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REVIEW ARTICLE

The Security Scale as a measure of attachment: meta-analytic evidence of validity

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ABSTRACT

This meta-analysis evaluated the psychometric properties of the Security Scale (SS; k = 57 studies), a measure specifically designed to assess attachment in middle childhood, using several criteria: stability over time, associations with other attachment measures, relations with caregiver sensitivity, and associations with theoretically driven outcomes. The SS demonstrated moderate stability and meaningful associations with other attachment measures and caregiver sensitivity. Furthermore, the SS showed significant associations with developmental correlates of attachment: school adaptation, emotional and peer social competence, self-esteem, and behavioral problem. Some effect sizes varied as a function of socioeconomic status (SES; peer social competence and maladjustment) and publication status (emotional competence, peer social competence, and self-esteem). The association between the SS and our constructs of interest were, for the most part, independent of geographical location and child gender or age. Overall, findings suggest that the SS is a robust measure of attachment in middle childhood and early adolescence.

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KEYWORDS
The Security Scale; attachment security; middle childhood; validity; meta-analysis

Bowlby's (1969, 1973) attachment theory is one of the most comprehensive theoretical frameworks for understanding social and emotional development. Two central tenets of attachment theory are that all children form attachments as long as a parental figure is available, even if that caregiving figure provides less than optimal care, and that the quality of the parent–child attachment relationship depends on the quality of care children receive (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969). Specifically, in the presence of sensitive and responsive care, children are able to use the parent as a safe haven and secure base and, in turn, form secure attachments to their caregivers (Bowlby, 1969, 1973). A wealth of empirical evidence, based primarily on samples of young children, have validated Bowlby's proposal that the security of parent–child attachment is a powerful environmental determinant of later development and adaptation (e.g. DeKlyen & Greenberg, 2016; Groh, Fearon, IJzendoorn, Bakermans-Kranenburg, & Roisman, 2017; Madigan, Atkinson, Laurin, & Benoit, 2013). There is also substantial

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Supplemental data for this article can be accessed here.

evidence that parental caregiving is the most consistent predictor of a secure parent–child attachment (De Wolff & van IJzendoorn, 1997; Lucassen, Tharner, van IJzendoorn, Bakermans-Kranenburg, & Volling et al., 2011; Verhage et al., 2016).

The preponderance of research in the years since Bowlby's (1969) initial theorizing on parent–child attachment has focused on precursors and consequences of infant–parent attachment. However, Bowlby (1969) endorsed the notion that attachment relations are significant for life span development. Therefore, in the last decade and a half, there has been an emerging line of research on middle childhood attachment; however, this research is still in its formative years compared to other developmental periods (Kerns & Brumariu, 2016). A key challenge in studying this developmental epoch has been methodological in nature. Research in infancy, early childhood, and adolescence/adulthood has primarily relied on behavioral (e.g. the Strange Situation Procedure; Ainsworth et al., 1978) or representational measures of attachment (e.g. Adult/Adolescent Attachment Interview, AAI; George, Kaplan, & Main, 1996), which have been widely used and rigorously validated. Other studies have used questionnaires to assess parent–child attachment in adolescence (e.g. the Experiences in Close Relationships Scale-Revised, child version (ECR-RC); Brenning, Soenens, Braet, & Bosmans, 2011) or romantic attachment in older adolescents and young adults (the Relationship Questionnaire, RQ; Bartholomew & Horowitz, 1991; the Experiences in Close Relationships Scale-Revised, ECR-R; Fraley, Waller, & Brennan, 2000).

Initially, there were few measurement choices in the middle childhood period, and accordingly, several measures were developed, including story-stem procedures (e.g. Granot & Mayseless, 2001; Kerns, Brumariu, & Seibert, 2011), script story assessments (Psouni & Apetroaia, 2014; Waters, Bosmans, Vandevivere, Dujardin, & Waters, 2015), autobiographical interviews (e.g. Kriss, Steele, & Steele, 2012; Shmueli-Goetz, Target, Fonagy, & Datta, 2008), and self-report questionnaires (e.g. Kerns, Aspelmeier, Gentzler, & Grabill, 2001). At present, however, there is no dominant methodological approach to studying security of attachment in middle childhood (Bosmans & Kerns, 2015; Kerns & Brumariu, 2016). While reliance on a variety of measures allows for a thorough assessment of the attachment construct, a critical need for the field is to meta-analytically evaluate the validity of middle childhood measurement approaches, particularly those that have already generated validity data and have been extensively used, in order to increase confidence in results and derive conclusions regarding their use (Bosmans & Kerns, 2015; Kerns & Brumariu, 2016). Thus, the purpose of the present study is to evaluate the validity of the Security Scale (SS, Kerns et al., 2001), one of the most widely used measures of attachment in middle childhood and early adolescence, through a meta-analytic synthesis of existing research.

The Security Scale

The SS was developed to capture Bowlby's conception of the secure base construct. The items assess the degree to which children believe an attachment figure is responsive and available, rely on the attachment figure during times of stress, and have an ease and interest in communicating with an attachment figure (Kerns, Klepac, & Cole, 1996). The original instrument was designed to assess children's perceptions of attachment security with a specific attachment figure (e.g. father). It was developed to address a

"measurement gap" in the field as, at that time, there were no validated measures to assess attachment for children in the later middle childhood years (8–12 years), although it has been used outside this age range. The SS consists of 15 items and uses the "Some kids… Other kids…" format pioneered by Susan Harter (1982), and scores on the items are summed to obtain a single score on a security dimension. Importantly, it has been employed in a substantial number of studies designed to assess the precursors, concomitants, and antecedents of attachment. Thus, it is critical to rigorously investigate the psychometric properties of the SS to ensure that it measures attachment consistently and with adequate predictive power. A quantitative review will allow for more nuanced conclusions regarding the validity of the SS and will chart avenues for its use in future research.

To evaluate the psychometric properties of the SS, we relied on five criteria: (1) stability over time; (2) concordance with other attachment measures; (3) whether theoretical precursors (i.e. caregiver sensitivity) predicted the SS; (4) whether the SS predicted developmental outcomes; and (5) whether the SS demonstrated validity across sex, age, and cultures. First, extant theory emphasizes that attachment security with a caregiver should show some consistency over time as long as there is continuity in the caregiving environment (Solomon & George, 2016). In support of this notion, meta-analytic findings show that attachment is moderately stable from infancy to any later point in time (Fraley, 2002; Pinquart, Feußner, & Ahnert, 2013), although the security of parent–child relationships may change in response to significant relationship disruptions and evolving life circumstances (Waters, Hamilton, & Weinfield, 2000). Thus, we expected that attachment security as assessed with the SS would show moderate consistency over time.

Second, each attachment measure should, in theory, be rooted in the foundational concepts of attachment theory put forward by pioneers of the field (e.g. the secure base construct, Waters & Cummings, 2000). Despite this guideline to measurement approaches, correspondence between security of attachment across various measures is often only small to moderate in magnitude, regardless of the assessment age (see Crowell, Fraley, & Shaver, 1999; Pinquart et al., 2013; Solomon & George, 2016; for reviews, see also Kerns Abraham, Schlegelmilch, & Morgan, 2007). Thus, in the current study, we examine the extent to which the SS converged with other measures of attachment available for middle childhood and early adolescence, and consistent with previous research, our expectation was that associations would be weak to moderate.

Third, to be valid, a measure of attachment security should be related to established theoretical precursors (Solomon & George, 2016). Central to Ainsworth et al.'s (1978) theorizing was the prediction that a caregiver who is sensitive and responsive to the child's needs, and is able to facilitate harmonious interactions with the child, promotes a secure attachment relationship. Thus, we assess whether caregiver's sensitive care is associated with the SS. Meta-analytic findings based on studies with younger children documented that the effects of sensitivity are small to moderate in magnitude (De Wolff & van IJzendoorn, 1997; Lucassen et al., 2011; Verhage et al., 2016); thus, we expected similar effects herein.

Fourth, in line with the notion that attachment security provides a foundation for healthy development and psychological functioning throughout the lifespan (Bowlby, 1973), the SS should predict key developmental outcomes (Solomon & George, 2016),

including school adaptation, emotional competence, peer social competence, self-esteem, and (mal)adjustment. Specifically, Sroufe (1988) argued that more securely attached children may show greater school adaptation due to an increased sense of competence, and existing data provide support for this hypothesis (Kerns & Brumariu, 2016). Furthermore, more securely attached children and adolescents purportedly acquire enhanced emotion regulation strategies for coping with distress, and are effectively able to manage their emotional world even in the absence of caregivers, and are thus expected to be more emotionally competent (Brumariu, 2015; Contreras & Kerns, 2000; Cooke, Stuart-Parrigon, Movahed-Abtahi, Koehn, & Kerns, 2016). In addition, securely attached children are likely to learn socially competent interaction styles from their caregivers, and meta-analytic results document that attachment security in childhood and adolescence is related to social behavior, friendship, and popularity with peers (Groh et al., 2014; Pallini, Baiocco, Schneider, Madigan, & Atkinson, 2014). Furthermore, Bowlby (1973) proposed that securely attached children perceive themselves as worthy of affection, and overall, studies support the notion that attachment security is linked with positive and balanced views of the self (see Kerns & Brumariu, 2016). Finally, secure attachment is hypothesized to provide a healthy foundation for development, whereas attachment insecurity may set the stage for the development of clinical symptoms. A plethora of evidence supports the claim that insecure attachment is related to indices of internalizing and externalizing problems across childhood and adolescence (e.g. Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Groh, Roisman, van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012; Madigan et al., 2013; Madigan Brumariu, Villani, Atkinson, & Lyons-Ruth, 2016). Thus, as a fourth validity criterion, we examine the links between the SS and theoretically and empirically supported developmental correlates (Solomon & George, 2016).

Our last validity criterion concerns validity of the SS across sex, age, and cultures. Studies have demonstrated that attachment security, evaluated primarily in adulthood with a narrative measure, does not vary across sex (Bakermans-Kranenburg & van IJzendoorn, 2009; Van IJzendoorn & Bakermans-Kranenburg, 2010). In addition, previous meta-analytic findings across childhood and adolescence suggest that sex is not a consistent moderator of the association between attachment and developmental outcomes (e.g. Madigan et al., 2013, 2016). As described earlier, the SS has been used outside the middle childhood age range (e.g. in adolescence), so it is also important to determine whether age moderates the associations of the SS with other constructs to evaluate its usefulness at different ages. Solomon and George (2016) further argued that a measure of security should be valid cross-culturally, and a significant number of studies document the universality of secure attachment across cultures (Bakermans-Kranenburg & van IJzendoorn, 2009; van IJzendoorn & Bakermans-Kranenburg, 2010). Thus, as a fifth validity criterion, we conducted moderation analyses to examine whether security assessed with the SS is independent of child's sex, age, and geographical region.

The current study

In sum, this study employs meta-analytic techniques to investigate the psychometric properties of the SS. Consistent with previous meta-analyses in the field, we also investigate whether a set of potential moderators strengthen or weaken associations

between the SS and our constructs of interest in addition to sex, age, and culture. These include (a) socioeconomic status (SES) because it has been linked with lower levels of security (Cyr, Euser, Bakermans-Kranenburg, & van IJzendoorn, 2010; van IJzendoorn & Bakermans-Kranenburg, 2010) and shown to moderate associations between child attachment and developmental outcomes in some meta-analyses (Madigan et al., 2016); (b) time between assessments; (c) type of research design utilized (e.g. cross-sectional vs. longitudinal), as effect sizes can diminish when there is greater temporal distance between constructs (Atkinson et al., 2000); (d) publication status (i.e. dissertation vs. publication) due to the tendency for non-published findings to have smaller effect sizes (Verhage et al., 2016); and (e) for the examination of the strength of the association between the SS and other attachment measures, we examine the type of measurement approach (i.e. observational, representational, and questionnaires) as effect sizes tend to vary according to the types of attachment methodology being used (Madigan et al., 2016).

Methods

Search procedures

We followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) recommendations for reporting systematic reviews (Moher, Liberati, Tetzlaff, & Altman, 2009; see Figure 1). The searches were conducted by a medical librarian using the following databases: MEDLINE, EMBASE, PsycINFO, Social Work Abstracts, Web of Science, ProQuest Dissertations & Theses Full Text. Our search was restricted to published and unpublished studies in English through June 2015. The primary identifier or keyword in the title or abstract was "security scale." To identify studies meeting inclusion criteria, two authors reviewed all 1330 abstracts identified in the search strategy. As an additional search strategy, reference lists of included articles were searched. A study was included if it fulfilled the following four criteria, the study: (1) used the SS (Kerns et al., 2001); (2) involved children under 18 years of age; (3) was written in English; and (4) had statistics that could be transformed into an effect size.[1] Fifty-seven studies met the study inclusion criteria (see Figure 1). Study characteristics are presented in Table 1.

Data extraction

A protocol for selecting nonoverlapping samples was derived so that each sample was represented only once in the relevant meta-analyses. Specifically, overlapping samples of participants were identified by cross-referencing authorship across multiple publications as well as cross-referencing studies with sample sizes of similar magnitude to determine whether participants originated from the same dataset. If a sample of participants was included in more than one study, we selected the study with the largest sample size and most comprehensive data extraction information. When a paper presented results separately for subgroups within the sample (e.g. maltreated versus non-maltreated), we pooled the data within the study. When a paper presented multiple studies (i.e. nonoverlapping samples of participants within the same publication), effects sizes from each study were included as they represented independent

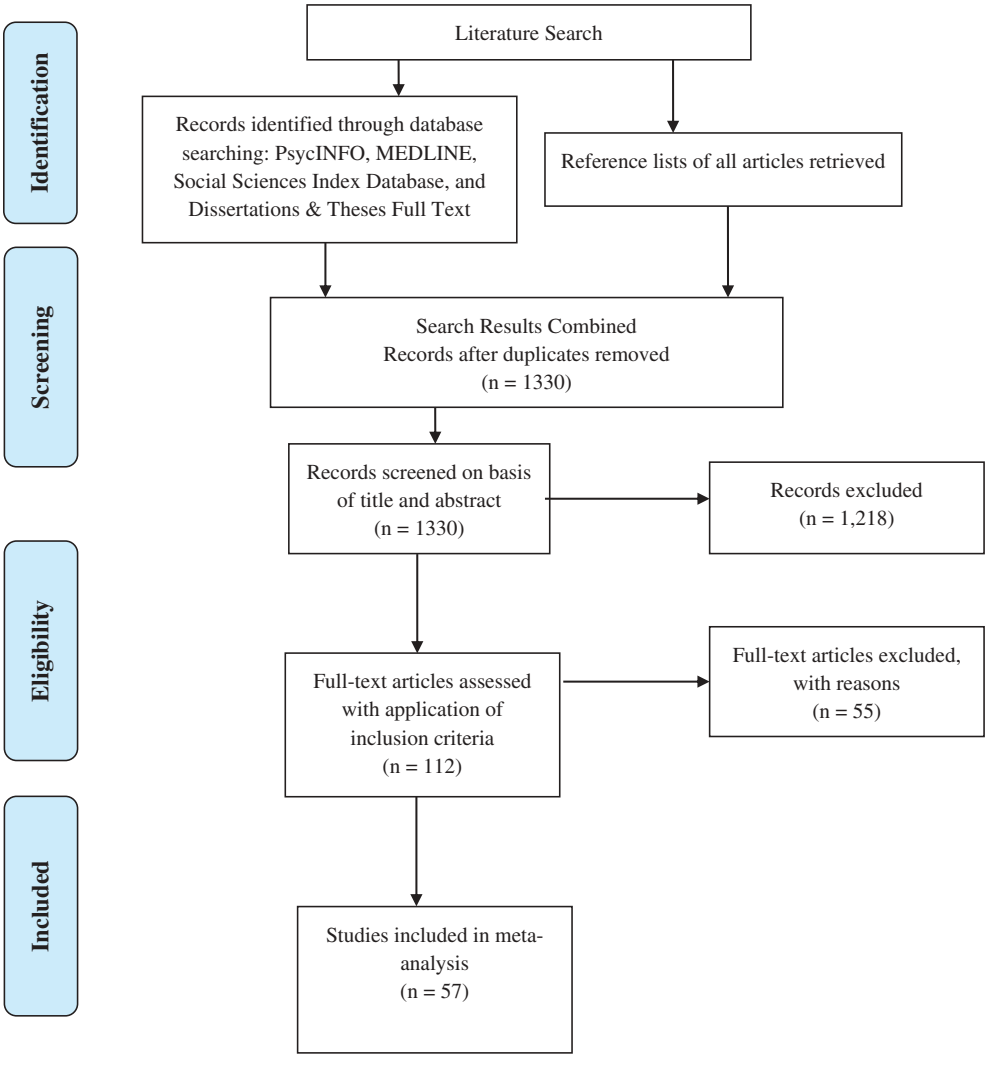

Figure 1. PRISMA flow diagram.

samples. We implemented the following protocol to include a single effect size per sample when multiple effect sizes were available within a study.

(1) In some cases, authors reported separate scores for mother and father as well as combined scores across parental figures.
   (a) For the analysis of the SS and developmental correlates, studies presented effect sizes for both combined mothers and fathers, or separately for mothers and fathers. To avoid the meta-analytic issue of using overlapping samples, and consistent with other meta-analyses (e.g. Madigan et al., 2016), we pooled effect sizes for mothers and fathers. When security with only one parent was evaluated, or when a study selected to combine attachment figures into one combined score, these scores were retained.

Table 1. Characteristics of studies included in meta-analyses.

Study	*N*	Age (mos)	Study design	Parent M/F	Types of analyses	Type of DC
Abraham and Kerns (2013)[a]	106	124	C	M	DC	EC, PS
Al-Yagon (2010)[a]	205	120	C	M	DC	SE
Al-Yagon (2015)[a]	369	191	C	M	DC	INT, EXT
Bacro (2012)[a]	122	116	C	M/F	DC	SA
Bauminger, Solomon, and Rogers (2010)[a]	164	122	C	M	DC, OA	PS
Bender, Sømhovd, Pons, Reinholdt-Dunne, and Esbjørn (2015)[a]	673	126	C	M/F	DC	EC, INT
Boldt, Kochanska, Yoon, and Koenig Nordling (2014)[a]	87	100	L	M/F	DC	PS
Booth-Laforce et al. (2006)[a]	73	123	C	M	DC	SE
Bystritsky (1999)	62	144, 156	L	M	DC, S	EXT, INT, SE
Chang (2007)	84	134	C	M	DC	INT
Colman (2002)	125	126	C	M	DC	PS
DeBoard-Lucas, Fosco, Raynor, and Grych (2010)[a]	150	120	C	M/F	DC, CS	EXT, INT
De Minzi (2006)[a]	716	124	C	M/F	DC, CS	INT, PS, SA
De Minzi (2007)[ab]	40	72	C	M/F	DC, CS	EC, PS
Diener, Isabella, Behunin, and Wong (2007)[a]	126	101	C	M/F	DC	PS, SA
Doyle, Markiewicz, Brendgen, Lieberman, and Voss (2000)[a]	216	138	C	M/F	DC	PS, SE, SA
Duchesne and Ratelle (2014)[a]	416	142	C	M/F	DC	INT, SA
Dwyer et al. (2010)[a]	223	137	C	M/F	DC	PS
Feres (2010)	282	126	L	M	DC	INT
Fosco (2008)	150	120	C	M/F	DC, CS	EC
Frey (2004)	39	99	C	M/F	DC	EXT, INT, PS
Granot and Mayseless (2001)	113	124	C	M	DC, OA	EC, SA, INT, EXT
Goldner & Sharf (2013)[a]	247	116	C	M	DC	EXT, INT, PS, SE
Harold, Shelton, Goeke-Morey, and Cummings (2004)[a]	181	139.8	L	M/F	DC	EC, EXT, INT
Isabella and Diener (2010)[a]	126	101	C	M/F	DC	INT
Jagadeesan (2012)	683	125	C	M	DC	PS
Jager, Yuen, Putnick, Hendricks, and Bornstein (2015)[a]	190	167	C	M/F	DC	EXT, INT, PS
James (2009)	101	116	C	M/F	DC	EXT, INT
Kendrick (2008)	11	123	C	M	DC	PS
Kerns et al. (1996)[a]	76	108	C	M	DC, S	PS, SA, SE
Kerns et al. (2000)[a]	176, 79	122	C, L	M/F	OA, S	
Kerns et al. (2007)[a]	52	126	C	M	DC, OA	EC
Kerns, Brumariu, et al. (2011)[a]	87	136	C	M	DC, OA	INT
Kerns, Siener, et al. (2011)[a]	1364	126	L	M	DC	INT
Kerns et al. (2015)[a]	88, 107	161,144	L,C	M/F	DC, CS, OA	EC, INT, SA, PS
Kim and Page (2013)[a]	74	109	C	PC	DC, OA	EC, EXT, PS
Kim, Sharp, and Carbone (2014)[a]	228	185	C	M/F	DC	EC
Kochanska, Brock, Chen, Aksan, and Anderson (2015)	102, 101	100, 123	L	M/F	DC	EXT
Korbel (2009)	100	162	C	M	DC, CS	EC
Kovacs (2010)	90	126	C	M	DC	INT, SE
Lemieux (2005)	103	152	C	M/F	DC	PS, SE
Nunes, Faraco, Vieira, and Rubin (2013)[a]	289	126	C	M/F	DC	EXT, INT
Parent-Boursier and Hébert (2015)[a]	142, 289	97	C	M/F	DC	EXT, INT, PS
Polasaari et al. (2013)[a]	240	137	C	M/F	DC	EXT, INT
Psouni and Apetroaia (2014)[a]	120	121	C	M/F	OA	
Sarracino, Presaghi, Degni, and Innamorati (2011)[a]	169	142	C	M/F	DC	EXT
Schwarz, Stutz, and Ledermann (2012)[a]	180	127	L	M	DC	EC, PS
Seibert (2009)	1140	126	L	M	DC, OA	EC, PS

(*Continued*)

Table 1. (Continued).

Study	*N*	Age (mos)	Study design	Parent M/F	Types of analyses	Type of DC
Sümer and Kağitçibaşi (2010)[ab]	797	129	C	M/F	CS	
Talley (2000)	108	138	C	M/F	DC, OA	PS, SE
Thornback (2010)	36	117	L	M/F	DC, S	EXT, INT
Traeden (2013)	126, 60	100, 208	L	M/F	DC	SE
Van Ryzin and Leve (2012)[a]	373	168	C	M	OA	
Venta, Mellick, Schatte, and Sharp (2014)[a]	133	176	C	M	DC	INT
Venta, Shmueli-Goetz, & Sharp (2014)[a]	194	168	C	M/F	OA	
Verschueren and Marcoen (2002)[a]	216	108	C	M/F	DC	EXT, INT
Williams and Kelly (2005)[a]	116	150	C	M/F	DC, CS	EXT, INT

[a]Published study.
[b]Book chapter.
In the cases of longitudinal studies, only N's and ages for time points when the Security Scale was assessed are included.
In cases when only grades (or age or grade ranges) instead of ages were provided, an estimate based on average age for that grade (or grade range) is provided
M: Mother; F: Father; M/F: both mother or father; SA: cchool adjustment; EC: emotional competence; PS: peer cocial competence; INT: internalizing; EXT: externalizing; SE: self-esteem; S: stability; OA: other attachment; DC: developmental correlate; CS: caregiver sensitivity; C: cross-sectional; L: longitudinal.

(b) For the analyses on the stability of the SS and the association between the SS and parental sensitivity, when both mother and father security scores were presented (i.e. child–mother, child–father attachment), the scores were entered separately into analyses as this was deemed conceptually appropriate (e.g. one caregiver's behavior will predict security with the same caregiver and not with the other).

(2) If a study presented both concurrent and longitudinal associations between attachment and developmental or caregiver correlates, we selected the most temporally distant measure of behavior problems to maximize longitudinal research in our meta-analyses and effectively assess how time between assessments may moderate associations.

(3) If there were multiple types of measures of the same developmental outcome category at one time point, they were aggregated into one effect size (e.g. if one study had two externalizing variables).

Coding of studies

The following variables were extracted for all studies using a standard coding protocol.

Child sex

Child sex was coded as the percent of males in each sample.

Geographical location

A six-category variable was created for geographical location: (a) North America, (b) Europe, (c) South America, (d) Australia, (e) Asia, and (f) Africa. Three categories, North America, Europe, and Asia, were retained for analyses due to low numbers of the other two categories.

Socioeconomic status

All studies provided indices of SES either explicitly through quantitative methods (e.g. statement of low, middle, or upper SES; sample income average) or less directly (e.g. education levels), although the former was more often provided. Based on this information, SES was represented categorically in one of three groups: (a) low SES, (b) middle to upper SES, or (c) mixed SES.

Time between assessments

Measured in months, time between assessments was calculated by subtracting the second time point from the first.

Study design

Study design was coded as either cross-sectional or longitudinal.

Publication status

Publication status was coded as published or unpublished (i.e. dissertation).

Child age

The majority of studies provided the mean age of study participants. In cases where the mean age was not directly provided, we estimated age using valid indicators (e.g. range, median age), at every time point that was provided (e.g. T1 and T2 for stability analyses).

Attachment measurement

For the analysis on the SS and other attachment measures, we extracted data on the other attachment measures as follows: behavioral measures (e.g. the Strange Situation Procedure), questionnaire measures (Inventory of Parent and Peer Attachment, IPPA, Armsden & Greenberg, 1987; the Coping Strategies Questionnaire; Finnegan, Hodges, & Perry, 1996), and representational measures (story-stem/interview measures; e.g. Child Attachment Interview, Shmueli-Goetz et al., 2008; Friends and Family Interview, Kriss et al., 2012; the Separation Anxiety Test, SAT).

Caregiver behavior

Studies examining one of the following: sensitivity, acceptance, or involvement (e.g. positive engagement and warmth) were included in the caregiver "sensitivity" analysis as each construct captures sensitive caregiving to some extent.

Developmental correlates of the SS

The developmental correlates categories were originally coded across eight categories: school adaptation, emotional competence, peer relations/competence, self-esteem, internalizing problems, externalizing problems, temperament, and cognition (e.g. IQ). There were too few studies ($n < 3$) examining associations between the SS and child temperament or cognition; thus, they were eliminated from analyses.

One graduate student coded all studies. A random sample of 18% of the articles was double coded by a second graduate student to calculate agreement. Agreement for categorical variables was calculated using percentages, since kappa is not reliable with less than 50 studies (Card, 2012). The agreement between the two coders ranged

between .80 and .95 for the main study variables. Inter-rater reliability of the data extraction of moderators ranged between .75 and 1, with intra-class correlations for continuous moderators ranging from .99 (sex) to 1 (age). Disagreements were addressed by reevaluation of the data and consensus coding.

Data analyses

Computation of effect sizes

Comprehensive Meta-Analysis (CMA, version 3.0; Borenstein, Hedges, Higgins, & Rothstein, 2014) was used for the computation of effect sizes and moderator analyses. All effect sizes were transformed into correlations for the purpose of reporting mean effect sizes, with 95% confidence intervals (CI) around the mean also reported. Effect sizes were calculated directly from information provided in each study.

Analytic approach

Calculations were based on a random effects model. In random effects models, the consideration is made that each study has its own population parameters (Rosenthal, 1995). For our purposes, random effects models reflect the heterogeneity inherent in psychological measures, assisting us in deriving non-inflated alpha levels (Hedges & Olkin, 1986).

Publication bias

Precautions were taken to ensure comprehensive inclusion of published and unpublished studies, namely through a dissertation literature search. However, as an additional method to test and, if needed, correct for publication bias, Duval and Tweedie's (2000) trim-and-fill algorithm was used, including an examination of funnel plots. Funnel plots show the association between sample size and effect size, where an inverted funnel with symmetrically distributed effect sizes around the combined effect size indicates no publication bias. However, publication bias may be indicated if fewer studies than expected fall along the bottom left of the mean effect size. In cases where more studies with small effect sizes fall to the right of the mean, the funnel plot is considered asymmetrical and, through the trim-and-fill procedure, symmetrical values are imputed to balance the funnel plot.

Moderator analyses

We assessed for overall heterogeneity of the mean effect size using the *Q* statistic, a test of the null hypothesis that all studies share a common effect size (Borenstein, Hedges, Higgins, & Rothstein, 2009). Categorical moderator analyses were conducted using *Q* statistics (Borenstein et al., 2014), whereas the significance of each continuous moderator was assessed using meta-regressions (Thompson & Higgins, 2002). We performed moderator analyses only when there were at least three studies at each level of the moderator. The following moderators were tested: child age and sex (% male), time between assessments, study design, SES, geographical location, and publication status. Child age and gender were examined across all meta-analyses, and the additional moderators were analyzed if there were sufficient studies at each level of the moderator.

Table 2. Summary of effect sizes across all meta-analyses.

Meta-analysis	k	N	r	95% CI	Homogeneity Q	P-value	Significant moderators
Stability over time	5	239	.51	.34–.71	22.66	.01	Time between assessments
Association with other attachment measures	12	2523	.29	.18–.43	141.63	.001	Measurement type
Association with caregiving behaviors							
Maternal sensitivity	7	2041	.45	.30–.59	81.41	.001	Child age and sex
Paternal sensitivity	6	1674	.28	.10–.44	68.60	.001	n/a
Association with developmental outcomes							
School adaptation	8	2090	.25	.21–.29	5.17	n.s.	n/a
Emotional vompetence	14	3222	.17	.12–.22	22.87	.05	Publication status
Peer social competence	21	4924	.20	.14–26	70.33	.001	Publication status; SES
Self-esteem	10	1224	.31	.20–.40	32.63	.001	Publication status
Internalizing	28	6493	–.23	-.17 to -.29	140.35	.001	Child age; SES
Externalizing	18	2527	–.19	-.15 to -.23	27.47	.050	SES

k = number of samples
*$p < .05$

Results

A summary of all meta-analytic results can be found in Table 2.

Security Scale: stability over time

Specific study characteristics

There were five studies ($N = 239$) that examined the stability of the SS over time. The average age at the first and second assessments of security was 9.68 and 11.36 years, respectively. On average, there were 20 months between the first and second assessments of attachment using the SS.

Meta-analysis

The combined effect size was significant, $r = .51$ (95% *CI*: .34-.71) (see Supplemental Figure 1). There was no indication of publication bias. The *Q* statistic ($Q = 22.66$, $p < .01$) indicated significant heterogeneity of effect sizes, and moderator analyses were conducted to explain this variability. Given the limited sample size, only continuous moderators were explored, including child age, sex (% male), and the time between assessments. Time between assessments emerged as significant moderators: effect sizes decreased as the duration of time between assessments increased ($b = –.02$; $p < .0001$). Child ages at Time 1 ($b = .08$; $p = .15$) and Time 2 ($b = .002$; $p = .86$), as well as child sex ($b = -.31$; $p = .72$) were not significant moderators.

Security Scale: association with other attachment measures

Specific study characteristics

There were 12 studies examining associations between security as assessed on the SS, and security assessed on another attachment measure, including representational ($k = 7$) questionnaire ($k = 4$) and observational measures ($k = 1$). Seven studies were cross-sectional and four studies were longitudinal.

Table 3. Moderator analyses of the association between the Security Scale and other attachment measures.

Categorical moderators	k	r	95% CI	Homogeneity Q	P-value
Measurement method				15.62	.001
Questionnaire	4	.52*	.40–.62		
Representational	7	.18*	.07–.29		
Study design				.10	.75
Cross-sectional	8	.27*	.12–.41		
Longitudinal	4	.33	-.02–.61		
Continuous moderators	**k**	***b***	**Standard error**	**Z-value**	**P-value**
Sex (% male)	12	.009	.006	1.60	.11
Child Age Security Scale	12	.000	.004	0.01	.99
Child Age Other Measure	11	.001	.003	0.19	.85
Time between assessments	11	.003	.007	0.40	.70

k = number of samples
*$p < .05$

Meta-analysis

The combined effect size across 12 studies ($N = 2523$) was significant, $r = .29$ (95% *CI*: .14-.43) (see Supplemental Figure 2). There was no indication of publication bias. The *Q* statistic ($Q = 141.63$, $p < .0001$) was significant and child age, sex, time between assessments, study design, and type of attachment measure (questionnaire versus representational) were examined as potential moderators. Only type of attachment measure emerged as a significant moderator, with higher effect sizes in studies that examined attachment using questionnaire ($k = 4$; $r = .52$; 95% *CI*: .40-.62) versus representational ($k = 7$; $r = .18$; 95% *CI*: .07-.29) measures. Results of the remaining nonsignificant moderators can be found in Table 3.

Security Scale: association with caregiving behaviors

Specific study characteristics

In total, there were seven studies ($N = 2041$) examining associations between security of attachment with mothers and maternal sensitivity, and six studies ($N = 1674$) reporting associations between security of attachment with fathers and paternal sensitivity. All but two studies were cross-sectional.

Meta-analysis: maternal sensitivity

The mean effect size for security of attachment with mothers and maternal sensitivity was significant ($k = 7$; $r = .45$; 95% *CI*: .30-.59) (see Supplemental Figure 3). There was no indication of publication bias. The *Q* statistic was significant ($Q = 81.41$, $p < .001$), and due to sample size restrictions, only child age and sex were explored as potential moderator of associations. Effect sizes varied as a function of the percentage of males in the sample ($b = -.10$; $p < .001$), with effect sizes decreasing as the percentage of males in the sample increased. Child age was a significant moderator ($b = .08$; $p < .01$), with effect sizes increasing as the child aged.

Meta-analysis: paternal sensitivity

The mean effect size for security of attachment with fathers and paternal sensitivity was significant (k = 6; r = .28; 95% *CI*: .10-.44) (see Supplemental Figure 4). There was no indication of publication bias. The Q statistic was significant (Q = 68.60; p < .001) and moderator analyses were explored; however, neither child age (b = .005; p = .51) nor sex (b = -.32; p = .49) emerged as significant moderators.

SS: association with developmental correlates

Specific study characteristics

Several developmental correlates were examined, including: school adjustment (k = 8, N = 2090); emotional competence (k = 14, N = 3222); peer social competence (k = 22, N = 4924); self-esteem (k = 10, N = 1224); internalizing behavior (k = 26, N = 6493); and externalizing behavior (k = 18, N = 2527).

Meta-analysis: school adaptation

The mean effect size for the association between security of attachment and school adaptation was significant (k = 8; r = .25; 95% *CI*: .21-.29) (see Supplemental Figure 5). There was no indication of publication bias. The Q statistic was not significant (Q = 5.17; p = *n.s.*); thus, moderator analyses were not explored.

Meta-analysis: emotional competence

The mean effect size for the association between security of attachment and emotional competence was significant (k = 14; r = .17; 95% *CI*: .12-.22) (see Supplemental Figure 6). There was no indication of publication bias. The Q statistic was significant (Q = 19.97; p < .05), and several moderators were explored, including publication status, child age, and sex. Effect sizes varied as a function of publication status, with larger effect sizes in published (k = 10; r = .21; 95% *CI*: .16-.25) versus unpublished (k = 3; r = .08; 95% *CI*: .02-.13) studies. Neither child age (b = .0002; p = .86) nor sex (b = .001; p = .62) emerged as significant moderators.

Meta-analysis: peer social competence

The mean effect size for the association between security of attachment and peer social competence was significant (k = 22; r = .20; 95% *CI*: .14–26) (see Supplemental Figure 7). There was no indication of publication bias. The Q statistic was significant (Q = 72.75; p < .001) and several moderators were explored, including publication status, child age and sex, and family SES (Table 4). Effect sizes varied as a function of publication status, with larger effect sizes in published (k = 14; r = .23; 95% *CI*: .18-.29) versus unpublished (k = 7; r = .11; 95% *CI*: .03-.19) studies. In addition, studies with children from middle/high socioeconomic groups (k = 4; r = .25; 95% *CI*: .13-.37) had higher effect sizes compared to those with low SES (k = 4; r = .06; 95% *CI*: .02-.11).

Meta-analysis: self-esteem

The mean effect size for the association between security of attachment and self-esteem was significant (k = 10; r = .31; 95% *CI*: .20-.40) (see Supplemental Figure 8). There was no indication of publication bias. The Q statistic was significant (Q = 32.63; p < .001) and several moderators were explored, including publication status, child age, and sex. Effect sizes

Table 4. Moderator analyses of the association between the Security Scale and social competence with peers.

Categorical moderators	k	r	95% CI	Homogeneity Q	P-value
Socioeconomic status				7.88	.01
Low	4	.06*	.02–.11		
Middle/upper	4	.25*	.13–.37		
Publication status				6.57	.01
Dissertation	7	.11*	.03–.19		
Published	14	.23*	.18–.29		
Continuous moderators	**k**	***b***	**Standard error**	**Z-value**	**P-value**
Sex (% male)	20	.001	.003	0.44	.66
Child Age Security Scale	20	.001	.002	0.40	.70
Child Age at Correlate	20	.001	.001	0.22	.82

k = number of samples
*$p < .05$

varied as a function of publication status, with larger effect sizes in published ($k = 5$; $r = .41$; 95% *CI*: .28-.53) versus unpublished ($k = 5$; $r = .19$; 95% *CI*: .06-.31) studies. Neither child age at either time point (*p*'s < .80) nor sex ($b = .001$; $p = .94$) were significant moderators.

Meta-analysis: internalizing behavior

The mean effect size for the association between security of attachment and internalizing behavior was significant ($k = 26$; $r = -.23$; 95% *CI*: -.17 to -.29) (see Supplemental Figure 9). There was no indication of publication bias. The *Q* statistic was significant ($Q = 140.35$; $p < .001$) and several moderators were explored, including publication status and geographical location, study design, child age and child sex, as well as family SES (see Table 5). Child age at both the assessment of attachment ($b = .003$; $p < .01$) and internalizing behavior ($b = .003$; $p < .001$) was significant in moderating effect sizes, with effect sizes increasing as child age increased. Moreover, studies with children from middle/high socioeconomic groups ($k = 10$; $r = .28$; 95% *CI*: .18-.39) had higher effect sizes compared to those with low SES ($k = 3$; $r = .14$; 95% *CI*: .05-.22).

Meta-analysis: externalizing behavior

The mean effect size for the association between security of attachment and externalizing behavior was significant ($k = 18$; $r = -.19$; 95% *CI*: -.15 to -.23) (see Supplemental Figure 10). There was no indication of publication bias. The *Q* statistic neared significance ($Q = 27.5$; $p < .05$); thus, moderator analyses were explored, including publication status and geographical location, study design, child age and child sex, as well as family SES (see Table 6). The only significant moderator was SES: studies with children from middle/high socioeconomic groups ($k = 8$; $r = .25$; 95% *CI*: .18-.33) had higher effect sizes compared to those with low SES ($k = 4$; $r = .13$; 95% *CI*: .05-.20).

Discussion

Reliance on psychometrically sound measures of attachment in middle childhood is essential for theory, research, and practice. Results of the current study provide support for the validity of the SS: the SS was moderately stable over time, correlated with other attachment measures, associated with parental sensitivity, and related to a diverse set of

Table 5. Moderator analyses of the association between the Security Scale and internalizing problems.

Categorical moderators	k	r	95% CI	Homogeneity Q	P-value
Socioeconomic status				4.25	.05
Low	3	.14*	.05–.22		
Middle/upper	10	.28*	.18–.39		
Geographical location				0.30	.86
Asia	4	.22*	.10–.34		
Europe	3	.21*	.03–.37		
North America	17	.22*	.15–.29		
Publication status				2.10	.15
Dissertation	7	.18*	.11–.25		
Published	18	.25*	.19–.32		
Study design				.16	.69
Cross-sectional	18	.24*	.17–.31		
Longitudinal	7	.21*	.10–.32		
Continuous moderators	**k**	***b***	**Standard error**	**Z-value**	**P-value**
Sex (% male)	27	−.002	.005	−0.49	.62
Child Age Security Scale	27	.003	.001	3.08	.01
Child Age at Correlate	24	.003	.001	3.49	.001

k = number of samples
*$p < .05$

Table 6. Moderator analyses of the association between the Security Scale and externalizing problems.

Categorical moderators	k	r	95% CI	Homogeneity Q	P-value
Socioeconomic status				4.59	.05
Low	4	.13*	.05–.20		
Middle/upper	8	.25*	.18–.33		
Geographical location				0.01	.99
Asia	4	.19*	.08–.30		
Europe	3	.18	-.04–.39		
North America	10	.19*	.11–.27		
Publication status				0.13	.72
Dissertation	4	.23*	−.02–.46		
Published	14	.19*	.14-.23		
Study design				2.11	.15
Cross-sectional	14	18*	.13–.22		
Longitudinal	4	.30*	.14–.45		
Continuous moderators	**k**	***b***	**Standard error**	**Z-value**	**P-value**
Sex (% male)	18	−.000	.004	−0.11	.92
Child Age Security Scale	16	.002	.001	1.56	.12
Child Age at Correlate	17	.001	.001	1.15	.25

k = number of samples
*$p < .05$

developmental correlates. Furthermore, some effect sizes varied as a function of SES and publication status, whereas geographical location and, for the most part, child sex and age did not emerge as significant moderators. These findings will be discussed in turn, followed by a consideration of study strengths, limitations, and future directions.

Stability of the Security Scale and its associations with other attachment measures

Results revealed that the SS shows moderate stability over time. The effect size (r = .51) is comparable to effect sizes reported in meta-analyses on the stability of attachment within childhood or from childhood to adolescence (r = .39, Fraley, 2002; r = .39, Pinquart et al., 2013). Although the SS was stable over time, it is important to note that there was a dilution of effect sizes as the time between assessments increased, consistent with the meta-analytic synthesis of attachment stability (Pinquart et al., 2013). This finding supports the notion that children's perceptions or representations of attachment are not rigid, but flexible in nature (e.g. Atkinson et al., 2000).

The magnitude of the association between the SS and other attachment measures is small to moderate. This finding is consistent with studies that have examined the correspondence between various measures of attachment (e.g. see Crowell et al., 1999; Kerns, Mathews, Koehn, Williams, & Siener-Ciesla, 2015; Solomon & George, 2016). Importantly, the type of attachment measure the SS was compared to was a significant moderator, with higher effect sizes in studies that examined attachment using questionnaire rather than representational measures. This finding has implication for how we conceptualize and operationalize attachment measures in middle childhood. While certainly higher effect sizes for questionnaire-based studies could be due to shared-method variance, this result is in line with the observation of Kerns, Tomich, Aspelmeier, and Contreras (2000) that one would not expect high levels of association between measurement approaches as they capture different constructs. Furthermore, Psouni and Apetroaia (2014, p.36) have suggested that a modest association between the SS and representational measures is expected, as attachment questionnaires measure conscious "specific, explicit representations of relationships," whereas interviews capture "more global, implicit and perhaps more automatic representations." Overall, our results converge with the idea advanced by Bosmans and Kerns (2015), based on the dual process theory, that questionnaires (capturing primarily strategic processes) and representational measures (reflecting primarily automatic processes) may not necessarily overlap highly. This finding is also in line with contemporary views of attachment in middle childhood, shifting the focus from the view that there must be one gold standard measurement strategy to asking what measures have in common (i.e. the secure base construct) and in what ways they may provide specific information about the attachment processes (Bosmans & Kerns, 2015). As shown here, the SS converges with other measures, while having unique variance.

Security Scale: relations with parental sensitivity and developmental correlates

In line with some previous meta-analytic findings focusing on early parental behavior and behavioral measures of attachment (Atkinson et al., 2000; De Wolff & Van IJzendoorn, 1997; Lucassen et al., 2011), results confirm a significant mean effect size for the relation between parental sensitivity and attachment in middle childhood. These results corroborate the idea that the SS shows evidence of validity; however, given the reliance on cross-sectional studies, the causal direction between these constructs cannot be established. As predicted based on theory, the SS was associated with children's developmental outcomes and adjustment, including school adaptation, emotional competence, peer social

competence, self-esteem, and behavioral problems. Results parallel in direction and magnitude those reported in other meta-analytic studies and reviews integrating findings regarding the link between parent–child attachment and children's competences and adjustment (e.g. Groh et al., 2014; Madigan et al., 2016; Pallini et al., 2014).

When evaluating the relation between the SS and peer social competence, internalizing problems, and externalizing problems, children from middle/high socioeconomic groups had higher effect sizes compared to those with low SES. Madigan et al. (2016) reported similar findings in their meta-analysis, and raised the question of whether the direction of effect for SES is due to children in higher SES environments having better developed language skills, which would assist in the completion of the self-report methodology. Furthermore, attachment security is one of the several factors that may affect children's functioning and behavioral problems (e.g. Brumariu & Kerns, 2010; DeKlyen & Greenberg, 2016), and SES is a strong correlate of adjustment, most likely due to its association with other risk factors (e.g. limited access to resources, at-risk neighborhood; e.g. Bradley & Corwyn, 2002). Thus, it is possible that attachment security assessed with the SS has more relevance in middle/high socioeconomic groups that are less exposed to other risks associated with poor adjustment (Madigan et al., 2016).

Effect sizes for the relation between the SS and emotional competence, peer social competence, and self-esteem, were higher in published versus unpublished studies. Unpublished studies might have weaker effect sizes by comparison because they are of lower quality (which also might be why the studies are unpublished). Including a large number of lower-quality studies in a meta-analysis may not ultimately benefit the field if it leads to an underestimation of effect sizes (Ferguson & Brannick, 2012). Our findings highlight the need to further study the benefits and costs of different inclusion criteria for searches, including how those criteria are related to the quality of studies included in an analysis.

Security Scale: child sex, age, and geographical location

We further evaluated whether relations of security assessed with the SS is independent of child sex. In all but one analysis, sex did not moderate associations. The only analysis for which sex emerged as a significant moderator was for the association between maternal sensitivity and SS, where effect sizes increased as the percentage of female in the sample increased. One potential explanation for these findings stems from possible subtle differences in behaviors between mother–daughter and mother–son dyads, particularly those related to emotions (e.g. Klimes- Dougan et al., 2007), a central concept in attachment theory. For example, mothers elaborate more about emotions and are more likely to talk about regulating negative emotions with daughters than with sons (see Fivush, 2007, for a review). In turn, girls are more likely to discuss emotional aspects of their lives compared to boys (Fivush, Brotman, Buckner, &Goodman, 2000). These finding suggest that mother–daughter pairs might engage in more frequent discussions of emotion-related events, and these shared exchanges might promote the quality of the attachment relationship. Notably, relations of the SS with developmental outcomes did not vary based on child sex, and these results complement meta-

analytic findings showing that sex is not a consistent moderator of the relations between attachment security and child's adjustment (e.g. Madigan et al., 2013, 2016).

Furthermore, age emerged as a significant moderator in two analyses. Specifically, the effect sizes of the relation between maternal sensitivity and the SS increased as the child aged, mirroring some earlier meta-analytic outcomes showing that maternal sensitivity and attachment security are more strongly associated in older infants than in younger infants (De Wolff & Van IJzendoorn, 1997). In addition, the association of the SS with child's internalizing problems was stronger when the child was older at the time of assessment of both attachment security and internalizing problems. There are possible explanations for this finding. First, rates of internalizing problems rise later in development (e.g. Kendall, Hedtke, & Aschenbrand, 2006), and risk and protective factors, including attachment, might have a differential impact at various times in development (DeKlyen & Greenberg, 2016; Kerns & Brumariu, 2014). Second, Bowlby (1969) speculated that internal working models become more stable as the child ages, and children included in this meta-analysis were between the early stages of middle childhood and early adolescence. During this time, children's cognitive sophistication and emotional awareness enhance significantly (Saarni, 1999), and therefore, older children may have greater capacity and accuracy for self-reporting their emotions and symptomatology. Indeed, the SS was specifically designed to assess attachment in children older than 8 years of age, a time when children show increased competencies for self-reflection on relationships and thus may be better able to answer the SS items in a meaningful way. To clarify whether the age effect is due to increased validity of the SS or to age changes in the association between attachment and internalizing symptoms, future studies should include multiple measures of attachment that employ different methods (e.g. representational as well as questionnaires) across ages. Importantly, even though the measure was originally developed for 8–12-year-old children, overall, the relations of the SS with constructs of interest were similar across ages, including early adolescence, suggesting that the SS is also a valid measure of security at this developmental period.

Bowlby (1969) clearly articulated that attachment is a universal phenomenon, and empirical evidence at younger and older ages supports this claim (e.g. Mesman, Van IJzendoorn, & Sagi-Schwartz, 2016; van IJzendoorn, Bakermans-Kranenburg, 2010). Owing to sample size restrictions, we were able to test this claim only by examining geographic location as a moderator of associations between the SS and internalizing and externalizing problems. Findings from the current study point out that the relations of the SS with internalizing and externalizing problems are similar across Asia, Europe, and North America, providing some evidence for the cross-cultural validity of the SS.

Strengths, limitations, and future directions

In the last 15 years, research focused on middle childhood attachment has expanded rapidly and has provided undeniable insights into the core features and sequelae of attachment during this developmental period (Bosmans & Kerns, 2015; Kerns & Brumariu, 2016). The development of a range of measures to assess middle childhood attachment most likely contributed to this surge, and investigating the validity of specific measures is a key step in the process of further elucidating the nature and consequences of attachment in middle childhood. Our study represents a substantive

evaluation of the psychometric properties of the SS, including its stability and construct validity. Results demonstrate the relevance of the SS for attachment research.

Several limitations of our meta-analysis should be noted. First, although for the most part there were enough studies to assess correlates of the SS, only a small sample of studies has examined the SS's stability and its relation with parental sensitivity. Furthermore, some categories had a relatively low number of studies, and this precluded extensive analyses of moderator variables. For example, an important avenue for attachment research in general, and the SS in particular, would be whether studies in underrepresented geographical regions (e.g. Africa) can also effectively evaluate the universality of attachment. Second, most studies used a cross-sectional rather than a longitudinal design. Thus, causality, at the individual study level as well as in meta-analysis, cannot be inferred. Third, studies vary as to whether they assessed security with both father and mother, or only one parent. To be consistent with previous meta-analytic reports, when studies reported the relation between the SS and a developmental correlate separately for mothers and fathers, we averaged the scores of their associations with other constructs. Thus, the results (with the exception of the SS stability and associations with caregiver sensitivity) reflect attachment security with parents primarily rather than mother or father separately. Quality of attachment with each parent may play a differential role in children's development and adjustment (e.g. attachment with fathers may have a dominant role for development of social competence with peers, whereas the attachment with mother may be primarily important for emotional competence; Steele & Steele, 2005). Owing to methodological difficulties (i.e. overlapping samples), we did not assess this possibility. Nonetheless, research endeavors should further clarify whether there are differences in the associations of attachment with each parent measured with the SS.

Measure validation is often a complex and continuous process. We evaluated the SS in relation to key attachment-focused constructs. However, attachment theory provides a wider framework for evaluating the construct validity of a measure. For example, our findings regarding the relation between the SS and parental sensitivity, along with the previous literature (De Wolff & Van IJzendoorn, 1997; Verhage et al., 2016), suggest that other key parental behaviors may contribute to the development of attachment security. Negative and harsh parental behaviors that fail to take in account the child's perspective, and preclude open communication and a collaborative alliance between the child and a wiser caregiver, are likely to affect the development of a secure attachment. In addition, controlling parenting is likely to relate to the SS security (and security assessed with other measurement strategies), as this type of parenting is likely to impede children's increased autonomy and reliance on parental availability, key characteristics of attachment in middle childhood (Kerns & Brumariu, 2016). Whereas the current meta-analysis could not address these questions due to limited studies assessing these constructs, future studies should evaluate how a larger repertoire of caregiving behaviors is associated with the SS security.

Relatedly, Kerns, Brumariu, et al. (2011) proposed that a valid measure of attachment should not simply correlate with all things "good." There has not been sufficient attention to testing the discriminant validity of the SS, and our ability to evaluate the discriminant validity of the SS was limited. For example, although we initially coded for studies that assessed temperament, there were too few identified to analyze. Thus,

studies of discriminant validity (e.g. evaluating whether the SS is not associated with constructs such as athletic competence) would add to the literature.

The current endeavor is not only timely, but also crucial, given the possible validity concerns related to potential difficulties assessing internal working models of attachment consciously through self-report, as well as the potential for response biases and social desirability to influence any questionnaire responses (Kerns et al., 1996; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). We also want to offer the caveat that the SS provides one way to capture individual differences in security, specifically, that it taps children's cognitively available beliefs about the attachment figure that the child can verbalize. We would therefore echo recommendations of others (e.g. Kerns et al., 1996) that studies using the SS employ other sources and methods whenever possible. This recommendation is also in line with recent suggestions to follow a comprehensive approach on attachment research measures, such as combining different measurement strategies, which would deepen our knowledge of both the meaning of attachment measures and of attachment correlates (Bosmans & Kerns, 2015).

Concluding remarks

In summary, the SS shows moderate stability and meaningful associations with other attachment measures, caregiver sensitivity, and indexes of child's adjustment. Furthermore, some of its associations with child's outcomes hold regardless of the child's sex and age as well as geographical location of studies. Overall, findings demonstrate the relevance of the SS for middle childhood and early adolescence attachment research and its role in developing a more subtle and improved understanding of attachment-related outcomes.

Note

1. When studies did not report sufficient information for the calculation of an effect size (e.g. no means, SDs, correlations, etc., and/or if authors only reported effect sizes for subscales of a particular attachment measure), the corresponding authors (n = 19) were contacted, but only five (26%) were able to provide the necessary statistics and the remaining studies were excluded.

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