responses on the items. Papini and Roggman carried out an exciting study in 1992 that tested 47 adolescents on the revised parent forms of the IPPA on three occasions over a one-year period. This data provided an excellent opportunity to calculate test-retest reliability of the parent forms. However, such estimates were not made available.

To address the internal consistency of scores produced by the IPPA, separate estimates for the different forms and subscales are required. The
internal consistency of scores from the two parent forms have shown to be very
good in several studies ranging from $r_s = .88 \ (N = 47)$ to $.94 \ (N = 493)$ for the
Mother form and $r_s = .86 \ (N = 47)$ to $.94 \ (N = 493)$ for the Father form (Papini &
Roggman, 1992; Papini et al., 1991; Paterson, Field, & Pryor, 1994; Paterson et
al., 1995). However, studies that have used the Peer attachment form (Paterson
et al., 1994; Paterson et al., 1995) have yielded a very low estimate of $r_s = .48$ (in
a sample of 493 adolescents 13 through 19 years of age), suggesting that these
25 items are not as homogeneous as those appearing on the parent form. The
internal consistency of scores produced from the three subscales on each form
has not been provided for the revised IPPA. Only estimates from the initial 28
item combined Parent form and 25-item Peer forms primarily in the range of mid
.80's to low .90's have been indicated (Armsden & Greenberg, 1987; Cotterell,
1992). Therefore, research that provides internal consistency estimates on the
revised IPPA total scores as well as subscale scores are required.

The history of the development of the revised IPPA suggests that the
content of the measure is theory-based with good content validity. The initial
IPPA was developed by Armsden and Greenberg (1987) as an extension of an
earlier attachment measure, the Inventory of Adolescent Attachment (IAA;
Greenberg et al., 1983). The IAA was developed from a 50-item pool based on
the attachment theory of Bowlby and the collaborative efforts of 17 experts
(including graduate students in clinical psychology, nursing, and therapists who
worked with adolescents) to assess the content validity and readability of the
measure. However, Armsden and Greenberg expanded the IAA to provide a
better representation of Bowlby's (1973) principal theoretical components: felt
security, responsiveness, and feelings of separation. To follow was a two-part study with 179 students who were first administered 60 initial items. Factor analysis confirmed the use of two scales, parent and peer scales. Scores on each scale were then factor analyzed separately, yielding three subscales based upon factor loadings and conceptual content of items. The result was an IPPA composed of 28-item Parent and 25-item Peer scales. A final revision was then made based on Armsden's research (1986) to suggest that separate parent forms were required. This change made the measure more congruent with attachment theory, and permitted testing the theory that suggests individuals may have different types of attachment with different attachment figures. The revision also included reducing the parent items from 28 to 25, and changing the wording of two peer measure items.

Only two studies have examined the intercorrelations of the subscales within and between the parent and peer versions of the IPPA. Moreover, research on the parent scales has been limited to the 28-item parent questionnaire. Armsden and Greenberg's initial study (1987) of the development and psychometric integrity of the 53-item IPPA examined the intercorrelations of the subscales within the combined Parent form and between the Parent and Peer scales. From their sample of 179 college students, high correlations were observed within the three subscales of the Parent form ranging from $r = .70$ to $.76$ (with negative correlations between scores on the Alienation subscale and the two positively keyed subscales). However, this same pattern was not observed by Schneider and Younger (1996) with a sample of 63, grade ten students when the parent scale was separated into Mother and Father forms. Instead,
correlations between the subscales, within each parent form, ranged from $r = .02$ to .53, with the largest correlations observed between the Trust and Communication subscales.

Within the Peer scale, a correlation of $r = .76$ ($N = 179$) was obtained by Armsden and Greenberg (1987) between scores on the Trust and Communication subscales, whereas lower estimates were observed with the Alienation subscale and the Trust and Communication subscales ($r = -.40$ to -.46). The strength of relationship between the combined Parent and Peer scales ranged from $r = .21$ to .47, with negative correlations observed between negative and positively keyed subscales. Slightly larger correlations resulted between scores on similar subscales (i.e., between the two Trust, Communication, and Alienation subscales). This was also true of the scores from Schneider and Younger's study (1996), where larger estimates were noted between the identical scales of the Mother and Father forms. However, the estimates from this second study were smaller ($r = .00$ to .46), which is surprising since one would expect more similar responses on the two parent forms than between parents and peers.

Criterion-related validity of the IPPA is limited to a study by Raja, McGee, and Stanton (1992) who used a shortened form of the original 53-item Peer and combined Parent versions. These shortened forms were developed from the four items with the highest item-total correlation for each subscale, so that each of the Peer and combined Parent forms included 12 items. The sample consisted of 935 adolescents, 15 years of age, enrolled in a study since the age of three in New Zealand. The scores of the participants were grouped into high (top 85%)
and low (bottom 15%) parent- and peer-attachment groups and then compared on scores from the Diagnostic Interview Schedule for Children (DISC-C). Using analysis of variance tests, the results suggested that adolescents who perceived high positive parental relationships reported statistically significantly fewer difficulties in the areas of depression, anxiety, conduct problems, and inattention. Consistent with theory, adolescents who perceived their parents as responding to their needs and providing them with a sense of security, were more likely to be emotionally healthy. Interestingly, the majority of the adolescents (79% girls and 69% boys) were classified as reporting highly positive attachment to parents and peers, suggesting adolescents place emphasis on maintaining both types of relationships.

Extensive research has been carried out using the revised IPPA and measures of other constructs to provide support for the construct validity of the IPPA parent versions. However, and similar to research on the PAQ, no studies have shown how scores on the IPPA correlate with other instruments of attachment. Nonetheless, for the IPPA parent versions, expected positive correlation coefficients have been observed with measures of self-worth. Among 47 students experiencing the transition from grade six to grade seven junior high school, Papini and Roggman (1992) found correlations between the IPPA Mother and Father total scores and the Self-Perception Profile for Children Global Self-Worth scale (Harter, 1985) ranging from $r = .16$ to $.45$. The highest correlations were observed when the students first entered their grade seven year of school, suggesting that the need for felt security during this time of stress or uncertainty may have peaked the parental attachment to offer additional support to the
child's confidence and perceptions of self-worth. Paterson, Pryor, and Field (1995) also observed correlations of $r = .30$ to $.35$ between scores on the IPPA Mother and Father total scores and the Rosenberg Self Esteem Scale (Rosenberg, 1965) among a sample of 493 adolescents. Moreover, correlations of similar strength ($r = .23$ to $.35$) were also found with two subscales of the Offer Self Image Questionnaire (Offer, Ostrov, & Howard, 1982) measuring the adolescents social competence and ability to cope in social situations.

Research has also examined the relationship between IPPA Mother and Father attachment and psychological separation, depressive mood, and anxiety. In a study by Schultheiss and Blustein (1994), responses on the IPPA Mother and Father scales by 139 university students yielded low to moderately-high correlations with positive aspects of psychological separation (as measured by the Conflictual Independence and Attitudinal Independence scales of the Psychological Separation Inventory; Hoffman, 1984). Correlations of $r = -.34$ to $-.71$ between the IPPA Mother and Father and the Conflictual Independence scale suggest that positive parental attachment is associated with lack of parental conflict, anger, and mistrust. Whereas correlations of $r = .32$ to $.62$ with the Attitudinal Independence scale indicate that positive parental attachment is associated with the freedom to have unique ideas and beliefs.

Additionally, and consistent with research on the PAQ, low to moderate negative relationships have been observed between scores from the parent scales and depression or anxiety in young adolescents. Based on responses from 47 adolescents, Papini and Roggman (1992) found that the IPPA Mother and Father scale scores correlated between $r = -.21$ and $-.63$ with scores on the
Children’s Manifest Anxiety Scale (Reynolds & Richmond, 1978). Again, as with perceptions of self-worth, the largest correlations were observed during the transition and the year of grade seven for the students, indicating elevated parental attachment to be associated with lower levels of emotional stress. Correlations of $r = -.28$ to $-.66$ were also found with scores on the Children’s Depression Inventory (Kovacs, 1981). Similar correlations were also observed in Armsden and Greenberg’s 1987 study between the 53-item IPPA combined Parent and Peer scale scores and depression and anxiety (Affective States Index; Bachman, 1970).

Limited research is available on how scores from the peer version relate to other measures. Results of a study by Paterson et al. (1995) indicate that among 493 adolescents, perceived attachment to peers was not related ($r = -.00$) to self-esteem (as measured by the Rosenberg Self Esteem Scale; Rosenberg, 1965) or to their perceptions of coping in social situations ($r = .08$; The Offer Self Image Questionnaire Mastery of the External World Subscale; Offer, Ostrov, & Howard, 1982). However, a low relationship ($r = .31$) was observed between how competent they felt in social situations (The Offer Self Image Questionnaire Social Relationships Subscale) and reported attachment to peers on the IPPA Peer scale. Clearly, more validity information is needed on the meaning of scores derived from the peer attachment version.

To summarize, the revised Inventory of Parent and Peer Attachment (IPPA) developed by Armsden and Greenberg has been widely used in adolescent research. The IPPA is an easily administered, self-report questionnaire from which total attachment scores can be obtained for
relationships with mother, father, and peers. In addition, the three subscale scores (Trust, Communication, and Alienation) may provide greater qualitative detail on characteristics of each relationship. Higher scores on the Trust and Communication subscales and low scores on the Alienation subscale reflect positive parental attachment and interactions. However, further information on the psychometrics of the scores derived from the three forms and subscales (confirmatory analysis of the factor structure across samples) is necessary. The reliability of the scores for the Mother and Father forms is high, though there is little research on such estimates for the Peer form and the three subscales (Trust, Communication, and Alienation). Moreover, research examining the intercorrelations among the three subscales has yielded mixed results and has been limited to the 28-item parent questionnaires. Attachment scores derived from the IPPA have been related to measures of anxiety, depression, psychological separation, and self-worth. Importantly, the highlight of the IPPA is that its development has been heavily based on theory and the contributions by experts that work with adolescents. Additionally, the authors recognize the importance of research and have changed the content and structure of the measure in response to empirical studies and theory.

Correlates of parent-child attachment. Several studies have found meaningful relationships between indices of parent-child attachment and emotional well-being. For example, older adolescents and young adults who perceived positive support, communication, and feelings of trust in their relationships with their parents reported lower levels of anxiety and depression (Armsden & Greenberg, 1987; Kenny & Perez, 1996). When younger
adolescents (grades six through eight) have completed self-report measures of parent-child attachment and adolescent anxiety and depression (Kenny et al., 1993; Papini & Roggman, 1992; Papini, Roggman, & Anderson, 1991), researchers reported even stronger inverse correlations ($r = -.21$ to -.66) between the scores on the attachment and psychological measures. Of particular interest is the study conducted by Papini and Roggman that examined emotional well-being and parent-child attachment among 47 adolescents during the one-year transition from grade six to grade seven. The highest correlations between the scores from the measures were obtained during and after the transition phase. The authors suggest that this is likely the result of the children seeking support from their parents during a stressful period and realizing the positive aspects of their relationships (causing an increase in parental attachment scores). The research discussed fail to disconfirm the propositions advanced by attachment theory whereby the bond between a parent(s) and child offers an environment of security to reduce, or buffer (Armsden & Greenberg) the negative impact of fears encountered when exploring the environment as a child or as an adult (Bowlby, 1982).

The ethological theory of attachment views attachment and caregiving behaviours as necessary for the survival of the infant. In her discussion of the role of the environment as an influence on the self-esteem of a child, Smith (1992) reminds the reader that how a child feels (self-esteem) and evaluates (self-concept) him/herself is affected by the reactions of others. A natural extension of this discussion is to examine the relationship between the parent-child bond, which involves attachment and caregiving behaviours, and the self-
worth of the child. Several studies offer empirical evidence of the moderate positive relationships between parent-child attachment and adolescent self-worth.

In a meta-analysis, Rice (1990) analyzed the results from 30 studies, including 11,751 participants from high school and college. Using Z transformations, Rice found a positive relationship ($r = .40$) among scores from measures of attachment and self-concept/self-esteem. Since 1990, research has revealed moderate relationships between the two constructs (Papini & Roggman, 1992; Paterson, Pryor, & Field, 1995) using different measures of self-worth and parental attachment. Sex differences in perceived parental attachment among adolescents has also resulted, suggesting that self-worth outcomes may be more reliably predicted from scores on a parental attachment measure among female participants (Cotterell, 1992, Kenny et al., 1993; Rice, 1990).

Research also suggests that most adolescents and young adults view their relationships with parents as positive. As discussed earlier with respect to infants and young children, it is also apparent that this positive relationship affects or is at the very least related to buffering some of the deleterious effects that stress and times of change can bring to an adolescent. Given the potential role of parental attachment as affecting positive outcomes, of primary importance is the establishment of these research tools as reliable and valid indices of the relationship between a parent and child.
Chapter Three

Chapter three begins with an outline of the design, participants, procedure and instrumentation of the current study. The remainder of chapter three is dedicated to examining the author’s research questions for the study. The questions were developed for the purpose of providing more comprehensive psychometric information of the Parental Attachment Questionnaire (PAQ, Kenny, 1990) and the Inventory of Parent and Peer Attachment (IPPA, Armsden & Greenberg, 1987).

Design

The current research project was a survey designed to examine the relationships between responses made on two parent-child attachment measures, which purport to measure similar constructs, and measures of trait anxiety and general self-worth. The main form of analysis for this study was correlational. Correlations between subscale scores within each of the attachment scales were calculated. Finally, a statistical analysis of the invariance of the factor structure of the IPPA and PAQ across gender groups was conducted.

In the current study, the construct of attachment was measured using Kenny's (1990) Parental Attachment Questionnaire (PAQ), and the Inventory of Parent and Peer Attachment (IPPA) developed by Armsden and Greenberg (1987). To address the issue of discriminant validity two additional measures, each designed to separately assess anxiety and self-concept, were also completed by the participants in this study. These measures include: the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) and
the Self-Description Questionnaire General Self scale (SDQII; Marsh, 1992). All four questionnaires, as well as the two forms of the PAQ, were administered in a random sequence to control for possible order effects in responding. Demographic information was collected by requesting that each participant complete items to indicate their sex, age, grade, ethnicity, socioeconomic status, and family environment (as provided in Appendix A). All questionnaires were scored by the researcher who is trained and experienced in administering and interpreting Level C standardized and informal measures.

Participant Characteristics

Students in grades eight through twelve were asked to participate in the study. To ensure that all participants were able to read and comprehend the research material, they were required to have a grade five reading level in English, as determined by the school. Finally, parent/guardian consent and student assent were required for participation in the project (Appendix B).

The researcher contacted 429 students through parent letters and school assemblies. From those contacted, 207 students (48%) from three schools, one rural and two urban, volunteered to take part in the project. The male and female respondent composition of the sample included 69 boys (33%) and 138 girls (67%). Students in grades eight through twelve were represented by 62, 19, 46, 51, and 29 students, respectively (30%, 9%, 22%, 25%, and 14%, respectively). Participants indicated their ethnic background by selecting two of the 14 listed categories adapted from the Statistics Canada’s 1996 census (1999a). Compared to the figures provided by Statistics Canada (1999b), the sample matched the largest three ethnic categories: Canadian (29%), British Isles (18%)
and European (20%), within one percentage point. The large ethnic groups that were underrepresented in the sample included: French (6%), Aboriginal (0.5%), and Asian (2%).

Participants were also asked to indicate the type of male and female caregivers that they were referring to on the questionnaires and the socioeconomic status of their family. In the current sample, the majority of female caregivers were biological mothers (n = 205), and two were characterized as adoptive mothers. Among the male caregivers, there were biological fathers, stepfathers, adoptive fathers, and no fathers (N = 189, 9, 2, and 7, respectively). The participants who did not have a father were not included in the data analyses, so the final number of participants was 200.

Because the students were asked to provide the demographic information, it was decided that a more reliable index of socioeconomic status would likely be parent education level, rather than parent income. Socioeconomic status was determined using the average rating for the combined mother and father education levels. The single rating was used to reflect the socioeconomic status of single-caregiver families, though the responses from these participants were not included in further analyses. Responses on the highest level of education level obtained by each parent indicated that the majority of participants had caregivers with post-secondary education. One family had achieved grade eight or less, 13 caregivers completed grades nine to 11, 57 caregivers graduated, 75 had obtained on average one to three years of college or university, and 60 families had an average of four or more years of post-
secondary education. One participant failed to respond on caregivers' education level.

**Procedure**

After receiving approval to conduct the study from The University of British Columbia Behavioural Research Ethics Board, school districts were contacted to discuss the purpose and procedures of the study. Once permission was granted by administrators of the school districts, meetings took place with individual principals, administrators, and teachers of junior secondary and senior secondary high schools to discuss the details of the research and feasibility of conducting the study in the school(s). Each principal also received a letter outlining the main components of the study as discussed in the meeting, and people to contact if he/she had further concerns or questions. Participating school(s) confirmed their support of the project with a letter or verbal agreement indicating their willingness to support the research project. The researcher also discussed the study with students in an assembly as requested by two out of three participating schools. Letters of consent and information to the parents/guardians (provided in Appendix B) were sent home with students in grades eight through twelve at the participating schools. The letter explained the purpose of the research, what was required of the participants, and confidentiality of responses. The consent form provided a parent's permission for their child's participation in the project. Written parental consent was required for all participants in the study.

After obtaining the informed consent, participants were presented with assent forms and the questionnaire packages by their classroom teachers or the
A protocol (provided in Appendix C) was read by the classroom teachers and/or the researcher to the participants outlining the details of the study and what they were required to do as participants in the project. The protocol covered the following areas: purpose of the study, participation is voluntary, student assent, confidentiality, and brief descriptions of the questionnaires to be completed.

The students were provided with a maximum of 60 minutes to complete the package of questionnaires. The participants completed the questionnaires in their classroom or in an alternate room that was specifically assigned for the project and participants. Students for whom parental consent was not provided or who did not wish to take part in the project continued with classwork. All participating students within each school completed the questionnaires during the same periods on the same day to help prevent the potential bias that student discussion may have had on the responses given by participants.

Confidentiality of the names of the participants and their responses were maintained by using identification codes on the research questionnaires. The first sheet of the research package for each student contained a general introduction to the material and directions for completing the questions and statements. This first page (provided in Appendix D: Introduction and Directions) also provided a place for the student to write his/her name (providing the necessary requirement of student assent), to correspond to the identification code listed on each page of the research package. After completing the Introduction and Directions sheet, each participant was asked to separate it from the remaining questionnaires and it was picked up by the classroom teacher and/or researcher and sealed in an
envelope. The pages of assent enabled the researcher to match parental consent forms to each participant prior to entering any responses for analysis. All completed questionnaires were collected by the classroom teacher or researcher and sealed in an envelope. All envelopes were accounted for and picked up by the researcher after the 60-minute period. All consent forms and corresponding student assent forms were kept locked in a secure location by the researcher and destroyed after the analysis of the data was complete.

**Instrumentation**

**Parental Attachment Questionnaire (PAQ).** The Parental Attachment Questionnaire (Kenny, 1987) is a 55-item self-report questionnaire designed to measure the strength of parent-child attachment among adolescents and college students. Two forms are available for the PAQ. The first form enables respondents to rate the characteristics of their relationships with their mother and father separately. The second form requests that a combined rating be provided reflecting both relationships. To address the issue of alternate form reliability, both forms of the PAQ were administered to the participants. Each questionnaire was scored to provide a total score and individual subscale scores for the three PAQ subscales (Affective Quality of Relationships, Parental Fostering of Autonomy, and Parental Role in Providing Emotional Support). Total scale scores range from 55 to 275. The three subscales exclude item 45 because it relates to seeking help from a counsellor or therapist. The Affective Quality of Relationships subscale contains 27 items, of which 16 are reverse keyed; the Fostering of Autonomy subscale contains 14 items, half of which are reverse keyed; and Providing Emotional Support subscale includes 13 items, with only
two reverse keyed. Each item is answered according to a 5-point Likert rating, with high scores indicative of positive attachment. Scores were calculated by totaling the appropriate subscale items. The following 25 (out of 55) items (3, 6, 10, 11, 14, 16, 18, 20, 22, 23, 25, 26, 27, 29, 31, 33, 34, 35, 38, 41, 43, 47, 52, 53, 55) were reverse scored to obtain total and subscale scores in the positive direction.

**Inventory of Parent and Peer Attachment (IPPA) – revised form.** The Inventory of Parent and Peer Attachment (revised) was developed by Armsden and Greenberg (1987) to assess the relationships between parents and their children in adolescence and early adulthood. The three forms of the IPPA (Mother, Father, and Peer versions) were administered to participants of the present study to permit separate ratings of child attachment in the three different relationships. For each form, scores for the total Attachment Scale score and the three attachment subscales (Trust, Communication, and Alienation) are available by totaling the appropriate five-point Likert responses on the 25 items. High scores reflect positive parent-adolescent attachment. For the total Attachment Scale score, the following 10 items were reverse scored for the Mother and Father versions: 3, 6, 8, 9, 10, 11, 14, 17, 18, and 23. To provide a total Attachment Scale score on the Peer form, items 4, 5, 9, 10, 11, 18, 22, and 23 were reverse scored. The Alienation subscale is reverse keyed on all three forms and is scored in the negative direction for a subscale score, with its items reverse-scored to obtain total scale scores.

**Revised Children’s Manifest Anxiety Scale (RCMAS).** Reynolds and Richmond developed the RCMAS in 1978. It is a self-report instrument designed
as a screening measure of the potential causes and level of trait anxiety in children six through 19 years of age. The scale is comprised of 37 dichotomously scored statements at a grade three reading level and takes approximately 15 minutes to complete. The number of “Yes” answers for each scale is summed and converted to a standard T-score with a mean of 50 and standard deviation of 10 for the anxiety scales, and a mean of 10 with a standard deviation of 3 for the Lie scale. For the purposes of the current study only raw scores from the Total Anxiety Scale were used. Scores on the Total Anxiety Scale range from 0 to 28, with larger scores reflecting higher levels of anxiety.

Research on the psychometric properties of the RCMAS has taken place across diverse populations including adequate sample sizes. The majority of internal reliability estimates have yielded coefficients at or above $r_{KR20} = .80$ for the Total Anxiety Scale. Scores from the large standardization sample produced estimates that varied from $r_{KR20} = .42$ to .87 $(N = 4,972)$, depending on the age, gender, and ethnicity of the participants (Reynolds & Richmond, 1978). Studies that have included children from Nigeria (Pela & Reynolds, 1982) and Germany (Boehnke, Silbereisen, Reynolds, & Richmond, 1986) have found that the scores produced estimates in the low .80’s. Stability coefficients of the scores over time have ranged from $r = .88$ $(N = 80)$ across one week to $r = .77$ $(N = 81)$ after five weeks for the Total Anxiety Scale (Wisniewski, Mulick, Genshaft, & Coury (1987). Reynolds (1980, 1985) and Lee, Piersel, Friedlander, and Collamer (1988) examined the construct validity of the scores produced from the RCMAS. From these studies high correlations were found between the RCMAS and the State-Trait Anxiety Inventory for Children trait scale ($r = .85$ and $r = .78$), as well as the
Minnesota Multiphasic Personality Inventory Manifest Anxiety Scale \((r = .76)\), suggesting that the RCMAS is measuring a construct similar to trait anxiety as defined by other measures.

**Self-Description Questionnaire-II (SDQ-II).** In 1992 Marsh developed the SDQ-II as a 10-item measure of adolescent general self-concept. Normative data for the complete 102-item measure, assessing several areas of self-worth, is available for adolescents in grades seven through twelve. The items are structured in a 6-point Likert format (1= “False” and 6=“True”), with half of the items for each subscale reverse keyed to reduce response bias. The complete questionnaire takes approximately 20 minutes to complete. Based on a norming sample of 5,494 students in Australia, Marsh (1992) provides conversion tables for raw subscale and the total scale scores into percentile ranks and nonnormalized T-scores. For the present study, only the General Self subscale was administered as part of the research package. A total score was obtained by summing the responses for ten items included in this subscale, with items 2, 4, 6, 8, and 10 reverse scored. Scores on the General Self subscale range from 10 to 100, with higher scores indicative of higher levels of self-concept.

The psychometric integrity of the SDQ-II is supported by many research projects. From the normative sample \((N = 5,494)\), estimates of internal consistency of the responses ranged from \(r = .83\) to .91 over the 11 subscales with good internal reliability of scores \((r_x = .88)\) on the General Self subscale (Marsh, 1992). Similar estimates were also found among 1,141 grade eight students \((r_x = .85, N = 1,141, \text{Flannery, Reise, & Widaman, 1995})\) and 357 gifted students \((r_x = .83, \text{Plucker, Taylor, Callahan, & Tomchin, 1997})\) to reflect the
consistency of the responses within the subscale. However, it is important to recognize that for this particular subscale, such estimates may be inflated by the redundancy of the items (e.g., item 3 “Most things I do, I do well” and item 5 “Overall, most things I do turn out well”). Among a group of 137 female students, a moderately high test-retest coefficient of $r = .85$ over a seven-week period was found by Marsh and Peart (1988), suggesting that the responses on the subscale are also fairly stable over time.

Evidence of the content and construct validity of SDQ-II scores enable the researcher to derive meaning from the scores. The items for the SDQ-II were adapted from Marsh’s previous self-concept measure, the SDQ, which was initially based upon the theoretical model proposed by Shavelson, Hubner, and Stanton in 1976. Subsequent studies were then carried out to determine if the factor structure and derived scores were invariant across samples, thereby ultimately testing the theoretical basis from which SDQ-II scores are interpreted. Using samples exceeding 5,000, Marsh (1992; 1994) provided empirical evidence for the invariance of the factor structure across cultures and sex groups. Scores on the SDQ-II have also been shown to share a large percentage of common variance with the Multidimensional Self Concept Scale ($r = .80$; Delugach, Bracken, Bracken, and Schicke, 1992). In a study by Plucker et al. (1997), empirical evidence for interpreting the General Self scale score as a measure of overall self-concept was reflected in the high correlations between the General Self scores and the remaining subscale scores (between $r = .44$ and .92). Taken together, it appears that scores produced by the General Self subscale of the SDQ-II are reliable and have evidence of construct validity.
Research Questions

Based upon a review of the attachment literature and previous studies, the present study investigated the psychometric properties of the Parental Attachment Questionnaire (PAQ) and Inventory of Parent and Peer Attachment (IPPA) by answering six questions.

Research Question #1

Did the results provide support for the convergent and discriminant validity of scores on the PAQ and IPPA?

Convergent validity would be provided by moderately large correlations observed between scores measuring the same construct of parent-adolescent attachment. The discriminant validity of scores on the PAQ and IPPA would be supported if the total scale scores between the PAQ and IPPA were larger than those observed between the attachment measures and instruments measuring different, but theoretically related constructs. Therefore, larger correlations between the IPPA and PAQ parent total attachment scores were expected than between total attachment scores on the IPPA or PAQ and the Self-Description Questionnaire II (General Self subscale) or Revised Children's Manifest Anxiety Scale (Total Anxiety Scale).

Hypothesis A: Based upon attachment theory and previous research, it was expected that total parent attachment scores from the IPPA and PAQ would have an inverse relationship with scores on the Revised Children's Manifest Anxiety Scale (Total Anxiety Scale) in the range of $r = -0.20$ to $-0.30$.

Hypothesis B: Based upon attachment theory and previous research, it was expected that the total parent attachment scores from the IPPA and PAQ
would have a positive relationship with scores on the Self-Description Questionnaire II General Self subscale in the range of $r = .25$ to $.45$.

Hypothesis C: Based on the item content it was expected that the scores on the IPPA and PAQ scales would correlate as follows:

i) Positive correlations between all subscale scores on the PAQ.

ii) Positive correlations between and among the Trust and Communication subscale scores within the Parent and Peer versions of the IPPA.

iii) Negative correlations between the Alienation subscale scores and the Trust and Communication subscale scores within the Parent and Peer versions of the IPPA because the Alienation items are reverse scored.

iv) Negative correlations between the Alienation subscale score on the mother, father, and peer versions of the IPPA and the three subscales on the PAQ measures because the Alienation items are reverse scored.

Research Question #2

Using confirmatory analyses, did responses to the PAQ item yield the three factors suggested by Kenny (Affective Quality of Relationships, Fostering of Autonomy, and Providing Emotional Support)?

Research Question #3

To address Kenny's (1987) observation of different factor solutions during the development of the PAQ, structural equations modeling was used to determine if the factor structure for the two forms of the PAQ (separate parent ratings, Mother and Father, and Combined parent ratings) were invariant across male and female participants.
Research Question #4

Using confirmatory analyses, did the IPPA item scores from the sample produce the three factors suggested by Armsden and Greenberg (Trust, Communication, and Alienation)?

Research Question #5

In absence of research examining possible sex differences in the factor structure of the IPPA, structural equations modeling was undertaken to determine if the factor structure of the three forms of the IPPA (Mother, Father, and Peer) was invariant across male and female respondents.

Research Question #6

Were the scores from the mother and father ratings of the PAQ significantly different (correlate less than 0.70) to warrant separate ratings? According to Tabachnick and Fidell (1989), scores that correlate 0.70 or higher provide redundant information and should not be used in multivariate analyses.
Chapter Four

Results

Data Screening

The data were initially screened for missing datum. Missing data among the questionnaires, particularly on the Parent Attachment Questionnaire, became evident with 37 cases (out of a total of 200) identified as missing more than five responses on one questionnaire. As a result, each form/scale (e.g., IPPA Mother, IPPA Father, PAQ Combined) that had five or less missing values (the highest number replaced equal to four per form) were included in the analysis. Those forms that had more than five entries missing had all items labeled as missing and excluded from further analysis. The missing values for items were replaced with the series mean (i.e., mean value of the item across participants). Although such a procedure decreases the variance of an item, this process allowed for the maximum number of cases to be included, increasing the overall variability of responses and power of the analysis. Furthermore, the pairwise procedure for Pearson’s correlation was used in calculating the relationship among the scales and subscales.

Descriptive Statistics

The mean, standard deviation, and range of scores for each measure are provided in Table 1 for the entire sample and by sex grouping. The mean and standard deviation of scores on each subscale is provided in Appendix E for purposes of replication.
Table 1
Descriptive Statistics of Each Measure for the Entire Sample and by Sex Grouping

<table>
<thead>
<tr>
<th>Measure</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPPA Mother Total Scale</td>
<td>200</td>
<td>35-125</td>
<td>95.35</td>
<td>19.08</td>
</tr>
<tr>
<td>Boys</td>
<td>66</td>
<td>35-125</td>
<td>96.79</td>
<td>17.84</td>
</tr>
<tr>
<td>Girls</td>
<td>134</td>
<td>38-125</td>
<td>94.64</td>
<td>19.69</td>
</tr>
<tr>
<td>IPPA Father Total Scale</td>
<td>198</td>
<td>32-125</td>
<td>87.98</td>
<td>21.56</td>
</tr>
<tr>
<td>Boys</td>
<td>66</td>
<td>46-125</td>
<td>91.94</td>
<td>21.02</td>
</tr>
<tr>
<td>Girls</td>
<td>132</td>
<td>32-125</td>
<td>86.00</td>
<td>21.64</td>
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<tr>
<td>IPPA Peer Total Scale</td>
<td>199</td>
<td>47-125</td>
<td>99.90</td>
<td>15.54</td>
</tr>
<tr>
<td>Boys</td>
<td>65</td>
<td>47-121</td>
<td>92.87</td>
<td>16.69</td>
</tr>
<tr>
<td>Girls</td>
<td>134</td>
<td>56-125</td>
<td>103.32</td>
<td>13.76</td>
</tr>
<tr>
<td>PAQ Mother Total Scale</td>
<td>178</td>
<td>102-263</td>
<td>202.62</td>
<td>34.76</td>
</tr>
<tr>
<td>Boys</td>
<td>56</td>
<td>102-252</td>
<td>201.85</td>
<td>33.02</td>
</tr>
<tr>
<td>Girls</td>
<td>122</td>
<td>104-263</td>
<td>202.97</td>
<td>35.66</td>
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<tr>
<td>PAQ Father Total Scale</td>
<td>177</td>
<td>83-262</td>
<td>194.82</td>
<td>40.41</td>
</tr>
<tr>
<td>Boys</td>
<td>55</td>
<td>83-260</td>
<td>197.22</td>
<td>39.58</td>
</tr>
<tr>
<td>Girls</td>
<td>122</td>
<td>84.58-262</td>
<td>193.73</td>
<td>40.89</td>
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<tr>
<td>PAQ Combined Total Scale</td>
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<td>106-263</td>
<td>196.51</td>
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<td>Boys</td>
<td>57</td>
<td>109-257</td>
<td>197.26</td>
<td>32.10</td>
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<tr>
<td>Girls</td>
<td>129</td>
<td>106-263</td>
<td>196.18</td>
<td>36.64</td>
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<td>RCMAS Anxiety Total</td>
<td>199</td>
<td>0-28</td>
<td>10.21</td>
<td>6.26</td>
</tr>
<tr>
<td>Boys</td>
<td>66</td>
<td>0-22</td>
<td>8.69</td>
<td>5.28</td>
</tr>
<tr>
<td>Girls</td>
<td>133</td>
<td>0-28</td>
<td>10.96</td>
<td>6.58</td>
</tr>
<tr>
<td>SDQ Total Score</td>
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<td>10-60</td>
<td>50.92</td>
<td>8.28</td>
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<td>Boys</td>
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<td>15-60</td>
<td>51.05</td>
<td>8.89</td>
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<tr>
<td>Girls</td>
<td>134</td>
<td>10-60</td>
<td>50.86</td>
<td>8.00</td>
</tr>
</tbody>
</table>
Reliability of Measures

Estimates of the internal consistency were produced for the total and subscale scores for each measure in the current sample. Estimates of the reliability of the scores produced from the PAQ, the IPPA, and the Self-Description Questionnaire II, were calculated using Cronbach’s alpha coefficient. As shown on the diagonal of Table 2, internal consistency estimates of the total scores for the Mother, Father, and Combined forms of the PAQ ranged from $r_\alpha = .96$ to .97, lending support to the consistency of responses within the scales. Consistent with previous research, scores from the Affective Quality of Relationships subscale produced the largest internal consistency estimates of $\alpha = .94$ to .96 across the three forms. Table 2 also displays the internal consistency estimates of the responses on the Mother, Father, and Peer versions of the IPPA ranging from $r_\alpha = .80$ to .84. The reliability of the scores from the Self-Worth subscale of the SDQ II was $r_\alpha = .92$. For the RCMAS Total Anxiety Scale, KR-20 was used to calculate the internal consistency of the dichotomously scored measure. Scores provided on this questionnaire yielded internal consistency estimates of $r_{KR20} = .88$. 
Table 2

Correlations Between the Inventory of Parent and Peer Attachment (IPPA), the Parental Attachment Questionnaire (PAQ), the Revised Children's Manifest Anxiety Scale (RCMAS), and the Self-Description Questionnaire (SDQ)

| Measure                              | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  | 25  | 26  |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. IPPA Mother Trust                | .92 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2. IPPA Mother Communication        | .82 | .92 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 3. IPPA Mother Alienation           | -.75| -.74| .83 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 4. IPPA Mother Total                | .94 | .94 | .87 | .80 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 5. IPPA Father Trust                | .54 | .47 | .51 | .55 | .93 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 6. IPPA Father Communication        | .50 | .58 | .57 | .59 | .80 | .92 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 7. IPPA Father Alienation           | -.40| -.38| .56 | -.47| -.69| -.74| .82 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 8. IPPA Father Total                | .53 | .53 | .60 | .59 | .93 | .94 | -.86| .82 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 9. IPPA Peer Trust                  | .24 | .17 | .17 | .21 | .22 | .22 | -.18| .23 | .91 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 10. IPPA Peer Communication         | .18 | .18 | .08 | .17 | .11 | .13 | -.04| .11 | .82 | .92 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 11. IPPA Peer Alienation            | -.16| -.17| .37 | -.23| -.36| -.34| -.39| -.39| -.56| -.34| .71 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 12. IPPA Peer Total                 | .23 | .20 | .22 | .24 | .25 | .25 | -.21| .26 | .95 | .89 | -.69| .84 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 13. PAQ Mother Affective Quality    | .86 | .80 | -.78| .88 | .52 | .56 | -.47| .57 | .24 | .18 | -.22| .25 | .95 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 14. PAQ Mother Autonomy             | .75 | .63 | -.64| .73 | .45 | .48 | -.36| .48 | .26 | .24 | -.20| .27 | .80 | .85 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 15. PAQ Mother Support              | .78 | .82 | -.71| .84 | .49 | .57 | -.42| .42 | .55 | .26 | -.17| .28 | .83 | .83 | .83 |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 16. PAQ Mother Total                | .87 | .82 | -.78| .89 | .53 | .58 | -.46| .58 | .26 | .24 | -.22| .28 | .98 | .88 | .96 |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 17. PAQ Father Affective Quality    | .57 | .53 | -.59| .60 | .86 | .80 | -.70| .87 | .27 | .15 | -.41| .30 | .62 | .51 | .53 | .61 | .96 |     |     |     |     |     |     |     |     |     |     |     |
| 18. PAQ Father Autonomy             | .46 | .38 | -.44| .45 | .77 | .63 | -.61| .73 | .30 | .18 | -.29| .30 | .46 | .53 | .38 | .49 | .83 | .85 |     |     |     |     |     |     |     |     |     |
| 19. PAQ Father Support              | .60 | .63 | -.58| .65 | .79 | .80 | -.64| .82 | .28 | .23 | -.32| .32 | .60 | .49 | .75 | .65 | .82 | .65 | .85 |     |     |     |     |     |     |     |     |
| 20. PAQ Father Total                | .58 | .55 | -.59| .62 | .88 | .81 | -.71| .88 | .30 | .19 | -.39| .32 | .62 | .54 | .56 | .63 | .88 | .89 | .88 | .97 |     |     |     |     |     |     |     |
| 21. PAQ Both Affective Quality      | .77 | .73 | -.72| .81 | .72 | .70 | -.58| .74 | .21 | .15 | -.32| .25 | .85 | .69 | .72 | .84 | .83 | .66 | .73 | .82 | .96 |     |     |     |     |     |     |
| 22. PAQ Both Autonomy               | .68 | .52 | -.53| .63 | .62 | .54 | -.38| .58 | .25 | .16 | -.25| .25 | .67 | .77 | .56 | .72 | .67 | .71 | .68 | .70 | .78 | .85 |     |     |     |     |     |
| 23. PAQ Both Support                | .73 | .74 | -.63| .77 | .70 | .67 | -.54| .71 | .26 | .23 | -.25| .25 | .75 | .61 | .81 | .79 | .73 | .60 | .82 | .77 | .84 | .66 | .84 |     |     |     |     |
| 24. PAQ Both Total                  | .79 | .73 | -.70| .81 | .74 | .71 | -.56| .75 | .25 | .18 | -.30| .28 | .84 | .74 | .75 | .85 | .82 | .70 | .77 | .84 | .98 | .86 | .90 | .96 |     |     |
| 25. RCMAS Anxiety                   | -.36| -.28| -.28| -.37| -.37| -.35| -.34| -.35| -.29| -.25| -.36| -.43| -.34| -.35| -.42| -.45| -.42| -.31| -.44| .88 |     |     |     |     |     |     |
| 26. SDQ II                           | .47 | .42 | .47 | .49 | .51 | .47 | -.35| .50 | .33 | .24 | -.39| .36 | .44 | .39 | .37 | .44 | .53 | .44 | .50 | .53 | .56 | .48 | .49 | .56 | -.55| .92 |

Note: Reliability coefficients (Cronbach's alpha and KR 20) of scores on the main diagonal and pairwise Pearson correlations below main diagonal.

All correlations are significant at p<.01
IPPA Mother n=200; IPPA Father n=198; IPPA Peer n=199; PAQ Mother n=178; PAQ Father n=179; PAQ Both n=186; RCMAS n=199; SDQ II n=200
Construct Validation

**Convergent and discriminant validity.** The strength of the correlation coefficients were used to examine the convergent and discriminant validity of the scores from the PAQ and IPPA. For scores from a measure to display convergent validity, they must have moderately high correlations with scores from instruments purporting to measure the same construct. Discriminant validity is then demonstrated when the magnitude of the correlations between scores from measures of different, but related, constructs is less than those between scores suggesting the same constructs. Pearson's correlation coefficient was used to calculate the degree of relationship between total scores on the measures and between the subscales within each of the attachment measures (as provided in Table 2).

In response to the first research question, larger correlations were found between the IPPA and PAQ parent total attachment scores than between total attachment scores on the IPPA or PAQ and the SDQ II General Self subscale or the RCMAS Total Anxiety Scale. For example, the highest correlation between scores on an attachment (PAQ Both) and criterion measure (SDQ-II) was $r(177) = .56$. Conversely, correlations between total scores on attachment measures ranged from $r = .58$ to $.89$, with higher correlations between same-parent scores ($r = .88$ and $.89$) than between Mother and Father scores ($r = .58$ to $.63$).

Consistent with previous research, the total parent attachment scores from the IPPA (Mother and Father forms) and PAQ (Mother/Father and Both forms) had an inverse relationship with scores on the RCMAS Total Anxiety Scale. These relationships ranged from $r = -.36$ to -.44. Correlations with the total
parent attachment scores and the SDQ II General Self subscale were all positive and ranged from $r = .44$ to $.56$.

As expected from item content and scoring direction, participant scores provided positive correlation coefficients within and between the three subscales of the Mother, Father, and Combined forms of the PAQ ranging from $r(176-177) = .38$ to $.85$. Among the two positively keyed subscales of the IPPA (Trust and Communication), there were positive correlations within and across the three forms (Mother, Father, and Peer) of the IPPA. Within the forms, the relationship between these two scales remained in the low .80's. Across forms however, the correlations were between $r = .47$ to $.58$ between the two parent forms, and $r = .11$ to $.24$ between the parent and peer forms. Similarly, the correlations between the IPPA Alienation subscale score (negatively keyed) and the Trust and Communication subscale scores, although all negative, were generally higher within each scale of the IPPA than across the parent and peer scales. Pearson coefficients ranged from $r = -.34$ to $-.75$ within the forms, and $r = -.16$ to $-.39$ between the forms.

**Factor Structures.** Confirmatory analysis of the factor structures for each attachment measure was conducted using LISREL 8.30. For replication, the syntax is provided in Appendix F. The fit indices used to decide goodness-of-fit were based upon the characteristics of each fit index as provided by Anderson and Gerbing (1988); Bollen (1990); Loehlin (1998); Maruyma (1997); Mulaik, James, Van Alstine, Bennett, Lind, and Stilwell (1989); and Tanaka (1993). For a tested model to be accepted, four out of the five indices indicating a good measurement model were required. This standard was set because the current
sample of participants was not randomly selected and there was an unequal
distribution of gender and grade. If only one index was required to indicate a
good measurement model, the probability of Type II error may have increased
due to the nature of the sample. The chi-square statistic reflects a good
measurement model when the probability of failure to reject the null hypothesis
(i.e., that there are not three factors) exceeds the value of .05. The root mean
square error of approximation indicates that the observed responses match the
measurement model when the values are less than .05. According to Mulaik et
al. (1989), indices such as the RMSEA and Expected Cross-Validation Index
(ECVI) are referred as "lack-of-fit" indices because they require values
approaching zero as a reflection of a well-fit model. Fit indices then, such as the
Parsimony Goodness of Fit Index (PGFI), Adjusted Goodness of Fit Index
(AGFI), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), and the Non-
normed Fit Index (NNFI) reflect a fit of the measurement model to the data with
values approaching 1.0, minimum of .90. An examination of Tables 3 and 4
suggest that the confirmatory analysis of the scores produced from the PAQ and
the IPPA failed to support the three-factor measurement models proposed by
Kenny (1987) for the 70-item PAQ and by Armsden and Greenberg (1987) for the
IPPA. Consistent with the guidelines mentioned above, values on the $\chi^2$
had a
low probability of failing to reject the null hypothesis, the RMSEA was well above
.05 (which is typically used as the maximum value), and the fit-indices did not
exceed .90. Values of .90 of higher on the NNFI were only realized in the
analyses of the IPPA parent scales when the measurement models were altered.
Table 8

Testing Equality of the Factor Structure Across Girls (n=134) and Boys (n=66) on the IPPA Mother Scale

Model: Armsden & Greenberg's Three-Factor Measurement Model

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$\Delta \chi^2$</th>
<th>RMSEA</th>
<th>ECVI</th>
<th>PGFI</th>
<th>GFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>90% C.I.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1: Same # and form of free and fixed elements across groups. (LX=SP)</td>
<td>889.93</td>
<td>544</td>
<td>-</td>
<td>0.08</td>
<td>0.071-0.090</td>
<td>5.56</td>
<td>1.52</td>
<td>0.91</td>
</tr>
<tr>
<td>H2: Same relative patterns and starting values. (LX=PS)</td>
<td>889.93</td>
<td>544</td>
<td>0.00</td>
<td>0.08</td>
<td>0.071-0.090</td>
<td>5.56</td>
<td>1.52</td>
<td>0.91</td>
</tr>
<tr>
<td>H3: Same loadings across groups. (LX=IN)</td>
<td>895.34</td>
<td>569</td>
<td>+5.41</td>
<td>0.076</td>
<td>0.066-0.085</td>
<td>5.34</td>
<td>1.59</td>
<td>0.91</td>
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<tr>
<td>H4: Same loadings and error terms across groups. (LX=IN TD=IN)</td>
<td>1576.53</td>
<td>594</td>
<td>+681.19</td>
<td>0.13</td>
<td>0.12-0.13</td>
<td>8.53</td>
<td>1.27</td>
<td>0.70</td>
</tr>
<tr>
<td>H5: Loadings, error terms, and factor intercorrelations same across groups (LX=IN TD=IN PH=IN)</td>
<td>1606.58</td>
<td>597</td>
<td>+30.05</td>
<td>0.13</td>
<td>0.12-0.13</td>
<td>8.65</td>
<td>1.27</td>
<td>0.69</td>
</tr>
</tbody>
</table>

*p>.05
Table 9

Testing Equality of the Factor Structure Across Girls (n=132) and Boys (n=66) on the IPPA Father Scale

Model: Three-Factor Measurement Model with Items 3, 6, & 14 to Load on the Alienation Factor

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$\Delta \chi^2$</th>
<th>RMSEA 90% C.I.</th>
<th>ECVI</th>
<th>PGFI</th>
<th>GFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Same # and form of free and fixed elements across groups. (LX=SP)</td>
<td>1231.28</td>
<td>544</td>
<td>-</td>
<td>0.11-0.12</td>
<td>7.36</td>
<td>1.04</td>
<td>0.62</td>
<td>0.80</td>
</tr>
<tr>
<td>H2: Same relative patterns and starting values. (LX=PS)</td>
<td>1231.28</td>
<td>544</td>
<td>0.00</td>
<td>0.11-0.12</td>
<td>7.36</td>
<td>1.04</td>
<td>0.62</td>
<td>0.80</td>
</tr>
<tr>
<td>H3: Same loadings across groups. (LX=IN)</td>
<td>1289.54</td>
<td>569</td>
<td>+58.26</td>
<td>0.11-0.12</td>
<td>7.41</td>
<td>1.05</td>
<td>0.60</td>
<td>0.80</td>
</tr>
<tr>
<td>H4: Same loadings and error terms across groups. (LX=IN TD=IN)</td>
<td>1511.36</td>
<td>594</td>
<td>+221.82</td>
<td>0.12-0.013</td>
<td>8.28</td>
<td>1.03</td>
<td>0.56</td>
<td>0.78</td>
</tr>
<tr>
<td>H5: Loadings, error terms, and factor intercorrelations same across groups (LX=IN TD=IN PH=IN)</td>
<td>1504.34</td>
<td>597</td>
<td>-7.02</td>
<td>0.12-0.13</td>
<td>8.22</td>
<td>1.04</td>
<td>0.56</td>
<td>0.78</td>
</tr>
</tbody>
</table>

*p> .05
Testing the Equality of Structures Between Groups. Using LISREL 8.30, structural equations modeling determined the level of equality between scores obtained from the male and female respondents. Invariance of the factor structure was examined by comparing the fit of male responses against those obtained by the female respondents. An independent confirmatory analysis of the girls’ scores was initially conducted for each scale of the PAQ and IPPA to obtain the best fit against which to measure invariance. The levels of invariance examined (using the syntax provided in Appendix G) were as follows, beginning with the least restrictive model analysis.

(a) Least restrictive model equating the same number of factors and the structural relationship between the factors.
(b) Equating the pattern and starting values of the coefficients between the factors and observed variables (lambda X). Thus, the model was tested to determine if the relative size of each of the will be equal across both groups.
(c) Equating the loadings across the two groups (lambda X values).
(d) Equating the errors of measurement (theta-delta values) across the two groups.
(e) Most restrictive model will equate the correlations between the factors (phi values).

For the PAQ Mother and Father scales, the measurement model from the girls’ responses, against which the boy’s responses were tested for fit, included items one and thirteen being placed on the Parents as Source of Support Subscales, rather than the Affective Quality of Relationships Subscales. For the IPPA Father
scale, the measurement model was altered to include items three, six, and fourteen to load on the Alienation subscale or factor, rather than on the Trust and Communication factors. For a level of invariance to be accepted, five out of the six indices indicating good model fit were required. As shown in Tables 5 through 10, the analyses failed to support the invariance of the factor structures across female and male adolescents for the Mother, Father, and Combined scales of the PAQ and the Mother, Father, and Peer scales of the IPPA. Comparatively however, the invariance analyses of the PAQ scales appeared to produce more favourable results, with the $\chi^2$ and the RMSEA suggesting invariance of the factor structure of the Mother scale. However, with the ECVI and PGFI well above the typical index range of zero to one, likely resulting from the non-normality of the data, and the analyses not producing a CFI index value, it was not possible to support the invariance of the model across sexes.
Table 5

Testing Equality of the Factor Structure Across Girls (n=122) and Boys (n=56) on the PAQ Mother Scale

Model: Three-Factor Measurement Model with Items 1 & 13 to Load on the Support Factor

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$\Delta \chi^2$</th>
<th>RMSEA 90% C.I.</th>
<th>ECVI</th>
<th>PGFI</th>
<th>GFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Same # and form of free and fixed elements across groups. (LX=SP)</td>
<td>900.70*</td>
<td>2748</td>
<td>-</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>NA</td>
</tr>
<tr>
<td>H2: Same relative patterns and starting values. (LX=PS)</td>
<td>900.70*</td>
<td>2748</td>
<td>0.00</td>
<td>0.0-0.0</td>
<td>18.14</td>
<td>1.50</td>
<td>0.81</td>
<td>NA</td>
</tr>
<tr>
<td>H3: Same loadings across groups. (LX=IN)</td>
<td>925.27*</td>
<td>2802</td>
<td>+24.57</td>
<td>0.0-0.0</td>
<td>17.83</td>
<td>1.52</td>
<td>0.80</td>
<td>NA</td>
</tr>
<tr>
<td>H4: Same loadings and error terms across groups. (LX=IN TD=IN)</td>
<td>937.15*</td>
<td>2856</td>
<td>+11.88</td>
<td>0.0-0.0</td>
<td>17.52</td>
<td>1.54</td>
<td>0.80</td>
<td>NA</td>
</tr>
<tr>
<td>H5: Loadings, error terms, and factor intercorrelations same across groups</td>
<td>949.67*</td>
<td>2859</td>
<td>+12.52</td>
<td>0.0-0.0</td>
<td>17.51</td>
<td>1.54</td>
<td>0.80</td>
<td>NA</td>
</tr>
</tbody>
</table>

*p > .05
Table 6

Testing Equality of the Factor Structure Across Girls (n=122) and Boys (n=55) on the PAQ Father Scale

Model: Three-Factor Measurement Model with Items 1 & 13 to load on the Support Factor

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$\Delta \chi^2$</th>
<th>RMSEA 90% C.I.</th>
<th>ECVI</th>
<th>PGFI</th>
<th>GFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Same # and form of free and fixed elements across groups. (LX=SP)</td>
<td>3187.25</td>
<td>2748</td>
<td>-</td>
<td>0.043</td>
<td>0.036-0.049</td>
<td>20.75</td>
<td>1.45</td>
<td>0.79</td>
</tr>
<tr>
<td>H2: Same relative patterns and starting values. (LX=PS)</td>
<td>3187.25</td>
<td>2748</td>
<td>0.00</td>
<td>0.043</td>
<td>0.036-0.049</td>
<td>20.75</td>
<td>1.45</td>
<td>0.79</td>
</tr>
<tr>
<td>H3: Same loadings across groups. (LX=IN)</td>
<td>3203.78</td>
<td>2802</td>
<td>+16.53</td>
<td>0.033-0.047</td>
<td>20.23</td>
<td>1.47</td>
<td>0.78</td>
<td>0.88</td>
</tr>
<tr>
<td>H4: Same loadings and error terms across groups. (LX=IN TD=IN)</td>
<td>3584.65</td>
<td>2856</td>
<td>+380.87</td>
<td>0.048-0.060</td>
<td>21.79</td>
<td>1.25</td>
<td>0.65</td>
<td>0.68</td>
</tr>
<tr>
<td>H5: Loadings, error terms, and factor intercorrelations same across groups (LX=IN TD=IN PH=IN)</td>
<td>3588.18</td>
<td>2859</td>
<td>+3.53</td>
<td>0.048-0.060</td>
<td>21.77</td>
<td>1.25</td>
<td>0.65</td>
<td>0.67</td>
</tr>
</tbody>
</table>

*p > .05
Table 7

Testing Equality of the Factor Structure Across Girls (n=129) and Boys (n=57) on the PAQ Combined Scale

Model: Kenny's Measurement Model

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$\Delta \chi^2$</th>
<th>RMSEA</th>
<th>ECVI</th>
<th>PGFI</th>
<th>GFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Same # and form of free and fixed elements across groups. (LX=SP)</td>
<td>3575.17</td>
<td>2748</td>
<td>-</td>
<td>0.057</td>
<td>0.052-0.062</td>
<td>21.84</td>
<td>1.48</td>
<td>0.80</td>
</tr>
<tr>
<td>H2: Same relative patterns and starting values. (LX=PS)</td>
<td>3575.17</td>
<td>2748</td>
<td>0.00</td>
<td>0.056</td>
<td>0.052-0.062</td>
<td>21.84</td>
<td>1.48</td>
<td>0.80</td>
</tr>
<tr>
<td>H3: Same loadings across groups.</td>
<td>3596.63</td>
<td>2802</td>
<td>+21.46</td>
<td>0.062</td>
<td>0.050-0.061</td>
<td>21.37</td>
<td>1.48</td>
<td>0.79</td>
</tr>
<tr>
<td>(LX=IN)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4: Same loadings and error terms across groups. (LX=IN TD=IN)</td>
<td>3872.66</td>
<td>2856</td>
<td>+276.03</td>
<td>0.063</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(LX=IN TD=IN PH=IN)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p > .05
Table 8

Testing Equality of the Factor Structure Across Girls (n=134) and Boys (n=66) on the IPPA Mother Scale

Model: Armsden & Greenberg’s Three-Factor Measurement Model

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$\Delta \chi^2$</th>
<th>RMSEA 90% C.I.</th>
<th>ECVI</th>
<th>PGFI</th>
<th>GFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Same # and form of free and fixed elements across groups. (LX=SP)</td>
<td>889.93</td>
<td>544</td>
<td>-</td>
<td>0.08</td>
<td>0.071-0.090</td>
<td>5.56</td>
<td>1.52</td>
<td>0.91</td>
</tr>
<tr>
<td>H2: Same relative patterns and starting values. (LX=PS)</td>
<td>889.93</td>
<td>544</td>
<td>0.00</td>
<td>0.08</td>
<td>0.071-0.090</td>
<td>5.56</td>
<td>1.52</td>
<td>0.91</td>
</tr>
<tr>
<td>H3: Same loadings across groups. (LX=IN)</td>
<td>895.34</td>
<td>569</td>
<td>+5.41</td>
<td>0.076</td>
<td>0.066-0.085</td>
<td>5.34</td>
<td>1.59</td>
<td>0.91</td>
</tr>
<tr>
<td>H4: Same loadings and error terms across groups. (LX=IN TD=IN)</td>
<td>1576.53</td>
<td>594</td>
<td>+681.19</td>
<td>0.13</td>
<td>0.12-0.13</td>
<td>8.53</td>
<td>1.27</td>
<td>0.70</td>
</tr>
<tr>
<td>H5: Loadings, error terms, and factor intercorrelations same across groups (LX=IN TD=IN PH=IN)</td>
<td>1606.58</td>
<td>597</td>
<td>+30.05</td>
<td>0.13</td>
<td>0.12-0.13</td>
<td>8.65</td>
<td>1.27</td>
<td>0.69</td>
</tr>
</tbody>
</table>

*p > .05
Table 9

Testing Equality of the Factor Structure Across Girls (n=132) and Boys (n=66) on the IPPA Father Scale

Model: Three-Factor Measurement Model with Items 3, 6, & 14 to Load on the Alienation Factor

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$\Delta \chi^2$</th>
<th>RMSEA</th>
<th>ECVI</th>
<th>PGFI</th>
<th>GFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Same # and form of free and fixed elements across groups. (LX=SP)</td>
<td>1231.28</td>
<td>544</td>
<td>-</td>
<td>0.11</td>
<td>7.36</td>
<td>1.04</td>
<td>0.62</td>
<td>0.80</td>
</tr>
<tr>
<td>H2: Same relative patterns and starting values. (LX=PS)</td>
<td>1231.28</td>
<td>544</td>
<td>0.00</td>
<td>0.11-0.12</td>
<td>7.36</td>
<td>1.04</td>
<td>0.62</td>
<td>0.80</td>
</tr>
<tr>
<td>H3: Same loadings across groups. (LX=IN)</td>
<td>1289.54</td>
<td>569</td>
<td>+58.26</td>
<td>0.11</td>
<td>7.41</td>
<td>1.05</td>
<td>0.60</td>
<td>0.80</td>
</tr>
<tr>
<td>H4: Same loadings and error terms across groups. (LX=IN TD=IN)</td>
<td>1511.36</td>
<td>594</td>
<td>+221.82</td>
<td>0.12-0.13</td>
<td>8.28</td>
<td>1.03</td>
<td>0.56</td>
<td>0.78</td>
</tr>
<tr>
<td>H5: Loadings, error terms, and factor intercorrelations same across groups (LX=IN TD=IN PH=IN)</td>
<td>1504.34</td>
<td>597</td>
<td>-7.02</td>
<td>0.12-0.13</td>
<td>8.22</td>
<td>1.04</td>
<td>0.56</td>
<td>0.78</td>
</tr>
</tbody>
</table>

*p > .05
Table 10

Testing Equality of the Factor Structure Across Girls (n=134) and Boys (n=65) on the IPPA Peer Scale

Model: Armsden & Greenberg's Three-Factor Measurement Model

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>$\Delta \chi^2$</th>
<th>RMSEA</th>
<th>ECVI</th>
<th>PGFI</th>
<th>GFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>90% C.I.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1: Same # and form of free and fixed elements across groups. (LX=SP)</td>
<td>1263.30</td>
<td>544</td>
<td>-</td>
<td>0.12</td>
<td>0.11-0.12</td>
<td>7.49</td>
<td>1.03</td>
<td>0.62</td>
</tr>
<tr>
<td>H2: Same relative patterns and starting values. (LX=PS)</td>
<td>1263.30</td>
<td>544</td>
<td>0.00</td>
<td>0.12</td>
<td>0.11-0.12</td>
<td>7.49</td>
<td>1.03</td>
<td>0.62</td>
</tr>
<tr>
<td>H3: Same loadings across groups. (LX=IN)</td>
<td>1279.64</td>
<td>569</td>
<td>+16.34</td>
<td>0.12</td>
<td>0.10-0.12</td>
<td>7.32</td>
<td>1.07</td>
<td>0.61</td>
</tr>
<tr>
<td>H4: Same loadings and error terms across groups. (LX=IN TD=IN)</td>
<td>1402.82</td>
<td>594</td>
<td>+123.18</td>
<td>0.12</td>
<td>0.11-0.13</td>
<td>7.69</td>
<td>1.07</td>
<td>0.59</td>
</tr>
<tr>
<td>H5: Loadings, error terms, and factor intercorrelations same across groups (LX=IN TD=IN PH=IN)</td>
<td>1414.90</td>
<td>597</td>
<td>+12.18</td>
<td>0.12</td>
<td>0.11-0.13</td>
<td>7.72</td>
<td>1.08</td>
<td>0.59</td>
</tr>
</tbody>
</table>

*p > .05
Chapter Five

Discussion

The results of this study, together with previous research, provide further direction for the appropriate use and interpretation of parent-adolescent attachment measures; emphasize the potential importance of a child's bond with his/her parents, and point to new directions in future research. The purpose of the current research project was to contribute to information on the reliability and validity of scores obtained from parent-adolescent attachment measures. Such information was deemed necessary because one of the directions in attachment research has been in studying the relationship between attachment and adolescent well-being and peer relationships. However, in absence of psychometric information on the measures, the use of these measures in school systems to address the well-being of students is inappropriate and may lead to inappropriate diagnosis and referrals. The current study sought to examine the reliability and validity of two attachment questionnaires that have been developed for adolescent populations: the Parental Attachment Questionnaire (PAQ) and the Inventory of Parent and Peer Attachment (IPPA).

The internal consistency of the PAQ, IPPA, Self-Description Questionnaire –II (SDQ-II), and Revised Children’s Manifest Anxiety Scale (RCMAS) was high, providing an adequate foundation from which to explore the convergent and discriminant validity and factor structure of the two attachment self-reports. In addition, the internal reliability of scores on the revised IPPA provide valuable psychometric information, which to this point, has been limited to the previous version of the IPPA. Based on responses from the current sample
of students in grades eight through twelve, the consistency of responses for the total scale scores on the IPPA fell in the moderately high range (.80 to .84). At first glance these estimates appear somewhat low, and limiting for further validation analyses. However, upon further examination, the total scores of the Mother, Father, and Peer scales are limited by the items comprising the Alienation subscale with reliability estimates of $r = .71 \text{ to } .83$; whereas the Trust and Communication subscale scores displayed consistencies of $r = .91 \text{ to } .93$. Nonetheless, the lower than expected internal consistency of the IPPA scales may have reduced the correlations between the scores of the IPPA and with other measures.

The first research question and accompanying hypotheses were posed to address the convergent and discriminant validity of the PAQ and IPPA. Simply stated, if the PAQ and IPPA were measuring similar constructs of attachment, scores within and between the parent forms of these measures should be more related than the scores between the attachment and anxiety or self-esteem questionnaires. To begin with, the largest correlations, as one might expect, occurred across measures when the same parent figure was rated (correlations of .88 and .89). While attachment to mother and fathers was moderately correlated regardless of which scale was used to assess attachment ($r$ ranging from .58 to .63). In 1992, Sperling et al. suggested that the characteristics of cognitive representations would be most similar within a bond category (e.g., parent, sibling, or peer). However, the strength of correlations between scores measuring attachment to the same parent and those between scores rating different parental figures, suggest the possibility of different constructs. In other
words there may be a genuine difference in the cognitive mental representations and experiences that adolescents have with individuals sharing the same bond category, such as between the mother and father.

For all parent scales the correlations between the PAQ and IPPA attachment total scores were higher ($r = .58$ to $.89$) than those between the attachment and anxiety or self-esteem self-reports ($r = -.36$ to $.56$). Although the correlations with the criterion measures were somewhat higher than initially hypothesized, moderate relationships have been found in the research between the IPPA, PAQ and measures of anxiety or general self-esteem, especially among female participants (Armsden & Greenberg, 1987; Cotterell, 1992; Kenny et al., 1993; Papini & Roggman, 1992). Thus, the inflated correlations among the attachment and criterion scores in the current study may be partly attributed to the larger number of female participants (67%). In addition, all of the instruments used in this research project were self-report, thus larger correlations may also be influenced by shared method variance.

As a follow up to a dearth of published research on the relationship of subscale scores, particularly for the IPPA, the directionality of the intersubscale correlations was examined. Based on item content and scoring directions, it was suggested that positively keyed subscale scores within and between the two measures would have positive correlations, while there would be negative relationships between the Alienation subscale scores (negatively keyed) and the remaining IPPA and PAQ subscales. The analyses of responses from the current sample supported the stated hypotheses. That is, the only negative correlations that emerged occurred between the Alienation subscale scores of the IPPA and
the remaining subscales of the IPPA and PAQ, across all forms (Mother, Parent, Peer, and Combined). The scores on the IPPA demonstrated correlations ranging from $r = -.38$ to $.58$, with more appropriate directionality than those obtained by Schneider & Younger (1996), whose results may have been restricted in range among a sample of 63 grade-ten students.

As part of the construct validity study, one would also expect that the construct of peer attachment would be more related to the scales of parent attachment than anxiety or self-esteem. However, this was not the outcome from the current sample. In fact, the responses from the IPPA Peer attachment scale showed similar degrees of relationship with all measures used in the study, and the same magnitude of correlations with the parent scales as shown in previous studies (Armsden & Greenberg, 1987; Raja, McGee, & Stanton, 1992). One of the reasons for the lack of construct validity in the peer scale may be that although the items possess high internal consistency, it may not be a valid measure of peer attachment.

The crux of the difficulty in determining the role of parent attachment relative to that of peer attachment may be that the theoretical construct as conceived by Bowlby (1982) is being inappropriately operationalized in measurement. Recall that the primary purpose of parent-child attachment and child attachment behaviour is to protect the child from harm and to provide a safe environment from which the child can engage in exploratory behaviour to develop and learn. Attachment behaviour in human beings, such as crying or calling out, is directed then “towards someone conceived of as better able to cope with the current situation” (Bowlby, 1982, p. 377). Simply put, attachment behaviour may
not be what is observed in peer relationships because peers are not typically in a position, like parents, to offer physical protection and safety when a child is threatened or experiencing anxiety. This safe haven, which has evolved to ensure the survival of many species, may or may not be what is measured when discussing peer attachment. If this is the case, then it will be important to make the distinction between instruments that purport to measure peer relationships versus attachment.

Unless there is evidence that peers take the place, filling the same role, of parents during adolescence, the construct of peer attachment is likely qualitatively different from parent attachment. From an ethological framework, if peers, among animals and human beings, had evolved to a position of power to offer the same felt security and emotional support of parents, then we would expect that continued parental investment would have lost its purpose and cease to exist in its current form. However, among human beings, most parents continue to clothe, feed, nurture, and support their children throughout adolescence and into adulthood. The continued presence of these behaviours suggests that parents must be fulfilling some role in the survival of their young, with peer behaviour/attachment fulfilling a qualitatively different role. Thus, one would not expect the IPPA Peer scale to provide a valid indicator of peer attachments because 68% of the scale items have the exact wording as those on the IPPA parent attachment scales, while the remaining items focus on accessing friends for the purpose of disclosure and dialogue. Thus, it would appear that the IPPA Peer scale may be measuring two very qualitatively, and theoretically different constructs. This misinterpretation may also be why there
are mixed messages among studies (Armsden & Greenberg, 1987; Cotterell, 1992; Lacovetta, 1975; Paterson et al.; 1994; Schneider & Younger, 1996) on the correlation or role of parent-child attachment and peer relationships, some showing moderate to high relationships, others showing negligible correlations.

The stability of the factor structures of the PAQ and IPPA, and the invariance of the structures across male and female participants comprised the second part of the construct validity analysis. Based on responses from the current sample, the confirmatory factor analysis failed to support the factor structure of the PAQ and IPPA. At the time of this research, Kenny (1987) had conducted the only factor analysis of the Parental Attachment Questionnaire during the development of the PAQ. At that time, the development of the scales was based upon principal components analysis, where the pattern of responses guided the subscale/factor make-up, not theory. In addition, no follow-up factor analysis was reported in the literature when the PAQ was reduced from 70 to 55 items. To this end, the current study, using a reasonably large sample, has failed to support the current item and corresponding subscale organization as a valid method of analysis and interpretation. Thus, it appears that the items of the PAQ may require reorganization, from a theoretical standpoint, as the first stage of operationalizing the attachment construct. Then, the confirmatory analysis of the measurement model in a cross validation sample would be necessary before scores, other than the total attachment score, could be used when interpreting the characteristics of parent-child attachment.

Similar results were found on the confirmatory analysis of the Inventory of Parent and Peer Attachment. Using advanced statistical analyses, the current
study has made a valuable contribution in providing information on the proposed subscales of the revised IPPA. The results suggest that the factor structure of the revised IPPA is not a valid method of interpreting responses. In other words, the responses from the students in grades eight through twelve did not coincide with the measurement model proposed by Armsden and Greenberg (1987) for the IPPA. Although, to this date no known studies have carried out factor analytic analyses on the revised IPPA, Schneider and Younger (1996) suggested that the current subscales may not be an appropriate level of interpretation because of the high intercorrelations between the scales. Thus, and based upon the correlational and factor analyses, the IPPA and PAQ parent scales can be used as measures of attachment. However, interpretation should be restricted to the total scale scores as there is not enough evidence to suggest that the subscales are a valid level of interpretation.

Efforts to obtain valid measurement models for the IPPA and PAQ scales based on responses from the female participants also failed. Nonetheless, maximum modifications indices were used to obtain the best fitting measurement models for the current female data. Based on these models, the invariance testing of the factor structures was then conducted on the responses made by the male students. The invariance testing was carried out in response to previous research by Kenny (1987) in her pilot of the PAQ, where she suggested the possibility of different factors showing up in female and male samples. Not surprisingly then, the current study failed to support that the same measurement models apply for male and female students on the Parental Attachment Questionnaire, as well as the Inventory of Parent and Peer Attachment.
studies (Kenny, 1994; Kenny & Donaldson, 1991) have found "gender
differences" in strength of parent attachment bonds based upon the statistical
significance between the mean scores in the two groups. In absence of construct
validity data to support the subscales, or factors, of the PAQ and IPPA, such
conclusions may be inappropriate because different factor structures suggest
that the construct of attachment is defined differently for boys and girls. This
important difference affects interpretation and is not reflected in the simple
examination of mean differences, providing justification for the use of more
complex analyses when examining possible gender differences in scores.
Therefore, different items and/or measurement models are necessary.
Alternatively, if after cross validation studies there do not appear to be gender
differences across the scores, then the method of sampling can be altered. It
would not be necessary to have a sample comprised equally of male and female
participants to reach valid conclusions that could be generalized to the
population.

The final question that was examined during this project concerned the
appropriate use of the PAQ Combined scale to describe parent-adolescent
attachment. As discussed in chapter three, researchers have based the use of
the Combined scale on a single pilot study (discussed in Kenny, 1987) which
suggested that the scores on the Mother and Father forms were not statistically
significantly different to warrant separate ratings. However, based upon the
guideline provided by Tabachnick and Fidell (1989), results from the current
study suggest that separate parent ratings are indeed warranted because there
is not enough shared variance to use a single rating. Let it never be said that
researchers do not learn from their participants when a participant writes on his/her protocol that "You can't put both parents in the same category."

Limitations of the Study

Although many valuable insights were gained from the present study, the results should be interpreted in light of the limitations of the research project. To begin with, the sample size, although appropriate according to some researchers (Anderson & Gerbing, 1988; Tanaka, 1987), may have contributed to a larger standard error and limited the generalizability of the results from the confirmatory analysis and structural equations modeling. Secondly, the current sample consisted of student volunteers from two-parent families, where a randomly selected sample of participants including both single and dual parent families would have strengthened the generalizability of the results. Moreover, the sample was disproportionately female, and did not represent an equal number of students across grades eight to twelve. This may have affected the convergent and discriminant validity results, as well as making it very difficult to conduct a true test of invariance. Lastly, the method of scoring the ethnic background for demographic information may have misrepresented the characteristics of the current sample. All participants were instructed on the protocol to select two ethnic backgrounds. For those participants who selected more than two, the researcher selected the first two responses, as dictated by the order on the protocol. This may have inflated the percentage of the large ethnic groups and reduced the percentage of the smaller groups because the order was based on representation in Canada from Statistics Canada. An alternative method may be
to provide two columns from which to select a response from each, or to ask for a written response.

Several students had difficulty understanding the response format of the PAQ. Discussions with teachers after the collection of the research packages and examination of the protocols during the data screening process, confirmed that despite a thorough explanation initially to the teachers and to the participants as a group, some students continued to have difficulty correctly completing the PAQ. The main difficulty occurred because the students may have failed to read the instructions and provide an answer for each item for each parent. Secondly, many participants mentioned to the teachers that they viewed the Combined PAQ form as a repeat of the Mother/Father form and therefore did not complete it. For the study, this resulted in several questionnaires with too much missing data to be considered for inclusion in the analysis, corresponding to decreased sample sizes and power in the analyses. It may have also reduced the range in responses and scores. In the future, it may be beneficial, especially if the PAQ is going to be used in large group administration or school screenings, to change the format of the PAQ to that of the IPPA.

Future Directions

Future directions in the research of these self-report measures should examine the construct validity of the attachment measures. Specifically, the theory of parent attachment should be used to guide researchers in revisiting the items and structure of the IPPA and PAQ. Consistent with Bowlby’s theory of attachment, it will be important to look at the development of peer attachment as a separate entity, not simply duplicating the parent items to construct a peer
attachment scale. In addition, multiple methods of assessing parent attachment would help to reduce shared method variance. Measures of separation anxiety may also be considered as part of the validity analysis, as this construct would appear, theoretically, to be the closest construct to attachment, and perhaps the most difficult test of discriminant validity.

Based on the ethological theory of attachment and research, a more thorough understanding of "peer attachment" as a construct is required. Future research would help clarify peer attachment, and whether the nature of peer bonds are confined to dialogue, not felt security as the construct of attachment is based. A further consideration is that in absence of parental attachment do peers fulfill the "attachment" role?

Bowlby (1982) would argue that for most adolescents, the parent-child bond changes as the child becomes more independent and seeks additional relationships, of more or less perceived significance than those with his/her caregiver. It would be valuable to have access to measures that yield reliable and valid scores so that longitudinal studies can be carried out to examine this possible change and the stability of parent-child attachment over time. Moreover, longitudinal data would contribute invaluable information in terms of providing a very strict test of construct validity for the self-reports against the results obtained by the Strange Situation. Research that includes time lapse, also allows for causal links to be hypothesized and tested. For example, how negative attachment types may contribute to future states of depression, anxiety, and difficulty forming and maintaining relationships. Similarly, it is also important to
examine how positive attachment to parents can reduce the impact of negative life events on a child and adolescent.

[What I had in mind when defining attachment behaviour was the output of what might be called a safety-regulating system, namely a system the activities of which tend to reduce the risk of the individual coming to harm and are experienced as causing anxiety to be allayed and a sense of security to be increased (Bowlby, 1982. p. 374).]
References


Appendix A

About You

Sex:  Male □  Female □

When you were born? Month __________ Year __________
(Example: December 1983)

Grade:  8 □
  9 □
  10 □
  11 □
  12 □

Ethnic Background: (check 2 only)

Canadian □  German □  Norwegian □
English □  Ukrainian □  Chinese □
French □  First Nations □  Swedish □
Scottish □  Dutch □  Other (please specify) □
Irish □  Polish □

About Your Mother:

When you think about your mother she is your:

□ Biological mother
□ Stepmother
□ Adopted mother
□ Foster mother
□ Other (please write in)

□ I will not be answering about my mother because I don’t have a mother.

Your mother’s education:

□ Completed 8th grade or less
□ Completed grades 9, 10, or 11
□ Graduated from high-school
□ 1 to 3 years of college/university
□ 4 or more years of college/university
**About Your Father:**

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<th>Your father's education:</th>
</tr>
</thead>
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<td>[ ] Biological father</td>
<td>[ ] Completed 8th grade or less</td>
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<tr>
<td>[ ] Stepfather</td>
<td>[ ] Completed grades 9, 10, or 11</td>
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<td>[ ] Adopted father</td>
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<td>[ ] Foster father</td>
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<td>[ ] Other (please write in)</td>
<td>[ ] 4 or more years of college/university</td>
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<tr>
<td>because I don't have a father.</td>
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</table>
Appendix B

The University of British Columbia
Department of Educational Psychology and Special Education
2125 Main Mall, Vancouver, BC V6T 1Z3
Phone: (604) 822-5263 Fax: (604) 822-3302

Informed Consent Form

Attachment the Construct: A Construct Validity Study of Parent-Adolescent Attachment Measures

Date:

Dear Parent or Guardian:

We are writing to ask permission for your son/daughter to take part in a research project that is being conducted at your child's school. The general focus of the study is to examine the relationships that children have with their parent(s)/guardian(s) as indicated by several questionnaires of parent-child attachment. This project is directed by Dr. Nand Kishor, who is professor in Educational Psychology and Special Education at the University of British Columbia, with Ms Stacey Bablitz, a graduate student at UBC also collaborating on this study as part of her masters thesis project.

Purpose:

The purpose of this study is to examine: (a) the characteristics (e.g., trust, communication, and overprotection) of the relationships that children are reporting with their parent(s)/guardian(s) and (b) the relationship between parent-child attachment and child self-concept and anxiety/fears. Several parent-child attachment questionnaires are currently being used in research to examine the relationship between parent-child attachment patterns and the number and type of peer relations that children develop. However, there have been few studies that have examined whether these measures of parent-child attachment are good measures of the parent-child relationship. The current study will report on what the parent-child attachment questionnaires are measuring and how well they explain the relationship between a parent(s) and child.

What is involved?

We plan on assessing students in grades 10 through 12 in the school. Students who are participating in the study will be asked to fill out a set of questionnaires that will take about 60 minutes to complete in the classroom during class time for credit. All of the questionnaires have previously been used in research or general use with children in school settings and there have been no known ill effects from answering the questions. The questionnaires will examine how your son/daughter describes the relationships that he/she has with you (e.g., trust and communication). In addition, several questionnaires will inquire about your child's self-concept and anxiety/fears. Most children enjoy filling out the questionnaires and find the questions interesting. Students who do not wish to participate will be doing class work.
Please complete the section below the dotted line and return the form to school with your child. Keep the top section for your records. Thank you.

Consent:

I understand that my child's participation in this study is entirely voluntary and that I as well as my child may refuse to participate or withdraw from the study at any time without jeopardy.

I have received a copy of this consent form for my own records.

I give consent/I do not give consent (please circle one) for my son or daughter to participate in this study.

I would like more information before giving my permission for my child to participate in this study. Please call me at ____________________.

Parent or Guardian's Name_____________________________(please print)

Parent or Guardian's Signature_________________________Date__________________

Son or Daughter's Name______________________________(please print)

Please send this form back to school with your son or daughter within the next three days to qualify for a draw for gift certificates to a music store. Thank you!
Appendix C

Teacher Protocol for the Study:

Attachment the Construct: A Construct Validity Study of Parent-Adolescent Attachment Measures

(After the students have each received a copy of the research package, please instruct them as follows:)

Each of you has received a copy of the questionnaire package to be completed for the study. I will first read you your rights as participants and then a brief description of the study. Please follow along by reading the first page of your packages and wait until I have finished reading the instructions before you complete the questions.

On the first page you will print your name and read through all of the directions. Before you turn the page and begin answering the questionnaires, please tear off the top page and leave it on your desk. I will pick them up and seal them in an envelope. As a gesture of appreciation for your help in this project, each of you participating will be entered into a draw for gift certificates from a music store. The top page with your name on it will serve as your entry form and allow Ms Bablitz to ensure that each of you have a matching permission form from your parents. Please do not put your name or identifying information on any other pages.

As participants, you understand that your parents have given permission for you to take part in this study. Your participation in this study is also entirely voluntary. If you refuse to participate your school grades will not be affected. Your completion of the questionnaires indicates that you are giving your permission to take part in this study.

The title of the research project is:

Attachment the Construct: A Construct Validity Study of Parent-Adolescent Attachment Measures

This project is being carried out by Dr. Nand Kishor, who is professor in Educational Psychology and Special Education at the University of British Columbia, with Ms Stacey Bablitz, a graduate student at UBC. The focus of the study is to examine the relationships that teenagers have with their parent(s)/guardian(s). The current study will help to explain the relationship between a parent and a teenager, and will help to determine if the questionnaires are good measures of the parent-child relationship.

This is a chance for you to describe your relationships with your family and friends, your feelings, and how you feel about yourself. THIS IS NOT A
TEST. There are no right or wrong answers and everyone will have different answers. Be sure that your answers show how you feel. Please do not talk about your answers with anyone else while completing the questionnaires. To help keep your answers private do not put your name on any other pages, and keep your answers private by not showing them to anyone. Only the researchers will see the questionnaires.

It should take you about 1 hour to finish answering all of the questions. Each questionnaire will have its own set of directions. Please read the directions first to make sure that you are answering the questions correctly. Also, please look on both sides of each piece of paper to ensure that you complete all of the questions even if you think you answered them on a previous page. If you have any questions or you do not understand what a question means, please ask your teacher or Ms Bablitz for help. They will be happy to explain it to you.

After you have completed all of the questions, please seal your questionnaires in the envelope provided. Return the package of questionnaires to your teacher when you have finished.

Thank you for your participation. You may begin.
Introduction and Directions

Please print your name and read through all of the directions on this page. Before you turn the page and begin answering the questionnaires, please tear off this top page and leave it on your desk to be picked up by your teacher or Ms Bablitz. Please do not put your name or identifying information on any other pages.

Student Name: ___________________________(please print) I.D.: __________

I understand that my parents have given permission for me to take part in this study. I also understand that my participation in this study is entirely voluntary. If I refuse to participate my school grades will not be affected.

Your completion of the questionnaires indicates that you are giving your permission to participate in this study.

The title of this research project is:

Attachment the Construct: A Construct Validity Study of Parent-Adolescent Attachment Measures

This project is being carried out by Dr. Nand Kishor, who is professor in Educational Psychology and Special Education at the University of British Columbia, with Ms Stacey Bablitz, a graduate student at UBC. The focus of the study is to examine the relationships that teenagers have with their parent(s)/guardian(s). The current study will help to explain the relationship between a parent and a teenager and will help to determine if the questionnaires are good measures of the parent-child relationship.

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It should take you about 1 hour to finish answering all of the questions. Each questionnaire will have its own set of directions. Please read the directions first to make sure that you are answering the questions correctly. If you have any questions or you do not understand what a question means, please ask your teacher or Ms Bablitz for help. They will be happy to explain it to you.

Return the package of questionnaires to your teacher or Ms Bablitz when you have finished.

Thank you for your participation.
### Appendix E

**Descriptive Statistics of Each Measure and Subscale for the Entire Sample**

<table>
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<th>Measure</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<td></td>
<td>10-45</td>
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<td>14.01</td>
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Appendix F

Lisrel Syntax

Confirmatory Factor Analysis Syntax
IPPA Mother Factor Analysis - 25 items and 3 latent constructs/subscales
DA NI=25 NO=200 MA=CM
LA
ITEM1 ITEM2 ITEM3 ITEM4 ITEM5 ITEM6 ITEM7 ITEM8 ITEM9 ITEM10
ITEM11 ITEM12
ITEM13 ITEM14 ITEM15 ITEM16 ITEM17 ITEM18 ITEM19 ITEM20 ITEM21
ITEM22 ITEM23
ITEM24 ITEM25
CM FI=IPPAMCOV
MO NX=25 NK=3
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TRUST COMMU ALIENTN
PA LX
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Appendix G

Lisrel Syntax

Invariance Testing Syntax
H1: Same number and form - FEMALES
DA NG=2 NI=54 NO=122
LA
ITEM1 ITEM2 ITEM3 ITEM4 ITEM5 ITEM6 ITEM7 ITEM8 ITEM9 ITEM10
ITEM11 ITEM12
ITEM13 ITEM14 ITEM15 ITEM16 ITEM17 ITEM18 ITEM19 ITEM20 ITEM21
ITEM22 ITEM23
ITEM24 ITEM25 ITEM26 ITEM27 ITEM28 ITEM29 ITEM30 ITEM31 ITEM32
ITEM33 ITEM34
ITEM35 ITEM36 ITEM37 ITEM38 ITEM39 ITEM40 ITEM41 ITEM42 ITEM43
ITEM44 ITEM46
ITEM47 ITEM48 ITEM49 ITEM50 ITEM51 ITEM52 ITEM53 ITEM54 ITEM55
CM FI=PAQFFCOV
MO NX=54 NK=3 TD=SY
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(311)
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DA NO=55
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ITEM11 ITEM12
ITEM13 ITEM14 ITEM15 ITEM16 ITEM17 ITEM18 ITEM19 ITEM20 ITEM21
ITEM22 ITEM23
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Endnotes

1 In the literature the insecure categories are often prefaced with "anxious" as in anxious-avoidant (Crittenden, Partridge, & Claussen, 1991) or with "insecure" as in insecure-ambivalent (DeMulder & Radke-Yarrow, 1991).

2 Cohen's Kappa coefficient is more robust because it calculates percentage of agreement while also taking into account the probability of agreement that is due to chance.

3 The reader is cautioned when reading the article by DeMulder and Radke-Yarrow (1991) because the authors make several implications based on results that are not statistically significant.

4 According to Cohen and Cohen (1983, p. 515) this coefficient provides an alternative to chi-square analysis when examining the correlations of co-occurrence of scores in categories from nominal scales.

5 Also called the hostile-dependent type in the literature.

6 Berman, Heiss, and Sperling (1994) have reported mixed results on a similarly aged sample. However, the current author suggests that this is likely due to the reported low validity of the six-item attachment measure used in the study.