

Development and Psychometric Properties of a New Self-Report Questionnaire Measuring Attachment in School-Age Children: The Attachment in Middle Childhood Questionnaire (AMCQ)

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Abstract

Although conscious aspects of attachment representations can be effectively assessed in middle childhood, the few available self-reports are based on different operationalizations of attachment and do not always show adequate psychometric properties. The current study aimed to develop and evaluate the psychometric properties of the Attachment in Middle Childhood Questionnaire (AMCQ). Using three independent samples of Italian children ($M_{\text{age}} = 10$ years, 52% = girls), in three interrelated studies we (1) selected a pool of items from existing questionnaires, adapted them to the same response format, and subjected them to exploratory factor analysis; (2) performed confirmatory factor analyses on the retained items; and (3) used structural equation modeling to assess the factor structure, external validity, and invariance across gender and age groups. The final 15-item questionnaire comprised two dimensions (anxiety and avoidance) and a supplementary scale (security). Overall, results supported the reliability and validity of the AMCQ for Italian children.

Keywords

Attachment in Middle Childhood Questionnaire, psychometric properties, invariance, middle childhood

The quality of attachment relationships plays a key role in infants' social and emotional adjustment (Boldt et al., 2016; Booth-LaForce et al., 2014; Groh et al., 2012; Groh et al., 2014). Insecure attachment represents a vulnerability factor for the development of a number of health problems in adolescence and adulthood (Cassidy & Shaver, 2016). In contrast, secure attachment is protective for young children's social-emotional development, and its significance for adaptation is well documented also in middle childhood and adolescence (Kerns & Brumariu, 2016; Madigan et al., 2016; Moss & Lecompte, 2015). Indeed, early attachment experiences give rise to mental representations—including memories, thoughts, expectations, and emotions related to the self and others, called internal working models (Bowlby, 1973). These models represent “a set of conscious and/or unconscious rules for the organization of information relevant to attachment, and for obtaining and limiting access to that information” (Main et al., 1985, p. 66).

Individual differences in attachment largely reflect the quality of children's caregiving environment and are related to different behavioral outcomes. Securely attached children experience caregivers who are capable of responding

adequately to their proximity requests and show the characteristics of accessibility and responsiveness that fall into the category of “availability” (Bowlby, 1973). They engage in high levels of exploration, are self-confident, and use their mother as a secure base for exploring the world and as a safe haven when they are anxious or distressed. Children with an avoidant attachment show less effective engagement with the caregiver and avoid seeking care and support from him or her to cope with stressful events due to a lack of responsiveness and availability (Ainsworth et al., 1978). Anxious/ambivalent children make experience of inconsistency in the primary caregiver's behavior. They appear to

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engage less in environmental exploration and express hypervigilance and anger, while showing inconsistent attempts to obtain support and be comforted by the caregiver. Finally, children develop a disorganized attachment when the primary caregiver, who is supposed to provide care and comfort in case of distress, is perceived by the child as a source of fear.

Compared with other developmental phases, middle childhood has received relatively less attention partly due to the challenges inherent in measuring attachment beyond infancy (Bosmans & Kerns, 2015; Raikes & Thompson, 2005). In this crucial developmental period encompassing the ages of 7/8 to 11/12 years, the considerable strides in abstract thinking and cognitive flexibility lead to an increase in the ability to understand and manage feelings, internal states, and manifest behaviors (Raikes & Thompson, 2005). Furthermore, the full development of a theory of mind, together with the improvement of metacognitive skills, allows children to begin to understand different points of view (Raikes & Thompson, 2005). Children spend more time away from their family, multiple figures (e.g., friends, teachers) become increasingly relevant, and children show more independence and self-awareness (Kerns & Brumariu, 2016). Taken together, these changes contribute to rendering attachment representations more elaborate and organized (Kerns & Brumariu, 2016); the attachment system is tested by longer separations, and psychological availability of the primary caregiver overcomes physical proximity (Kerns et al., 2006).

In terms of measurement, one of main consequences is that the well-validated assessment procedure of attachment based on multiple separations and reunions (i.e., Strange Situation Procedure; Ainsworth et al., 1978) may not be effective for school-age children (Ainsworth, 1990; Lewis et al., 2000; Stevenson-Hinde & Shouldice, 1995). Also, semistructured interviews that are often used to assess attachment representations in adults (e.g., Adult Attachment Interview; George et al., 1985) may be problematic for the majority of young children, because formal operational reasoning is still underdeveloped (Crowell et al., 1999). In this context, questionnaires represent a valid alternative option and thus have been frequently adopted in recent years to investigate attachment relationships in middle childhood (Brenning et al., 2011; Dwyer, 2005; Kerns et al., 2005). However, the availability of well-validated and psychometrically sound instruments is still limited (Brenning et al., 2011; Kerns et al., 2005).

Based on these considerations, the aim of this study is to propose an age-appropriate, comprehensive, and efficient tool—the Attachment in Middle Childhood Questionnaire (AMCQ)—to assess the quality of child–mother and child–father relationships in middle childhood. Specifically, across three interrelated studies and using three independent samples of Italian school age children, we describe the

development and psychometric properties of the instrument in terms of factor structure and external validity. Given the crucial role of the quality of attachment relationships in this particular developmental period, the availability of an easily administrable and psychometrically robust measure to assess and monitor attachment representations in middle childhood is paramount to inform both theory and practice.

Measuring Attachment in Middle Childhood

Over the past 20 years, the growing interest in attachment representations in middle childhood has stimulated the development of several instruments relying on different theoretical and methodological approaches, such as semistructured interviews, projective techniques, and self-report questionnaires (Bosmans & Kerns, 2015; Jewell et al., 2019). The latter have been recognized as useful tools to assess attachment in middle childhood (Bosmans & Kerns, 2015; Main, 1999), and have been widely applied in research with children and adolescents. Bosmans and Kerns (2015) advocated the usefulness of a self-report measurement approach, stating that it is complementary to other approaches (i.e., interviews). Given that during middle childhood children are able to understand and manage their own feelings, internal states, and manifest behaviors, self-report questionnaires are deemed to be a valid tool to capture the consciously accessible aspects of attachment organization. Furthermore, Chartrand and Bargh (2002) argued that “conscious and unconscious processes typically operate in the same direction to achieve a goal, and unconscious motives are often manifested in conscious appraisals” (Mikulincer & Shaver, 2007, p. 109). Despite their widespread use in both developmental and clinical research, however, information concerning the psychometric properties of existing attachment questionnaires is extremely limited, and sometimes such properties have been found to be inadequate (see Jewell et al., 2019).

Briefly, four questionnaires are currently available to measure attachment representations in children aged between 8 and 12 years. The Security Scale (SS; Kerns et al., 2001) and the Preoccupied and Avoidant Coping Questionnaire (PACQ; Finnegan et al., 1996) were specifically developed for middle childhood, whereas the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) and the Experiences in Close Relationships–Revised Child version (ECR-RC; Brenning et al., 2014) were recently adapted for use with children from the original questionnaires, which were devised for late adolescents and adults, respectively. Among other aspects, these questionnaires differ in how attachment is operationalized: The SS and the IPPA provide a broad assessment of the child’s attachment in terms of security, whereas the ECR-RC and the PACQ measure specific insecurity dimensions—namely anxiety/preoccupation and avoidance.

The 15-item SS is the most widely used self-report questionnaire assessing security versus insecurity toward mother and father in children aged between 8 and 12 years (Bosmans & Kerns, 2015). A recent meta-analysis of 57 studies provided evidence for cross-cultural, convergent, and concurrent validity of the SS (Brumariu et al., 2018; Van Ryzin & Leve, 2012), as well as for structural invariance across parents (Bacro, 2011; Fernandes et al., 2021; Marci et al., 2018a). However, it does not allow to directly measure insecurity (i.e., anxiety and avoidance), which has been shown to contribute to a number of maladjustment outcomes in both infancy and middle childhood (Cassidy & Shaver, 2016; Groh et al., 2012).

With regard to the PACQ, data concerning its psychometric properties are still scarce and limited to three studies (see Finnegan et al., 1996; Marci et al., 2019a; Younger et al., 2005). It includes 20 items assessing anxiety/preoccupation and avoidance toward mother and father during middle childhood. Negative intercorrelations between the two subscales were reported for both mother- and father-related items ($r = -.30$ and $-.22$, respectively; Kerns et al., 2000). Overall, results supported good psychometric properties in terms of factorial and external validity, even though in the Italian version, some items showed relatively low factor loadings and high modification indexes and were thus removed (see Marci et al., 2019b). Furthermore, invariance across boys and girls was established in Italian children (Marci et al., 2019b), but empirical evidence for invariance of PACQ scores between mother and father forms is not yet available.

The IPPA is the most commonly used assessment tool in adolescence, whereas its use with children aged between 8 and 10 years is extremely limited. It consists of 28 items assessing parental attachment in terms of trust, communication, and feelings of alienation. Only one study tested its psychometric properties in middle childhood (IPPA-R; Gullone & Robinson, 2005), providing initial support for its factorial validity and external validity in Australian children and early adolescents aged between 9 and 15 years.

The ECR-RC was adapted for use with children and adolescents (Brenning et al., 2011; 2014) from the original ECR, which was developed to assess romantic attachment in adults (Fraley et al., 2000). A long version including all the 36 items of the original ECR (Brenning et al., 2011) and a short 12-item version (Brenning et al., 2014) are currently available. Studies found moderate to strong positive intercorrelations between the anxiety and avoidance dimensions for both mother-child ($r = .52-.70$; see Brenning et al., 2014; Skoczeń et al., 2019), and father-child attachment ($r = .61-.65$; see Brenning et al., 2014; Skoczeń, et al, 2019). The ECR-RC has shown good psychometric properties in terms of factor structure and external validity in different countries including Belgium, Italy, and Poland (Brenning et al., 2011; Brenning et al., 2014; Lionetti et al., 2018;

Marci et al., 2018b; Skoczeń et al., 2019); moreover, invariance was established across gender and age groups (8-10 years vs. 11-13 years) and across parents, suggesting that the instrument assesses attachment representations toward mother and father in the same way (Lionetti et al., 2018).

Concerning the association among questionnaires, Brenning et al. (2011) reported negative correlations between the SS and the ERC-RC anxiety and avoidance scores ($r = -.67$ and $r = -.70$, respectively). Similar values were found for Italian children and adolescents (see Marci et al., 2018b). Some studies also recorded a negative association between the SS felt security score and the PACQ avoidance subscale, and an unexpected positive association between security and the PACQ preoccupied subscale (Kerns et al., 2000; Marci et al., 2018a). Albeit counterintuitive, the latter finding might be explained in light of the characteristics of attachment relationships in middle childhood, which are marked by the coexistence of a medium degree of security and a certain level of dependency on the parent (Hodges et al., 1999).

While previous research found moderate to high positive associations between the avoidance subscales of the PACQ and the ECR-RC, no associations emerged between the preoccupied and anxious subscales of these questionnaires (Brenning et al., 2011; Marci et al., 2019a), suggesting that the two subscales might reflect different aspects of insecurity.

In the past two decades, several scholars have raised concerns about the ability of extant attachment questionnaires to tackle the security region when using the two insecurity dimensions (e.g., Fraley et al., 2000). For instance, Younger et al. (2005) questioned the ability of the two PACQ dimensions to capture all the variance associated with felt security in middle childhood. Hence, the authors proposed a new version of the PACQ, which included an additional subscale for secure attachment comprising 10 of the 15 items derived from the SS (Kerns et al., 2001). However, this new measure encompassed 30 items, therefore potentially leading to participant fatigue (especially among younger children) which may negatively impact on data reliability and validity. A subsequent study by Brenning et al. (2017) tested the incremental value of assessing security via the SS in addition to anxiety and avoidance measured via the 36-item version of the ECR-RC. The results suggested that the combined use of the two questionnaires did not provide an additional contribution to the assessment of children's attachment, but the blended use of the two instruments resulted in a lack of parsimony due to the overlapping content of several items, which might have influenced the reliability of results.

More recently, studies using the ECR-RC have highlighted the presence of a third factor mirroring security (Lionetti et al., 2018; Skoczeń et al., 2019). In particular, the security factor comprised three of the six items

originally pertaining to the avoidance subscale of the short ECR-RC (Lionetti et al., 2018), and 12 of the 36 items of the long ECR-RC (Skoczeń, et al., 2019). However, both solutions were not thrifty in terms of the number of items included in each subscale, and neither study tested the external validity of this factorial solution. Furthermore, both studies were based on adolescent samples, leaving the question open of whether the findings are generalizable to younger children.

Overall, the extent to which the construct of attachment in middle childhood is better represented by two or three dimensions is still under debate, and extremely little research has addressed this issue. From a theoretical and clinical perspective, identifying the latent structure of attachment in this relatively neglected developmental period is essential in light of recent developmental approaches suggesting that low levels of insecurity do not necessarily correspond to high levels of security, and vice versa (see, e.g., the positive psychology approach and the notion of flourishing introduced by Seligman, 2011, or the vantage sensitivity concept proposed by Pluess & Belsky, 2013). Hence, our study set out to shed light on this issue by capitalizing on extant measures to develop a questionnaire that adequately reflected the characteristics of attachment (in)security in middle childhood.

With regard to instrument design, and particularly item response format, questionnaires specifically designed for children follow the “some/other” format (Harter, 2012), whereas those initially developed for other developmental periods (i.e., adolescence and adulthood) follow the Likert-type format, which is in line with the original instruments. Harter’s response format, also known as the “some/other” format (Harter, 1982), has been designed to offset children’s tendency to give socially desirable responses. This format requires children to read two opposing statements, such as “Some kids worry that their mom does not really love them BUT Other kids are really sure that their mom loves them” (Kerns et al., 1996). After choosing the child that best fits them, participants are asked to indicate whether the description is “really true” or “sort of true” for them. Although this response format requires more time to explain children how it works and involves more cognitive load, responding to Harter’s format—which basically consists of two dichotomous questions—may facilitate the answer process in younger children, who are more inclined to think in a dichotomous way (Gelman & Baillargeon, 1983). Also, the absence of double negatives (i.e., negatively worded questions associated with a negative response, such as “false” or “not like me”) makes it easier for younger children to understand and respond. Furthermore, Harter (1982) argues that administration time and cognitive burden involved in this type of answer format are likely offset by the advantage to elicit more accurate self-descriptions and less socially desirable responses.

The choice of an age-appropriate response format is critical to obtain reliable and valid data, but surprisingly little attention has been devoted to such aspects. Indeed, despite the cognitive advancements occurring in middle childhood, many children still have difficulties with logical forms of sentences, and especially younger children are less able to respond to negatively worded items (Borgers et al., 2000; Marsh, 1986). On the contrary, Harter-type questions might be particularly suitable for younger children due to the absence of potential double negatives, which can adversely impact children’s comprehension of questions and therefore undermine reliability of the questionnaire (Marci et al., 2019b).

Overview of Current Study

To address the issues reported above, the current study aimed to propose an age-appropriate, comprehensive, and efficient tool—the AMCQ—to assess the quality of child–mother and child–father relationships in middle childhood. In doing so, we built on the SS and ERC-RC due to their well-established psychometric properties, including convergent and concurrent validity as well as invariance across maternal and paternal forms (Brumariu et al., 2018; Fernandes et al., 2021; Lionetti et al., 2018; Marci et al., 2018a, 2018b; Skoczeń et al., 2019). Overall, the study was developed in three subsequent phases: (1) the preliminary phase, labeled Study 1; (2) the refinement phase, that is, Study 2; and (3) the testing phase, which is described as Study 3.

In Study 1 (i.e., preliminary phase), 30 items from existing questionnaires (12 from the SS and 18 from the ECR-RC) were retained in an initial pool (see Study 1, for more details) and adapted using the same response format (i.e., “same/other” response type). Given that invariance across mother- and father-related items included within the SS and the ECR-RC had already been established in previous research (see Brenning et al., 2014; Lionetti et al., 2018; Marci et al., 2018b), we considered only the mother-related items. On these items, we performed an exploratory factor analysis (EFA) and extracted 21 elements spaced out over three factors.

In Study 2 (i.e., refinement phase), using a semiconfirmatory approach, we selected a final pool of 15 items by performing a series of confirmatory factor analyses (CFAs) on the mother-related items. In particular, the selection of items was based on a step-by-step procedure in which items were selected based on factor loadings on their respective factors and weak cross-loadings. Then, a CFA was performed on the father-related items.

In Study 3 (testing phase), we defined and evaluated the resulting factor structures in a large sample of children considering both mother- and father-related items. First, we performed a CFA on the two- and three-factor models and,

focusing on the conceptual question of whether the third security factor in association with the two insecurity dimensions (i.e., anxiety and avoidance) may better explain attachment representations during middle childhood (see Fraley et al., 2000; Lionetti et al., 2018; Younger et al., 2005), we compared fit indexes of the two- and three-factor models. Consistent with previous research testing the factor structure of the ECR-RC in children and adolescents (see Brenning et al., 2014; Marci et al., 2018b; Skoczeń et al., 2019) and the results of studies using the ECR and the ECR-R with adults (see Cameron et al., 2012, for an overview), we expected to find a medium-to-high positive correlation between the anxiety and avoidance dimensions. Furthermore, we anticipated to find a negative association between both insecurity dimensions and the security factor.

Next, we tested concurrent validity between the two models with external variables, namely global self-worth and social support from family and friends. Briefly, the two-dimensional model assumed that attachment is well assessed by two separate factors, namely anxiety and avoidance, whereas the second model included the third felt security factor and assumed a consistent improvement in the assessment of attachment in middle childhood.

The external measures have been selected because they were previously used to test external validity of attachment questionnaires, and/or are regular entrants in studies aiming to understand children's attachment representations and related outcomes. In particular, research so far has reported that secure attachment in children is associated with higher levels of self-worth and greater perceived social support (Anan & Barnett, 1999; Ryan & Lynch, 1989; Waters & Waters, 2006).

In the current study, we anticipated to replicate the findings reported above as evidence for external validity of the new instrument as well as for appropriateness of the three-factor model (i.e., anxiety, avoidance, and felt security) in explaining the external variables compared with the two-factor model (i.e., anxiety and avoidance). Specifically, based on extant theory (see Cassidy, 1990), we expected the avoidant and anxious attachment scores to be negatively related to children's self-worth, and the security score to be positively associated with levels of self-worth. Furthermore, we anticipated that the perception of social support would be negatively linked to both the anxious and avoidant subscales, and positively related to the felt security subscale.

After establishing the structure of the tool considering both mother- and father related items, we tested factorial invariance across age groups and gender via multigroup CFAs, and assessed its convergent validity with the ECR-RC (from which the AMCQ was partially derived). We expected to find a positive correlation between anxiety and avoidance as assessed via the new self-report and the conceptually corresponding dimensions of the ECR-RC, and a

negative correlation between felt security and the insecurity dimensions of the ECR-RC.

All analyses across studies were carried out with R statistical software (R Development Core Team, 2019). In particular, EFAs were performed using the PSYCH package (Revelle, 2019) whereas CFAs were conducted with *lavaan* package (Rosseel, 2012).

Study 1: Preliminary phase

Study 1 aimed to select a pool of items from two existing questionnaires—the SS and the ECR-RC—by extracting three factors to capture the three attachment dimensions of anxiety, avoidance, and felt security. Following previous research (Fraley et al., 2000; Lionetti et al., 2018; Younger et al., 2005), we performed an EFA by considering one- to three-factor solutions, and reasoned that seven items per dimension would be an appropriate choice, also in view of a possible further reduction of items in the subsequent step (Study 2).

Method

Participants. The study was introduced to 133 families of children aged between 8 and 10 years, who were recruited in primary schools in Northeast Italy. Written informed consent was obtained from 119 families (89%), of whom all children agreed to take part in the study. Two children were absent on the day of data collection, and children with intellectual disabilities or developmental disorders were excluded from data analyses ($n = 6$).

Hence, the final sample comprised 111 children (55% girls, $M_{age} = 8.93$ years, $SD = 0.57$, range = 7.92-9.92 years) who spoke Italian as their native language. Most children belonged to high- (73.7%) or medium-income (24.4%) families as reflected in their responses to the Family Affluence Scale (FAS; Currie et al., 2008), which is described below.

Procedure

Design. Fifty-one items included within the SS and the long version of the ECR-RC were evaluated by three of the authors (TM, AS, FL), of whom one (AS) is a licensed psychotherapist with an extensive expertise in the attachment field, and another is a senior researcher in this area (FL).

Items were scrutinized for content and sentence formulation (e.g., unambiguous wording), and were subsequently selected based on their appropriateness in capturing one of the three dimensions (i.e., security, anxiety, and avoidance) also by taking the results of previous work on the factor structure of the two instruments into account (Brenning et al., 2011; Brenning et al., 2014; Marci et al., 2018a, 2018b; Skoczeń et al., 2019).

After extensive discussion, 12 items from the SS and 18 items from the long ECR-RC (nine from the anxiety, nine from the avoidance dimension) were selected. Consistent with the original instruments, the anxiety dimension assessed concerns about social support and fear of abandonment and rejection, whereas the avoidance dimension measured discomfort with closeness. The security factor reflected the degree to which a child feels that an attachment figure is responsive and available, his or her tendency to rely on this figure in times of stress, and the child's ease in communicating with this figure (Kerns et al., 2001).

The "Some/Other" format (Harter, 1982) used in the SS was chosen as a response format for the new questionnaire. It was introduced by Harter (1982) to limit socially desirable responses and has shown good psychometric properties across attachment questionnaires (Marci et al., 2019b). Thus, the original Likert-type items of the ECR-RC were changed into Harter's response type. Of note, twelve items had been adapted by Marci et al. (2019b) in a previous study; following the same procedure, we adapted the rest of the items.

Data Collection. The project was approved by the Ethics Committee of the School of Psychology at the University of [Padova] (protocol #1838-2016).

After obtaining approval from the school principal, a letter was sent to children's parents to explain the nature and purpose of the study. All children who provided both parents' consent were involved in the study, and verbal assent was obtained from each child before data collection took place. Children were informed that they were free to end their participation at any time without any consequences, and that their participation would remain confidential. Participants completed a sociodemographic form and the pool of attachment items toward the mother. Questionnaires were administered collectively during school hours in a single session under the supervision of a trained researcher and in the presence of the teacher. Consistent with previous studies and existing recommendations (e.g., Danielson & Phelps, 2003; Harter, 2012), all items were read aloud by the researcher to reduce possible cognitive overload as well as the potential effect of differences in reading ability. Albeit not mandatory, this procedure is especially recommended for questionnaires using Harter's response format (see Harter, 2012), which entails a slightly increased cognitive burden due to the two-step choice (i.e., "some kids . . . but other kids," followed by "sort of true for me" vs. "really true for me"). It allows to reduce the amount of missing data and therefore increases the reliability of results. After the session, participants were given a certificate and were thanked for taking part in the study.

Measures

Attachment Questionnaire. The questionnaire included 30 items (the same for mother and father); of these, 12 items

originated from the SS (Kerns et al., 2001), and 18 were selected from the long ECR-RC (Brenning et al., 2011) and adapted from the original Likert to Harter's response format. For the purposes of this study, we used the Italian version of the SS (Marci et al., 2018b). With regard to the ERC-RC, 12 of the selected items are also part of the short ERC-RC, which has been previously validated for the Italian population (Marci et al., 2018b). Both Italian versions demonstrated good psychometric properties in terms of factor structure, convergent and concurrent validity, and measurement invariance across mother and father (Marci et al., 2018b; 2019). The remaining six items from the long ECR-RC were translated in Italian language using standard translation-backtranslation techniques. In the newly developed questionnaire, each item was rated using the "some/other format" and is scored on a 4-point scale (Kerns et al., 2001). Children received instructions as described in Marci et al. (2019b).

Socioeconomic Status. Children completed a brief sociodemographic form asking about their age, gender, and place of birth, together with the Italian version of the FAS (Currie et al., 2008), a four-item measure of family wealth. Scores across items are summed to provide an overall score ranging from 0 to 9, in which scores from 0 to 2 denote low affluence, 3 to 5 medium affluence, and 6 to 9 high affluence. The FAS provided evidence of validity and reliability across different countries, including Italy (Vieno et al., 2009).

Data Analysis

At the descriptive level, item response distributions and the main descriptive statistics (i.e., mean, standard deviation, and skewness) were evaluated.

Then, an EFA was performed using the polychoric correlation matrix, since items were measured on an ordinal scale (Rhemtulla et al., 2012). Based on previous research showing that anxiety and avoidance are not orthogonal in middle childhood and adolescence (e.g., Brenning et al., 2011; Lionetti et al., 2018; Skoczeń et al., 2019), and due to the intercorrelations between insecurity dimensions (i.e., anxiety and avoidance) as well as between insecurity dimensions and felt security observed in previous studies (Brenning et al., 2011; Kirimer et al., 2014; Marci et al., 2018b), we used Oblimin as the rotation criterion, which allows factors to be correlated. Based on the extant literature and the measures from which the items were taken (Brenning et al., 2014; Fraley et al., 2000; Lionetti et al., 2018; Younger et al., 2005), we considered one- to three-factor solutions. The most plausible model was selected following several criteria. First, we adopted a model comparison perspective using the Bayesian information criterion (BIC), where lower values of BIC indicate a better fit

(Raftery, 1995). Then, we evaluated the variance explained by the best fitting model to ensure that it reached a reasonable level (i.e., at least 40%). After selecting the most plausible model, we examined the meaning of each factor and closely inspected the factor loadings as well as the content of the 30 items. Even though our goal was to yield a 15-item tool, given the exploratory nature of this first study as well as the limited sample size, we adopted a “conservative” approach and decided a priori to keep two more items (i.e., seven items for each dimension), also in view of a further reduction planned in Study 2. As part of the selection criteria, items were allocated to the factor for which they demonstrated strong primary loadings (.40) and very weak secondary loadings (.20; Comrey & Lee, 1992).

Results

Item response distributions and the main descriptive statistics (i.e., mean, standard deviation, and skewness) for each item are provided in the supplementary material section, available online (Table S1). Overall, items selected from the ECR-RC showed a right-skewed distribution, whereas items from the SS exhibited a left-skewed distribution.

An EFA was performed on the mother form. Inspection of the BIC values of the three estimated models ($BIC_{\text{one factor}} = 3639$, $BIC_{\text{two-factors}} = 3516$, and $BIC_{\text{three factors}} = 3513$) indicated that the two- and three-factor solutions were slightly better than the one factor solution, and were substantially equally plausible (see Raftery, 1995). Indeed, both solutions reflected a good compromise between complexity (i.e., number of parameters) and explained variance. However, we chose to retain the three-factor solution as a starting point for further evaluation in Study 2, because it was consistent with recent theoretical concerns about the ability of extant measures of attachment insecurity to appropriately tackle the security region in middle childhood (Younger et al., 2005). The three-factor solution explained a satisfactory proportion of variance (46%), with the first, second, and third factors explaining 22%, 13%, and 11% of the variance, respectively. The three extracted factors were labeled avoidance, anxiety, and felt security based on their respective item content. While the anxiety factor was strongly linked to its associated observed items, the avoidance and security factors were characterized by the presence of some items with several cross-loadings and/or low primary loadings. Thus, in the anxiety subscale, we included seven items with heavy primary loadings ($>.40$) and very weak secondary loadings ($<.20$). Of these, only five items satisfied the established criterion for item selection (i.e., primary loadings $>.40$, secondary loadings $<.20$) with regard to the avoidance and security dimensions. We nonetheless retained the remaining two items for each dimension based on their content, since they reflected children’s perception of the attachment figure as responsive, available,

and supportive in times of stress (security factor) or as avoidant of closeness (avoidance factor). The final 21 items are highlighted in bold in Table S2 (see supplementary materials, available online). Moreover, factor loadings and factor intercorrelations are available online within the supplementary materials (see pp. 3-4).

Study 2: Refinement Phase

The second study aimed to reduce the number of items from 21 to 15, with 5 items for each attachment dimension (i.e., anxiety, avoidance, and felt security). Indeed, our goal was to yield a number of items able to ensure good levels of reliability while at the same time resulting in a parsimonious, easy-to-administer measure. Furthermore, since one of our main purposes was to evaluate whether attachment in middle childhood was better represented by a 2- or a 3-dimensional model, we tested the factorial validity of both a reduced two-factor solution (with only anxiety and avoidance items) and the three-factor solution (anxiety, avoidance, and felt security items).

Method

Participants. The study was introduced to 271 families of children aged between 8 and 12 years, who were attending public primary and middle schools in Northeast Italy. Written informed consent was obtained from 259 families (95% of the total sample), but 20 children were absent on the day of data collection. Also, children with intellectual disabilities or who had certificated developmental or learning disorders ($n = 8$) or with more than 20% of missing data ($n = 8$) were excluded from subsequent analyses. The remaining missing data ($<1\%$) were handled with the pairwise maximum likelihood (PML) estimation method, which is suitable for factor-analytic models with ordinal data. Hence, the final sample comprised 223 children (51.6% girls; $M_{\text{age}} = 10.5$ years, $SD = 1.2$, range = 8-12.6 years) who spoke Italian as their native language. Of these, 12 completed only the questionnaire concerning the mother, but they were nonetheless retained. Most children belonged to high- (84.8%) or medium-income (15.7%) families, as reflected by FAS responses (Currie et al., 2008; see Measures section of Study 1, for more details).

Procedure

We used the same procedure as the one described in Study 1.

Data Analysis

First, we calculated item response distributions separately for mother- and father-related items and computed the main

Table 1. Fit Indices for the Confirmatory Factorial Models (Two and Three factors) of the AMCQ (Study 2).

	$\chi^2_{\text{scaled}}/df$	CFI _{scaled}	TLI _{scaled}	RMSEA _{scaled} [90% CI]	SRMR
<i>Mother</i>					
M2.1: Two-factor	0.963	1.000	1.002	.000 [.000, .046]	.046
M2.2: Three-factor	1.339	0.980	0.976	.039 [.017, .057]	.058
<i>Father</i>					
M2.3: Two-factor	1.388	0.995	0.993	.043 [.000, .070]	.046
M2.4: Three-factor	1.542	0.989	0.986	.051 [.033, .067]	.042

Note. $N = 223$. Two-factor model: anxiety, avoidance; three-factor model: anxiety, avoidance, and felt security. AMCQ = Attachment in Middle Childhood Questionnaire; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual.

descriptive statistics (i.e., mean, standard deviation, and skewness) for both mother and father items.

To obtain a 15-item scale, a series of CFAs was first conducted on the mother form. Specifically, a CFA was run on the whole pool of items loading onto the hypothesized three latent factors (i.e., anxiety, avoidance, and security). After inspecting the factor loadings and the MI, we removed those items that showed low factor loadings and high cross-loadings on a step-by-step basis. This procedure yielded a 15-item measure—named the AMCQ—in which the three dimensions were each assessed using five items (see Appendix A). The model was then tested on the father related items. Last, two CFAs (one for each parent) were performed by considering only the two insecurity factors (i.e., anxiety and avoidance), and fit indexes were compared with the three-factor solution. All models were estimated using the weighted least squares mean and variance (WLSMV) estimation, which is appropriate for ordinal data (Flora & Curran, 2004). To evaluate model fit, several fit indexes were computed and evaluated, including the root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis index (TLI), and standardized root mean square residual (SRMR). Furthermore, because the chi-square statistic is sensitive to sample size (West et al., 2012), chi-square-to-degrees-of-freedom ratio (χ^2/df) was considered. A CFI and TLI greater than .95 and RMSEA less than or equal to .06 and a $\chi^2/df < 3$ indicate a good fit (Schermele-Engel et al., 2003). CFAs were performed with *lavaan* package (Rosseel, 2012).

Results

At a descriptive level, most mother and father items showed a skewed distribution. Item response distributions, together with the main descriptive statistics, are provided in the supplementary material section, available online (see Table S4).

The series of CFAs performed on the mother-related items yielded a 15-item model which had excellent values in all the considered indexes. Correlations between the avoidance and security factors ($r = -.782$) as well as between anxiety and security ($r = -.784$) were high.

However, it should be noted the amount of unshared variance between the insecurity factors and felt security was 39% for both anxiety and avoidance, therefore supporting only a partial overlap between the dimensions. The subsequent two-factor CFAs yielded an excellent fit in all the considered indexes (see Table 1).

Overall, the two models (two and three factors) exhibited equivalent fit indices, although a slight increase was observed in the two-factor solution. Therefore, we retested both models in a separate, larger sample and evaluated their association with a series of external variables (see Study 3).

Study 3: Testing Phase

In Study 3, we aimed to (1) directly compare the two- and three factor models of the AMCQ for both mother and father forms via CFA by involving a larger sample, (2) test concurrent validity of the questionnaire with theoretically related external variables, and (3) based on the selected model, test its factorial invariance across age and gender and its convergent validity with the short form of the ECR-RC.

Method

Participants. The study was introduced to 819 families of children recruited from primary and middle schools in Northeastern Italy. Of these, 786 children (96%) provided written consent from both parents. Thirty-eight children were absent on the day of data collection. Thus, 748 children were involved in the study. However, eight did not provide responses, and questionnaires completed by children with intellectual disabilities or with certified developmental/learning disorders ($n = 23$) were not considered for the purpose of the study. The final sample consisted of 717 participants (50.4% girls), of whom 5 children did not fill in the mother items, and 26 did not complete those related to the father, but were nonetheless retained. Missing data (<1%) were handled with the PML estimation method. In this sample, 50.8% children were aged between 8 and 10 years (hereafter labeled “younger children”; mean age = 9.23 years,

$SD = 0.83$, range = 7.92-10.0 years), and 49.2% were aged between 10.1 and 12.3 years (hereafter labeled “older children”; mean age = 11.3 years, $SD = 0.81$).

Procedure

A detailed description of the procedure is reported in Study 1. Children completed the 15 items derived from Study 2 referring to both mother and father, together with the sociodemographic form including age, gender, and the FAS (see Study 1, for a description). To assess concurrent validity of the final attachment questionnaire, they completed measures of general self-worth and perceived social support from family and friends. Furthermore, to test convergent validity of the AMCQ, they completed the short ECR-RC in relation to both parents.

Measures

General Self-Worth. Children completed the relevant subscale of the Self-Perception Profile for Children (Harter, 2012), which consists of six items that are rated using Harter’s (1982) format. Participants were instructed to choose the statement that best fitted them out of two presented, and then to indicate whether the statement they chose was “really true” or “sort of true” for them. Each item is rated on a 4-point scale, and scores across items are averaged to yield a global self-worth score, with higher scores reflecting higher self-worth. The questionnaire provided evidence for good psychometric properties in terms of factor structure, internal consistency, and convergent validity (Harter, 2012), also in the Italian population (Pedrabissi et al., 1988). In the current study, McDonald’s Omega was .84.

Social Support (Family and Friends). Children completed the two subscales referring to family and friends included in the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988). Each scale consists of four items scored on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*completely agree*). Scores across items are averaged to provide the respective overall scale scores, in which higher scores indicate greater perception of support. The questionnaire has been validated in numerous cultural contexts, including Italy (Prezza & Pacilli, 2002). In this study, McDonald’s Omegas were .82 and .80 for the friends and family subscales, respectively.

Attachment. To test convergent validity of the AMCQ, children completed the Italian version of the short form of the ECR-RC (Brenning et al., 2014; Marci et al., 2018b). The questionnaire consists of 12 items designed to capture attachment anxiety and avoidance in children and adolescents. Each item is rated on a 5-point Likert-type scale (from 1 = *strongly disagree* to 5 = *completely agree*).

Scores across items are averaged to provide an anxiety and an avoidance score, respectively; higher scores indicate greater anxious or avoidant attachment. In the current study, McDonald’s Omegas for the avoidance subscale were .84 (father) and .88 (mother), and .73 (mother) and .79 (father) for the anxiety items.

Data Analysis

First, we calculated item response distributions and computed the main descriptive statistics (i.e., mean, standard deviation, and skewness) for both mother and father items.

To establish the factor structure and to examine whether the attachment construct would be better represented by two (anxiety and avoidance) or three correlated factors (avoidance, anxiety, and security), a series of CFAs and structural equation modelings (SEMs) were conducted on both mother and father items. Specifically, we separately tested (1) a two- and a three-factor solution on the items derived from Study 2. In particular, the two-factor model only included the anxiety (five items) and avoidance (five items) factors; and (2) a three-factor solution, which additionally included the felt security factor (five items).

All models were estimated using the WLSMV estimator, and goodness-of-fit indexes were compared following the guidelines described in Study 2. In addition, to take the limitations inherent in Cronbach’s alpha coefficient into account (see Sijtsma, 2009), internal consistency was evaluated for both models via McDonald’s Omega computed on the CFA.

Next, to further define the structure of the scale for each model (i.e., two- and three-factor models), we evaluated its linkage with two external criterion measures via SEM. The rationale here was to examine whether security provided an additional contribution in explaining the variance of such variables over and above the contribution of anxiety and avoidance. In addition to testing the association across several models (i.e., one for each external measure), this procedure allowed us to ascertain the association with several related outcomes simultaneously, and was deemed appropriate because the underlying constructs often influence each other. In particular, for both the mother and father items, we examined the degree to which the two-factor model (i.e., anxiety and avoidance) and the three-factor model (avoidance, anxiety, and felt security) were associated with the latent scores of general self-worth and children’s perception of social support (as indexed by perceived support from friends and family). In sum, for each outcome (i.e., endogenous variable) we estimated two SEMs: one with anxiety and avoidance as predictors (i.e., exogenous variables), and the other with anxiety, avoidance, and felt security as predictors.

The models were evaluated for goodness-of-fit, significance of the structural coefficients between attachment

Table 2. Fit Indices for the Confirmatory Factorial Models (Two and Three factors) of the AMCQ (Study 3).

	$\chi^2_{\text{scaled}}/df$	CFI _{scaled}	TLI _{scaled}	RMSEA _{scaled} [90% CI]	SRMR
<i>Mother (n = 705)</i>					
M2.1: Two-factor	3.156	0.983	0.977	.055 [.044, .067]	.045
M2.2: Three-factor	2.435	0.979	0.975	.045 [.037, .053]	.046
<i>Father (n = 682)</i>					
M2.3: Two-factor	2.878	0.994	0.992	.053 [.041, .065]	.033
M2.4: Three-factor	2.984	0.989	0.986	.054 [.046, .062]	.037

Note. Two-factor model: anxiety, avoidance; three-factor model: anxiety, avoidance, and felt security. AMCQ = Attachment in Middle Childhood Questionnaire; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual.

factors and external criterion measures, and in terms of explained variance (i.e., R^2), which allowed us to evaluate the incremental contribution of the felt security factor in predicting the external measures.

After establishing the factor structure of the questionnaire, we examined its measurement invariance across age groups and gender. To this end, multigroup CFAs using theta parametrization (Millsap & Yun-Tein, 2004) were performed following a step by step procedure. In the first step, models were fit separately for younger and older children. Configural invariance was then tested by allowing the parameters to remain free across groups (except for the first loading, fixed to 1 for identification purposes). Then, metric and scalar invariance were simultaneously tested by constraining the factor loadings and thresholds to be equal across groups (Muthén & Muthén, 2010). Several fit indices (i.e., CFI, TLI, and RMSEA) were evaluated, and change in χ^2 —suggested as the best choice with robust WLS estimation (Sass et al., 2014)—together with the differences in CFI (Δ CFI) between proximal models were computed. A nonsignificant change in χ^2 per change in df (Sass et al, 2014) and a change in CFI less than .01, together with acceptable model fit indices, were considered evidence of model invariance (Chen, 2007). From an applied perspective, metric and scalar invariance are essential to compare scores across groups of children (i.e., younger vs. older children).

Finally, the questionnaire was tested for its convergent validity with anxiety and avoidance dimensions as assessed via the short ECR-RC.

Results

Consistent with the results of Study 1 and 2, most mother and father items showed a skewed distribution, further supporting the use of the WLSMV estimator for subsequent CFAs (Rhemtulla et al., 2012; see Table S6 within the supplementary material section, available online).

A CFA was run on the two- and three-factor models. In both mother and father forms, the two-factor model had

excellent values in all the considered indexes (see Table 2), and all factor loadings were large and significant at the 1% level (see Figure 1). Similar results emerged from the three-factor solution, which yielded an excellent fit in all the considered indexes (see Table 2). Again, factor loadings were large and significant at the 1% level (see Figure 2).

Furthermore, internal consistency suggested good indices of reliability for both mother and father-related subscales (see Table 3). As shown in figure 2, anxiety and avoidance in relation to both mother and father were positively correlated, whereas both insecurity dimensions were negatively linked to the felt security factor.

Next, the two and three-dimensional models in relation to mother and father were tested for their associations with the external measures. Both models reported good fit indexes. Overall, with a few exceptions, responses to mother and father items showed similar associations with these measures (see Figures A1 and A2 in the Appendix B, available in the online supplementary material). Specifically, higher levels of anxiety and avoidance were linked to lower self-esteem; in addition, more anxiety and avoidance were related to less perceived family support, while only avoidance was linked to less perceived friend support.

When the security factor was added as a predictor to avoidance and anxiety, higher levels of anxiety and avoidance remained associated with lower self-worth and less perception of family support, whereas only anxiety toward father remained negatively related to family support. Furthermore, higher levels of security toward mother (but not toward father) were associated with higher self-worth and with an increased perception of social support from friends and family.

The results were overall similar when we evaluated the contribution of attachment dimensions to the external measures in separate models (see p. 10 within the supplementary material section, available online). With regard to the explained variance of the endogenous variables, results showed a slight increase in explaining the external measure for mother-related items (see Appendix B, available in the online supplementary material).

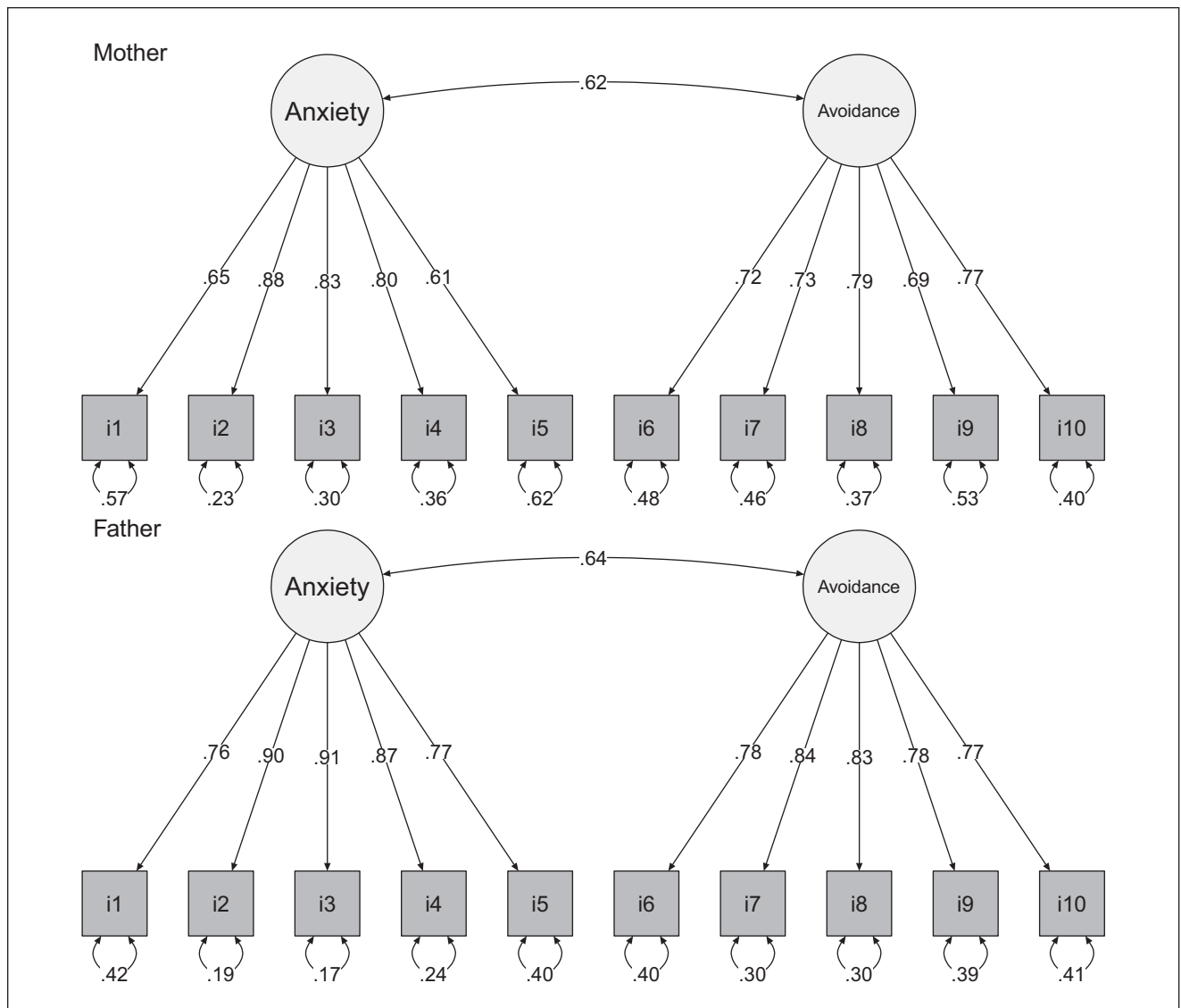


Figure 1. Confirmatory factor model of the two factors of the AMCQ.

Note. All structural coefficients are standardized. All factor loadings are significant at the .05 level. Mother, $n = 705$; Father, $n = 682$. AMCQ = Attachment in Middle Childhood Questionnaire.

Based on these results, and consistent with extant theory and empirical findings, we elected that the instrument would be composed of two main dimensions; namely, anxiety and avoidance, and the felt security factor was included within the questionnaire as a supplementary scale.

To test measurement invariance of the AMCQ, a multi-group CFA was performed across age groups (younger vs. older children). Given that the security factor was included as a supplementary scale, measurement invariance was evaluated for the two and the three-factor models. The two-factor solution reached good fit indices for both younger and older children (see Table 4). Configural invariance (without parameter restrictions) revealed a good model fit to the data (see STEP 1, Table 4), suggesting that the factor

structure was similar between the two age groups. The subsequent step (STEP 2, Table 4), in which loadings and thresholds were held invariant across groups, yielded a good fit to the data. Furthermore, ΔCFI s between the constrained and unconstrained models were less than .01 (see Table 4), with a nonsignificant scaled χ^2 difference (mother form: $\Delta\chi^2(26) = 38.4, p = .055$; father form: $\Delta\chi^2(26) = 29.8, p = .28$), indicating that scalar invariance was achieved.

Following the same procedure, measurement invariance was evaluated for the three-factor model. Again, invariance across groups was supported, since all models showed good fit indexes, and ΔCFI s between the constrained and unconstrained models were less than .01 (see Table 4); furthermore,

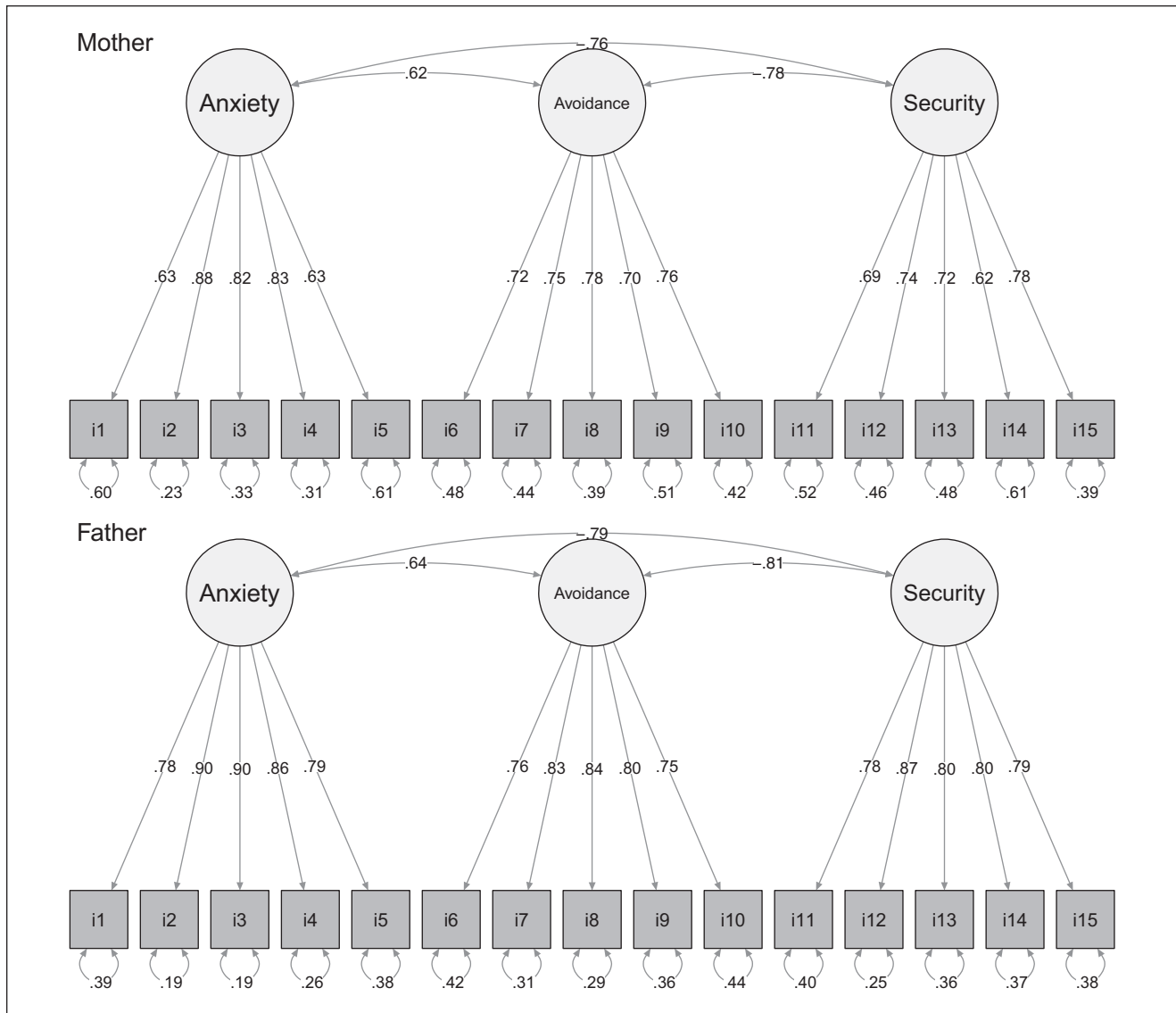


Figure 2. Confirmatory factor model of the three factors of the AMCQ.
 Note. Mother, $n = 705$; Father, $n = 682$. All structural coefficients are standardized. All factor loadings are significant at the .05 level. AMCQ = Attachment in Middle Childhood Questionnaire.

Table 3. Reliability Indices for Anxiety, Avoidance, and Felt Security Factors (Study 3).

Factors	Mother ($n = 705$)	Father ($n = 682$)
	McDonald's omega	McDonald's omega
Anxiety	.78	.87
Avoidance	.81	.86
Felt security	.76	.85

Note. McDonald's Omegas were computed on the confirmatory factor analysis.

the scaled χ^2 difference was not significant, mother form: $\Delta\chi^2(39) = 47.1, p = .17$; father form: $\Delta\chi^2(39) = 44.8, p = .24$. Factor loadings across age groups are provided within

the online supplementary materials (see Table S7 and Table S8), together with the main descriptive statistics (M and SD) for each subscale across age groups (see Table S9). Additional

Table 4. Model Fit for the Maternal and Paternal Two- And Three-Factor Models Tested for Invariance Across Age Groups (Study 3).

	$\chi^2_{\text{scaled}}/df$	CFI _{scaled}	TLI _{scaled}	RMSEA _{scaled} [90% CI]	SRMR	Δ CFI _{scaled}
<i>Two-factor model</i>						
Mother form						
Younger children	1.506	.985	.980	.038[.012, .058]	.055	
Older children	1.913	.991	.987	.051[.032, .070]	.047	
STEP 1: Configural	1.713	.989	.986	.045[.031, .059]	.051	
STEP 2: Metric and scalar	1.654	.986	.987	.043[.031, .055]	.055	-.003
Father form						
Younger children	1.323	.996	.994	.031[.000, .054]	.043	
Older children	2.624	.993	.990	.069[.051, .086]	.041	
STEP 1: Configural	2.028	.993	.991	.055[.042, .068]	.042	
STEP 2: Metric and scalar	1.752	.993	.993	.047[.035, .059]	.043	.000
<i>Three-factor model</i>						
Mother form						
Younger children	1.368	.981	.977	.032 [.015, .046]	.062	
Older children	1.674	.985	.987	.044 [.031, .056]	.050	
STEP 1: Configural	1.520	.986	.983	.038 [.029, .048]	.056	
STEP 2: Metric and scalar	1.421	.986	.987	.035 [.025, .043]	.058	.000
Father form						
Younger children	1.460	.988	.985	.037 [.022, .051]	.049	
Older children	2.404	.989	.987	.064 [.053, .075]	.046	
STEP 1: Configural	1.974	.985	.987	.054 [.045, .062]	.048	
STEP 2: Metric and scalar	1.765	.988	.988	.047 [.039, .055]	.048	.000

Note. Mother form: Younger children, $n = 357$; Older children, $n = 348$. Father form: Younger children, $n = 335$; Older children, $n = 347$. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; SRMR = Standardized root mean square residual. Δ CFI = difference among CFIs.

analyses confirming factorial invariance between boys and girls are also provided within the supplementary material section, available online (see p. 14).

To assess convergent validity, we evaluated latent correlations between anxiety, avoidance, and the felt security dimension as assessed via the new questionnaire, and the two dimensions of the short ECR-RC. As expected, we found a strong positive association between the corresponding dimensions in both mother (anxiety: $r = .698$, avoidance: $r = .921$) and father forms (anxiety: $r = .732$, avoidance: $r = .925$), and a negative association between felt security and the ECR-RC anxiety (mother: $r = -.488$; father: $r = -.470$) and avoidance subscales (mother: $r = -.713$; father: $r = -.761$).

Discussion

The quality of parent–child relationships undergoes substantial changes during middle childhood, but the assessment of attachment in this developmental period remains an important challenge in the field. Thus, the availability of reliable and valid measures is of utmost importance for both theoretical and practical concerns. If procedures are not age-appropriate, comprehensive, and psychometrically sound, their application may lead to inaccurate or even

erroneous conclusions. To address these important issues, the current study built on extant self-report measures of attachment and used three separate samples of Italian school-age children to develop an age-appropriate questionnaire to assess attachment in middle childhood—the AMCQ—by incorporating items that measure anxiety, avoidance, and felt security in relation to mother and father. Furthermore, we tested its convergent validity, and invariance across age and gender. From a theoretical perspective, the study also addressed whether two separate factors, namely anxiety and avoidance, appropriately reflected attachment representations in this developmental period, or if a third factor, that is, felt security, contributed to an improvement in the assessment of attachment in middle childhood. Indeed, despite some authors raised concerns about the ability of the two insecurity dimensions to sufficiently capture the security region of attachment (e.g., Fraley et al., 2000), empirical evidence is still lacking.

The AMCQ resulted in the selection of 15 items divided into three factors (i.e., anxiety, avoidance, and felt security), in which the two- and three-factor models were equally plausible based on the results of factor analyses. However, evaluation of their contribution to explaining the external measures indicated that the security factor showed some additional and theoretically meaningful associations with

specific variables (as discussed below) over and above the contribution of anxiety and avoidance. Thus, we deemed the three-factor solution as more appropriate and informative.

As expected, a negative association emerged between insecurity dimensions (anxiety and avoidance) and the security factor. Furthermore, in line with previous studies (see Cameron et al., 2012), a positive association emerged between anxiety and avoidance. This result may be interpreted in relation to the attachment behavioral regulation system, in which anxiety reflects a monitoring system, whereas avoidance serves as behavioral orientation system (Fraley & Shaver, 2000). For example, avoidance of intimacy could be viewed as a consequence of anxiety about rejection; thus, the mutual feedback between attachment-related dimensions may translate into a positive intercorrelation (Conradi et al., 2006).

When we evaluated the associations of the two models with a number of external measures, namely self-worth and children's perception of social support from friends and family, the expected correlations were found for the two-factor model, with children's responses to mother and father items showing similar associations with the external measures. More specifically, and in line with previous studies (i.e., Brenning et al., 2011; Marci et al., 2018b), lower levels of anxiety and avoidance toward both mother and father were related to higher self-worth. This finding is consistent with attachment theory, which posits that the quality of attachment has important implications for the development of the self (Cassidy, 1990; Mikulincer, 1998; Mikulincer & Shaver, 2012). In particular, secure children are more likely to combine a positive view of the self and others, and therefore evaluate themselves more favorably than insecurely attached children. When the security factor was added as a predictor, higher levels of anxiety and avoidance remained associated to lower self-worth. Moreover, higher levels of security were associated with higher self-worth, but only in the mother form.

From an empirical perspective, this result suggests that the felt security items related to mother capture an additional aspect of attachment representations (over and above anxiety and avoidance) which may provide useful information with regard to the development of a positive sense of self. From a theoretical perspective, this pattern is consistent in line with attachment theory which posits that secure children construct a positive working model of the self and others, thus evaluating themselves more favorably than insecurely attached children, whose development of self-confidence and self-esteem may be compromised (Mikulincer, 1998; Mikulincer & Shaver, 2012). Moreover, prior studies highlight the increased relevance of mother attachment for one's self-worth in middle childhood (Kerns et al., 1996; Younger et al., 2005).

With regard to perceived social support, higher levels of anxiety and avoidance toward both mother and father were found to be associated with less perceived social support from the family. In addition, more avoidance was linked to less perceived support from friends. When considered from an attachment perspective (Bowlby, 1973), these results are not surprising because negative representations of the self and others—which often characterize avoidant and anxious/ambivalent individuals—make insecure people more prone to encoding and recalling instances of helpful behavior as less supportive. The fact that the avoidant attachment style was specifically related to less perceived support from friends is consistent with previous studies suggesting that the early experience of rejection may affect the development of confidence in the availability of others (Collins & Read, 1990) which, in turn, might compromise the capacity for adequate social functioning in terms of, for example, the ability to recruit supportive friendships (Mallinckrodt, 2000, 2001). When the security factor was added to the model, these associations remained significant, except for the negative link between avoidance toward mother and support from friends. However, a positive association between security toward mother and perception of support from friends and family emerged. The latter finding is in line with attachment theory, according to which individuals with a secure attachment develop a positive view of themselves and others (Cassidy, 1990) and further stresses that in the mother form, the security factor provides a more comprehensive picture of attachment representations in terms of security versus insecurity in middle childhood.

In sum, the results in terms of external validity emerging from the two-factor model can be explained in light of attachment theory and showed consistency with previous studies. When the security factor was included in the model, the explained variance of the endogenous variables showed an overall valuable increase in the mother, but not in the father form. This discrepancy may be attributed to the differential functions of attachment representations toward each parent and their effects on different aspects of children's socioemotional adjustment (Bureau et al., 2020; Grossmann & Grossmann, 2019). Future research may include additional measures and constructs to evaluate the contribution of felt security to other outcomes that have been found to be more affected by the quality of the attachment relationship toward father in comparison to mother. For example, Cummings et al. (2013) found that mother-child attachment predicted peer relationship problems, whereas father-child attachment was linked to conduct problems. This pattern might reflect the difficulty to manage increased autonomy among early adolescents, who therefore exhibit more behavioral problems at this age. Further studies may also consider to include more specific

items related to the father–child relationship (e.g., “Some children like to play with their father, BUT other children do not like play with their father”) to better reflect secure child–father attachment representations.

In terms of invariance across age and gender, multigroup CFAs supported configural and metric invariance of the AMCQ. Thus, the instrument assessed attachment avoidance, anxiety, and felt security in the same way for younger and older children in middle childhood as well as between boys and girls, thereby enabling to directly compare anxiety, avoidance, and security scores.

In relation to convergent validity, as expected, strong correlations between the corresponding dimensions of the AMCQ and the short ECR-RC (i.e., anxiety and avoidance) emerged, and higher security scores (as assessed by the AMCQ supplementary scale) were associated with lower ECR-RC anxiety and avoidance scores.

Overall, our results are aligned with the concerns raised by some authors (Fraley et al., 2000; Younger et al., 2005) with regard to the ability of the two dimensions, namely anxiety and avoidance, to capture the entire security region. Indeed, our data suggest that the felt security factor meaningfully contributes to the assessment of attachment toward mother when gauged in association with anxiety and avoidance. Thus, we propose that a questionnaire assessing both security and insecurity dimensions might provide a more nuanced picture of the risk and protective processes involved in children’s socioemotional adjustment during middle childhood. Specifically, to better capture individual differences in attachment, a measure tackling both security and insecurity might provide a more accurate picture of what attachment looks like in school-age children. This measure could be particularly useful in the context of empirical studies involving subjects not at risk for high levels of insecurity (e.g., the normative population, which might exhibit a floor effect in relation to insecurity scores), as well as to investigate the impact of intervention programs aiming to promote secure attachment relationships in children. The identification of assets together with possible risk factors concerning the quality of individuals’ attachment relationships is also highly relevant when working with clinical samples, as it may provide points of entry for intervention (Sesma et al., 2013). For these reasons, the AMCQ was elected as being composed of a principal scale comprising two dimensions (anxiety and avoidance), and a supplementary scale measuring felt security.

The current work adds to the literature by underscoring the complex nature of attachment relationships in middle childhood, which need to be assessed via psychometrically sound instruments to avoid misinterpretations and inaccurate conclusions. Furthermore, the results highlight the need for a better understanding of paternal attachment and

its differential functioning as a “safe haven—secure base” compared with maternal attachment. From this perspective, and based on the results obtained in our three studies, the AMCQ can be viewed as a promising tool to assess the quality of child–parent attachment in this specific developmental period, and may represent a starting point for further studies taking into account specific aspects of fathering which contribute to the development of child–father secure attachment representations (e.g., support of play and exploration).

Some limitations should be noted when interpreting the results. First, our participants represented typically developing samples, with most children originating from high or medium socioeconomic status families. Research involving at-risk samples and more socioeconomically diverse groups is warranted to ascertain whether the types of validity addressed in this study may also be found in clinical populations and/or in low socioeconomic status children, particularly in relation to the supplemental security subscale. Second, the association between AMCQ scores and external measures was tested separately for the mother and father forms rather than in a single model. However, given that the main aims of the current study were to define the structure of the new tool (i.e., testing two- and three-factor models) and to assess external validity, this analysis was deemed beyond the scope of this study; moreover, testing these associations simultaneously would have involved a remarkable increase in the number of parameters to be estimated as well as in the complexity of relationships. Thus, this study may be viewed as a starting point for future research aiming to shed light on the nature and direction of these associations. Third, we exclusively relied on self-report measures to assess convergent and concurrent validity. Future studies using multiple methods, such as interviews and behavior observations, together with multiple informants (e.g., teachers, parents), are warranted to gain a more nuanced picture of attachment representations in middle childhood.

Despite these shortcomings, our study contributes to the extant literature by proposing a brief, nonredundant, and comprehensive questionnaire which is psychometrically sound, easy to administer, and respectful of children’s cognitive characteristics in middle childhood. Although more research is needed to ascertain its reliability and validity in other national contexts, the AMCQ seems to adequately capture the components of anxious, avoidant, and secure representations in middle childhood. Future studies may build on these findings to test the cross-cultural validity of the AMCQ by involving samples from different countries, to assess its invariance across parents, and to examine test–retest reliability over both short and long time periods.

Appendix A

The Attachment in Middle Childhood Questionnaire (AMCQ).

	Italian	English
1*	Alcuni bambini si preoccupano che la loro mamma/il loro papà possa abbandonarli INVECE Altri bambini sono sicuri che la mamma/il loro papà non li abbandonerà mai	Some kids are worried that their mom/dad might want to leave them BUT Other kids are sure that their mom/dad will never leave them
2*	Alcuni bambini hanno paura che la mamma/il papà non voglia loro realmente bene INVECE Altri bambini sono sicuri che la mamma/il papà voglia loro bene	Some kids are worried that their mom/dad doesn't really love them BUT Other kids are sure that their mom/dad really loves them
3*	Alcuni bambini hanno paura che la mamma/il papà non provi per loro quell'affetto che loro provano per lei/lui INVECE Altri bambini sono sicuri che la mamma/il papà provi per loro lo stesso affetto che loro provano per lei/lui	Some kids are worried that their mom/dad doesn't love them as much as they love her/him BUT Other kids are sure that their mom/dad loves them as much as they love her/him
4*	Alcuni bambini, quando mostrano alla loro mamma/al loro papà che le/gli vogliono bene, hanno paura che lei/lui non gliene voglia altrettanto INVECE Altri bambini, quando mostrano alla loro mamma/al loro papà che le/gli vogliono bene, sono sicuri che lei/lui gliene voglia altrettanto	Some kids, when they show their mom/dad that they love her/him, are afraid s/he doesn't love them as just as much BUT Other kids, when they show their mom/dad that they love her/him, are sure s/he loves them as just as much
5*	Alcuni bambini quando non sono con la loro mamma/il loro papà hanno paura che lei/lui non pensi più a loro INVECE Altri bambini sono sicuri che la loro mamma/il loro papà pensa a loro anche quando non sono con lei/lui	When they don't see their mom/dad, some kids worry she/he may stop thinking about them BUT When they don't see their mom/dad, other kids know that s/he still thinks about them
6*	Ad alcuni bambini non piace dire alla loro mamma/al loro papà quello che sentono veramente nel profondo INVECE Ad altri bambini piace dire alla loro mamma/al loro papà quello che sentono veramente nel profondo	Some kids don't like to tell their mom/dad how they feel deep down inside BUT Other kids like to tell their mom/dad how they feel deep down inside
7	Per alcuni bambini è facile parlare con la loro mamma/il loro papà delle cose che li riguardano INVECE Per altri bambini non è facile parlare con la loro mamma/il loro papà delle cose che li riguardano	For some kids it is easy to tell a lot about themselves to their mom/dad BUT Other kids find it hard to tell a lot about themselves to their mom/dad
8	Alcuni bambini parlano con la loro mamma/il loro papà quasi di tutto INVECE Altri bambini trovano difficile parlare con la loro mamma/il loro papà di molte cose	Some kids tell their mom/dad nearly everything BUT Other kids find it hard to tell their mom/dad nearly everything
9	Alcuni bambini parlano con la mamma/il papà dei loro problemi e delle loro preoccupazioni INVECE Altri bambini non parlano con la mamma/il papà dei loro problemi e delle loro preoccupazioni	Some kids usually talk to their mom/dad about their problems and worries BUT Other kids don't talk to their mom/dad about their problems and worries
10*	Ad alcuni bambini non piace veramente raccontare alla mamma/al loro papà quello che pensano o che sentono INVECE Ad altri bambini piace raccontare alla mamma/al papà quello che pensano o che sentono	Some kids do not really like telling their mom/dad what they are thinking or feeling BUT Other kids do like telling their mom/dad what they are thinking or feeling
11*	Per alcuni bambini è facile avere fiducia nella loro mamma/nel loro papà INVECE Altri bambini non sono sicuri se possono avere fiducia nella loro mamma/nel loro papà	Some kids find it easy to trust their mom/dad BUT Other kids are not sure if they can trust their mom/dad
12*	Per alcuni bambini è facile contare sulla mamma/sul papà per avere aiuto INVECE Altri bambini sentono che è difficile contare sulla mamma/sul papà per avere aiuto	Some kids find it easy to count on their mom/dad for help BUT Other kids think it's hard to count on their mom/dad
13*	Alcuni bambini sentono che la loro mamma/il loro papà li capisce veramente INVECE Altri bambini sentono che la loro mamma/il loro papà non li capisce veramente	Some kids feel like their mom/dad really understands them BUT Other kids feel like their mom/dad does not really understand them
14	Alcuni bambini pensano che la loro mamma/il loro papà non li ascolta INVECE Altri bambini pensano che la loro mamma/il loro papà li ascolta	Some kids think their mom/dad does not listen to them BUT Other kids do think that their mom/dad listens to them
15*	Per alcuni bambini è facile fare affidamento sulla mamma/sul papà INVECE Per altri bambini è difficile fare affidamento sulla mamma/sul papà	Some kids find it easy to rely on their mom/dad BUT Other kids find it hard to rely on their mom/dad

Note. *Reversed items. Items 10, 11, 12, 13, 14 were selected from the SS; the remaining items were adapted from the ECR-RC. Items 1–5: anxiety; items 6–10: avoidance; items 11–15: felt security. Items were presented in the following order: 1, 6, 5, 7, 11, 15, 8, 12, 3, 4, 9, 14, 10, 2, 13.

Appendix B

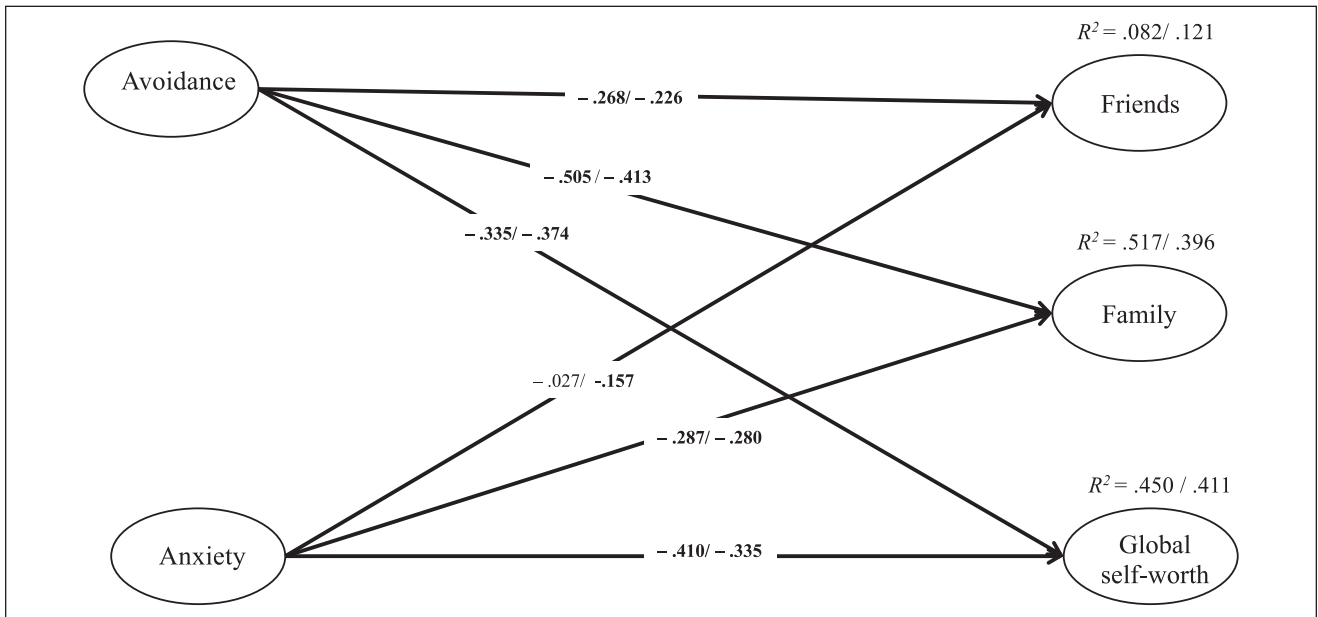


Figure A1. Structural Equation Model of the association between the two-factor model (anxiety and avoidance, mother and father items), perceived social support from friends and family, and general self-worth. All structural coefficients are standardized. Note. Mother (n=705) /Father (n=682) parameters. Significant parameters at the 0.05 level are reported in bold.

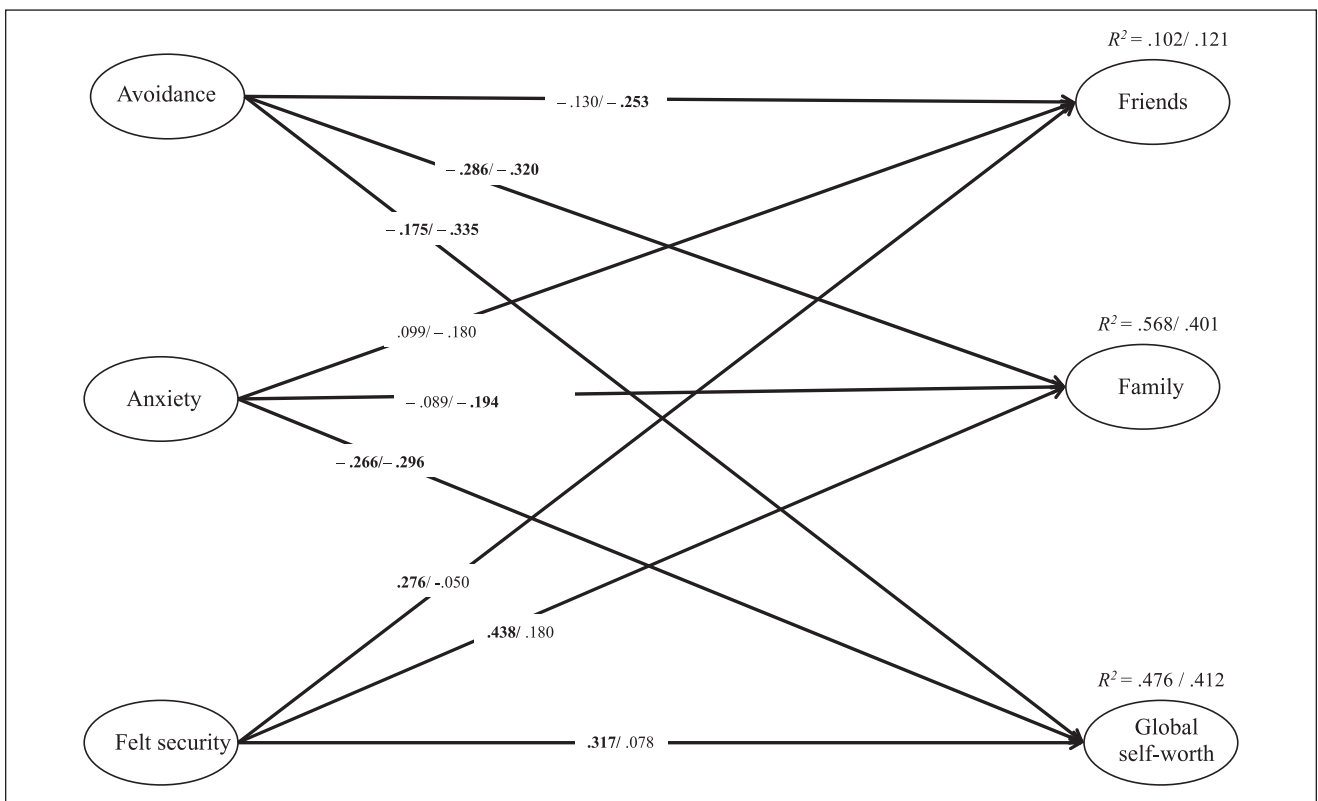


Figure A2. Structural Equation Model of the association between the three factor model (anxiety, avoidance and felt security, mother and father items), perceived social support from friends and family, and general self-worth. All structural coefficients are standardized. Note. Mother (n=705) /Father (n=682) parameters. Significant parameters at the 0.05 level are reported in bold.

Table A1. Model fit for the models represented in Figure A1 and A2.

	Mother				Father			
	χ^2/df	CFI	TLI	RMSEA [90% CI]	χ^2/df	CFI	TLI	RMSEA [90% CI]
Models figure A1	2.055	.965	.961	.039 [.035 – .042]	1.950	.975	.973	.037 [.034 – .041]
Models figure A2	1.817	.967	.964	.034 [.031 – .037]	1.804	.976	.974	.034 [.031 – .037]

Note. All indexes are scaled. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square of Approximation.

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Supplemental Material

Supplemental material for this article is available online.

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