Associations Between Attachment Security and Social Competence in Preschool Children

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Attachment theorists suggest that attachment security with parents supports the quality of social adaptation in peer groups during early childhood, and numerous studies supporting this conjecture have been published. Most of these studies used enacted representations rather than mental representations of attachment security, and most studies examining mental representations used adult (parent or teacher) ratings of peer-group adaptation. Our study tested relations between preschool children's (N = 147; age 48–69 months) mental representations of attachment by using the Attachment Story Completion Task and child-level indicators of social competence based on direct observations and sociometric interviews. General intelligence tests were administered to control for effects of developmental level on child narrative production. Analyses revealed positive, significant associations between attachment measures and all social competence composites. Children with more secure attachment representations were more socially engaged and more likely to exhibit social, emotional, and cognitive skills that contribute to peer acceptance. Results support the hypothesis that attachment security is a foundational support for peer social competence.

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The notion that attachment relationships coconstructed during the early years of life serve as guides or templates for the child's subsequent relationships with peers and that security in attachment relationships supports the child's positive social adaptation in children's peer groups has a long history in developmental research and theory (e.g., Bost, Vaughn, Washington, Cielinski, & Bradbard, 1998; Bowlby, 1973, 1969/1982; Lieberman, 1977; Park & Waters, 1989; Rose-Krasnor, Rubin, Booth, & Coplan, 1996; E. Waters & Sroufe, 1983). John Bowlby (e.g., 1973) argued that the mechanisms mediating relations between early attachment security and later adaptive functioning were internal (mental) working models of the attachment figure, the self, and the self in relation to others that reflected the interaction history of the child and the attachment figure during the early years of life. These internal models were thought to guide behavior in subsequent close relationships (e.g., Treboux, Crowell, & Waters, 2004), to inform the child's beliefs about his/her personal qualities and attributes (e.g., Elicker, Englund, & Sroufe, 1992), and shape the child's expectations about how others might respond to his or her social initiations (e.g., Booth, Rubin, & Rose-Krasnor, 1998).

By and large, studies examining links between attachment security and aspects of adaptation in childhood have yielded positive results. Children with secure attachments, whether assessed in infancy/toddlerhood or concurrently with peer-group assessments, tend to be advantaged in comparison to children with insecure attachments in terms of the quality of their peer interactions and relationships in early childhood (e.g., Barglow, Contreras, Kavesh, & Vaughn, 1998; LaFreniere & Sroufe, 1985; Sroufe, 1983; Szewczyk-Sokolowski, Bost, & Wainright, 2005; E. Waters, Wippman, & Sroufe, 1979) and with respect to social competence more generally (Arend, Gove, & Sroufe, 1979; Bost et al., 1998; Lieberman, 1977; Rose-Krasnor et al., 1996; Veríssimo et al., 2011; Verschueren & Marcoen, 1999). Nevertheless, associations between early attachment security and childhood outcomes were often rather modest, dependent on the age(s) of the child when attachment and/or later social adaptation measures were obtained, and significant associations were often moderated or mediated by intervening variables (e.g., McElwain, Booth-LaForce, Lansford, Wu, & Dyer, 2008; Turner, 1991). Schneider, Atkinson, and Tardif (2001) reported a meta-analysis of 63 studies, published prior to 1998, in which they found the global effect size (ES) for infant/toddler attachment security on subsequent social outcomes to be .20. The global ES was moderated by (among other things) child age at the time of social adaptation assessments. The ES was smaller for children under 8 years of age (59 samples, mean ES = .17) than for children older than 8 (16 samples, mean ES = .26)

when social adaptation was assessed, and the difference between effect sizes was statistically significant.

There are several possible reasons why it might be that the effects of attachment security on aspects of child functioning in the peer group appear to be modest. Firstly, most of these studies used enacted representations (e.g., Strange Situation classifications, Attachment Q-sort scores) rather than mental representations (e.g., Attachment Story Completion Task) to index attachment security, and the correspondence between the organization of attachment behavior and properties of internal working models, while significant, is far from perfect during early childhood (e.g., Bretherton, Ridgeway, & Cassidy, 1990; Wong et al., 2011). Enacted representations are sensorimotor schemes insofar as they are the primary means of expressing the child's knowledge of caregiver behavior, but that knowledge may be activated only when the patterns of behavior are elicited (e.g., by being separated from an attachment figure). Bowlby (e.g., 1973) argued that the internal working models emergent from these sensorimotor representations are more readily available and accessible to the (older) child and that these internal models can be activated by words and thoughts about the attachment figure, even when that individual is not physically present. Consequently, it is plausible to speculate that enacted and mental representation measures would have different patterns of associations with social adaptation outcomes in early childhood.

Secondly, even when mental representations of attachment were assessed in prior studies (e.g., Page & Bretherton, 2001; Rydell, Bohlin, & Thorell, 2005; Verschueren & Marcoen, 1999), peer-relationship qualities and/or social competence outcomes were most often measured indirectly (i.e., by questionnaire items rated by parents or teachers) rather than by direct observations and/or interviews with children. Indirect measures have their own disadvantages, including the frequently observed finding that different adult informants (e.g., parent vs. teacher) do not agree much about child behavior, even when using the same set of items during the same developmental period (e.g., Renk & Phares, 2004). In this study, we used a measure of children's mental representations (i.e., the Attachment Story Completion Task [ASCT; Bretherton et al., 1990]) and direct observational assessments of child behaviors and social preferences (i.e., the battery of social competence assessments described and validated by Vaughn et al. [2009]) to determine whether this would increase the magnitudes of associations observed.

E. Waters and Sroufe (1983) suggested a third rationale for expecting modest associations between attachment measures and outcome assessments over time. They argued that attachment is the central organizational

construct of infancy (Sroufe & Waters, 1977) insofar as coconstructing an attachment relationship is the primary social/emotional task and challenge the child faces during infancy/toddlerhood. They further suggested that a secure attachment relationship should be considered as the best single index of competence for infants and toddlers because security implies that the child is able to flexibly exercise behavior, affect, and cognition in the service of achieving developmentally salient goals. Similarly, they argued that effectiveness in achieving salient personal goals in support of good developmental outcomes in social contexts was the best single index of competence during the preschool period. Thus, attachment and social competence in the peer group are related conceptually because each construct indexes personal effectiveness, and both are expected to be related empirically, to a degree, because both developmental tasks tax the same underlying capacities of the child (i.e., using available personal and environmental resources to achieve a good developmental outcome) at different age periods. However, both constructs are themselves very broad in terms of the domains of affect, behavior, and cognition that are integrated in the service of being effective, and both require *broadband measurement* (i.e., indicators that capture the many facets of social success simultaneously) for adequate assessment of individual differences. That is, no single temperament/personality trait or behavioral attribute can adequately capture what it means for a child to be securely attached or socially competent with peers.

Consequently, when social behaviors or relationship statuses subsequent to attachment construction and maintenance are assessed by using specific skills/behaviors in specified domains (e.g., disruptive behavior, group entry, self-esteem, perceived acceptance, numbers of reciprocated friendships), relations with attachment security are expected to be in the modest-to-moderate range. More substantial associations are likely only when broadband measures are used to assess children's social adaptation. In the present study, preschoolers' social competence was assessed by using indicators for three relatively broad domains described by Vaughn et al. (2009): social engagement/motivation, profiles of behavioral and psychological attributes from Q-sort descriptions, and peer acceptance. Previous studies show that these indicators are coherent within domain and are explained by a single latent social competence dimension (Bost et al., 1998; Santos, Peceguina, Daniel, Shin, Vaughn, 2013; Vaughn et al., 2009). The latent structure of the indicators is stable over consecutive years of preschool, and child social competence in Year 1 predicted increases in teachers' ratings of children's adjustment to school in Year 2 (Shin et al., 2011). The principle of aggregation (Rushton, Brainerd, & Pressley, 1983) suggests that the composite social competence variable will be correlated with

our attachment indicator at a greater magnitude than any of the subdomain composites and that each of the first-level measures will have associations of greater magnitude than the average reported by Schneider et al. (2001) for preschool-age children. (That is, most of the studies they reviewed did not use composite measures for either attachment or social competence outcomes.)

Data for this study come from an ongoing, large-scale, binational (Portugal and the United States) study of social competence, affect experience, and social/emotional relationships during early childhood. Assessment protocols were fully overlapping for the attachment and social competence constructs reported here, and previous research with these assessment protocols (e.g., Vaughn et al., 2009; Wong et al., 2011) has demonstrated their structural similarity and equivalence in terms of external correlates across these two sociocultural groups. Therefore, the two samples were combined for the purposes of this report. To our knowledge, this is the first report to link mental representations of attachment with direct assessments of children's social competence during early childhood. It is also the first to explicitly test the assumptions regarding the necessity of using broadband assessments to examine continuity of adaptation, as articulated in the E. Waters and Sroufe (1983) model.

Method

Participants

Participants were 147 preschool children (29 from the United States and 118 from Portugal; 71 boys and 76 girls). Families were recruited when their children were between the ages of 2 and 3 ($M = 3.14$, $SD = .68$) to an ongoing longitudinal project. However, all measures used in the present study were obtained when the children were 4–5 years old. Mothers ranged in age from 27 to 44 ($M = 35.57$, $SD = 4.07$). The majority of mothers in each sample had earned a university degree or certification, and income levels for most families were well above the median for their communities.

Procedures

Informed consent was obtained from all the participating families when they were recruited to the study. Participating children were interviewed with the ASCT at their child-care facility during the winter academic term (in January through March). Behavior observations and sociometric interviews were collected in October through April of the academic year.

A minimum of 90% of children were observed in each classroom both in Portugal and the United States.

Measures

Attachment representations. The ASCT was used to assess children's symbolic attachment representations. A series of story stems were presented to the child to elicit narratives regarding attachment behaviors toward caregivers. Story stems were presented by using dolls and household props, including a mother, father, child, sibling, a pet dog, kitchen equipment, living room and bedroom furniture, etc. The child doll was the same gender and ethnicity as the child being assessed. The assessments took place in a quiet area outside the classroom or in the classroom at a time when other children were elsewhere. The interviewer invited the child to play the story-completion game together, with the interviewer beginning each story and the child finishing the story. The child was first presented with a story stem about a birthday party with a pleasant but non-attachment-related theme. This warm-up story was not scored for attachment variables. The child was then presented with the five primary attachment-related story stems (e.g., parents leave for an overnight trip while the child and a sibling stay at home with an aunt) and asked to "show me and tell me what happens next." Nondirective questions such as "Does anything else happen in the story?" or "What are they doing?" were used to facilitate the child's narrative production. The story was completed when the child indicated that he or she was finished.

All stories were rated independently by two trained coders, who were blind to any other information about the child, on 8-point scales relevant to attachment security (e.g., Golby, Bretherton, Winn, & Page 1995; Heller, 2000; Page & Bretherton, 1993; Robinson, Mantz-Simmons, Macfie, & the MacArthur Narrative Working Group, 1992). The scales comprise a comprehensive coding system that includes identification of general and summary themes (e.g., prosocial, obedience/discipline, aggression, danger), a broader assessment of narrative elements (e.g., parental representations, type of story resolution), and relevant performative elements (e.g., overall emotional expressiveness, emotional knowledge, interaction with the interviewer, nonverbal behavior, investment in performance, fluency, avoidance), together with scales for rating overall coherence of the narrative and security.

The *security* score is a broad dimension that considers how effectively the child addressed the major issues in the story and uses the

caregivers as secure base, whereas the *coherence* evaluates how unified the story is. Each story is coded separately, and a final composite is created by using the mean for all five stories. In previous studies using this coding scheme (e.g., Bost et al., 2006), security scores were significantly associated with maternal sensitivity/elaborative style during mother–child discussions of past events, and the scales for security and coherence of the attachment stories were predicted by prior observational measures of child–mother attachment (Wong et al., 2011). Interobserver reliability was assessed through intraclass correlations, and all five narratives showed strong significant coefficients, ranging from .64 to .82 across the two countries.

Social Competence Assessment

The social competence assessments were collected independently from the attachment assessments as a component of the larger study being conducted in these preschool centers (see Vaughn et al., 2009). Between 90% and 100% of children in each classroom participated in these observation and interview components of the study.

Social competence was evaluated by using a set of seven measures representing three broad dimensions: (a) social engagement/motivation (SE/M), using directly observed behaviors (rate scores for visual attention received, initiated positive and initiated neutral interactions); (b) behavioral and psychological attributes (BPAs), using Q-sort descriptions: California Child Q-sort (CCQ; Block & Block, 1980) and Preschool Q-sort (PQ; Bronson's adaptation of a Q-sort originally used by Baumrind [1967]); and (c) peer acceptance (PA), using sociometric interviews (acceptance scores for nomination and paired-comparison sociometric tasks [McCandless & Marshall, 1957; Vaughn & Waters, 1981]).

Social motivation and engagement. Rates of visual attention received, and positive and neutral interaction initiated, were used as indicators of the SE/M domain. Numerous studies have shown that positive interaction with peers is associated with other indicators of social competence (for a review, see Rubin, Bukowski, & Parker, 2006) and, more specifically, with the child's sociometric status or peer acceptance (e.g., Denham & Holt, 1993; Denham, McKinley, Couchoud, & Holt, 1990; Hartup, Glazer, & Charlesworth, 1967; Masters & Furman, 1981). Prior to data collection, each observer spent at least 2 hr in the classroom to become familiar with the names of the children and also to allow the children to become familiar with him or her.

For interactions initiated toward peers, each child was observed during approximately 200 intervals of 15-s each. At the end of each 15-s period, the

observer registered the identification codes of all the children with whom the focal child interacted. Additionally, the affective tone of the exchange was recorded. (That is, the interaction was characterized as a positive, neutral, or negative interaction based on expressed affect of one or both children.) To be categorized as positive, (a) one or both children had to clearly evidence positive affect during the social exchange (e.g., smiles, laughs, gestures or vocalizations indicative of positive emotions); and (b) the positive-affect expression was not accompanied or followed by negative-affect demonstrations from the interactive partner (e.g., crying, distress, pain, intense irritability). To be coded as negative, (a) one or both children had to clearly evidence negative affect during the social exchange (e.g., anger, distress, fear, sadness), whether through vocal, gestural, or facial means; and (b) the negative-affect expression did not occur in the context of pretend/fantasy play. (For example, at the dollhouse, a child, pretending to be a mother, uses an angry tone of voice with her [pretend] husband because he was late for dinner.) Social interactions that could not be coded as either positive or negative were coded as neutral and included all the verbal and nonverbal exchanges that did not contain affect expression. For our purposes, only positive and neutral interactions were considered. Our observation protocol required that all children present on a given day be observed once before any child was observed twice. The 200 observation rounds typically were made over a period of 5–10 class days. Final scores were standardized within the classroom group prior to further analysis. Mean kappas for observer pairs were .71 for positive interactions and .77 for neutral interactions. All observers were previously trained by the principal investigator, and, for some children, observers were the same in Portugal and the United States.

Visual regard. Visual regard observations were collected by the same observers who provided interaction observations but according to a different observation protocol, and visual regard was not assessed as a part of the interaction observations. Each observer (two per classroom) worked independently, and each watched a given child (the focal child), for a 6-s observation interval. At the end of the interval, the codes identifying the children who received attention from the focal child were recorded as a unit of visual attention—namely, a *look* (described as the orientation of the head and/or eyes in the direction of another person for 2 s or more) or a *glance* (described as a similar orientation of the head and/or eyes for less than 2 s). When the target child looked at a group in which a specific child could not be designated as the recipient, the orientation was registered as doubtful. When the child looked at an object held by a peer and not directly at him or her, the orientation was also recorded as doubtful. These questionable instances were not considered in the total scores that

the child received. As with the interaction observations, 200 observations per child were completed over 5–10 class days. For each observation round of a class, a given target child was observed when his or her name appeared on the randomized class roster, and no child was observed twice before all children present were observed once.

The total score for visual attention corresponds to the sum of looks and glances each child received from peers. Kappa coefficients for visual attention ranged from .74 to .91 across all rater pairs with joint observation data (median = .81).

To adjust for absences from the classroom during interaction and visual regard observations, the total scores were converted to *rate scores* (i.e., by dividing the total score by the number of observation rounds for which the target child was actually present in the classroom) and standardized within the classroom. Children absent from the classroom for 50% or more of the observational rounds in any classroom were not given rate scores (i.e., treated as missing for these observations). Less than 1% of children were excluded due to missing values. Again, all observers were previously trained with the senior researcher.

Profiles of behavioral and psychological attributes. This measurement family was assessed using two Q-sorts: the CCQ (a 100-item set consisting of behavior and personality-descriptive items designed specifically for the description of young children) and the PQ (a 72-item set consisting of items more explicitly related to peer-directed behaviors and more oriented toward observable interactions). *Q-sorting* is an ipsative procedure for assigning scores to the items in a standard personality- or behavior-descriptive-item pool or Q-set. Both CCQ-sets and PQ-sets have been widely used to describe children's behavioral and personality characteristics (e.g., Buss, Block, & Block, 1980; Shields & Cicchetti, 1997; Vaughn & Waters, 1981), reflecting the general ability to establish and maintain positive social interactions, and to manage emotionally demanding situations, as well as the child's autonomy and behavioral confidence. CCQ-sort items have also been used to assess emotional regulation and autonomy (e.g., Mendez, Fantuzzo, & Cicchetti, 2002; Shields & Cicchetti, 1997), as well as inhibition and aggressiveness (Asendorpf, Denissen, & van Aken, 2008).

Q-sort descriptions of each child were used to derive social competence scores according to the criteria published by E. Waters, Noyes, Vaughn, and Ricks (1985). Q-sort observers worked in teams of two; each spending 20 hr observing the children in a variety of activity settings (e.g., small groups, mealtimes, free play indoors, outdoor play). When observations

were completed, each assistant used the prescribed Q-sort to describe all children assigned. For the CCQ-set, the items were sorted into nine categories, with a rectangular distribution of 11 items per category (except for middle category, which received 12 items). A nine-category rectangular distribution was also used for the PQ, with each category receiving a total of eight items. For the Portuguese sample, each observer used the CCQ to describe half of the children in each classroom and the PQ for the other half. For most of the children included in the U.S. samples, both observers completed both Q-sorts for every child, except when a child was absent for over 50% of the observation time with an observer. In that case, only one observer completed the sort. (If a child was missing for both observers for 50% or more of the observation time, he or she was not described by either sorter; again, less than 1% of children were excluded for the Q-sort descriptions as a result of absences.) Average cross-rater agreement was .78 for the CCQ and .71 for the PQ for the Portuguese sample and .59 for the CCQ and .62 for the American sample.

A child's Q-sort provided by the observers was subsequently correlated with the profile of a hypothetical child at the extreme for social competence that had been generated by aggregating descriptions provided by social development experts (E. Waters et al., 1985). Pearson's correlation between a Q-sort for a given child and the criterion sort for the construct becomes her or his score for that construct. When two observers contributed Q-sort descriptions of a child by using the same Q-set (i.e., children from the U.S. sample), their scores were averaged for that Q-set. The final social competence criterion scores for the CCQ and PQ were standardized within classroom prior to the primary analyses.

Peer acceptance. The peer-acceptance dimension of social competence was assessed by using two sociometric interviews: peer nominations (McCandless & Marshall, 1957) and a paired-comparison task (e.g., Vaughn, 2001; Vaughn & Waters, 1981). Similar to the measures described earlier, sociometric scores have the quality of being broadband measures for social competence. (That is, they do not assess a particular skill or social ability, reflecting instead an array of behaviors, interactions, and competencies in the context of peer relations that affect likability choices.) Two assistants collected these data in the Portuguese sample, and one assistant completed the sociometric interviews in the U.S. sample. The nomination task was usually presented first.

In the nomination task, children were presented with the set of photographs of all classmates and asked to name a peer with whom he or she especially liked to play. The request was repeated two more times, and after

that the child was asked to identify a peer with whom he or she did not especially like to play (repeated again twice). As the child named the peers, the photographs were turned face down. For this measure, peer acceptance was scored as the number of times each child was one of the first three choices by that child's peers. Total scores were divided by the number of children making choices about the target child to adjust for differences in class size.

For the paired-comparison task, photographs of all the possible pairs within each classroom (i.e., $N[N-1]/2$) were presented to the child being interviewed, who was asked to choose for each pair of photographs the peer with whom she or he especially liked to play. The pairs were arranged so that no child was seen twice before all classmates were seen once. Each child's photograph appeared the same number of times on the left- and right-hand sections of the picture file. The acceptance score for this measure was the total number of choices received from peers, divided by the number of classmates who concluded the task. As with the other measures, the scores for both sociometric tasks were standardized within the classroom prior to the analysis.

Wechsler Preschool and Primary Scale of Intelligence (WPPSI-R, 1989; the Portuguese version developed by Seabra-Santos et al. [2003]). The verbal section of the WPPSI was used to assess children's lexical capacity and verbal comprehension.

Results

ASCT Composite Scores

The correlations across the five stories were positive and significant for both the coherence and security scales (all rs $> .58$). Alphas for the attachment-theme stories were .87 for security and .87 for coherence. Composite scores (the average of scores for the five stories) were created for coherence and security.

Preliminary analyses tested the associations between verbal intelligence and children's mental representations of attachment (coherence and security), as well as mother's age and education level. None of the correlations reached significance. Next, because coherence and security were highly correlated ($r = .93$), a single aggregated measure was created (i.e., security).

Tests on differences between two subsamples (i.e., Portuguese and U.S.) revealed no significant differences for any of the four primary study variables (all Fs < 2.40 and all ps $> .05$) Descriptive statistics for the two samples are listed in Table 1.

Table 1. Descriptive values for security and social competence indicators

	Portugal		United States	
Variables	Mean	*SD*	Mean	*SD*
Social competence composite	0.03	0.85	0.06	0.95
Social engagement/ motivation	0.07	0.73	0.05	0.63
Profile of behavior/ psychological attributes	0.02	0.89	0.01	0.92
Peer acceptance	0.06	0.95	0.04	0.93
Security	5.60	1.02	5.13	1.09

Social Competence Results

As shown in Table 2, correlations among same-family measures tended to be higher than correlations with indicators from different measurement families. Drawing on the confirmatory factor analyses reported by Vaughn et al. (2009), scores were created for the three indicator dimensions: social engagement/motivation, profiles of behavioral and psychological attributes, and peer acceptance. Verbal IQ from the WPPSI was significantly correlated with the peer acceptance composite, $r = .25$, $p < .05$, however, controlling for Verbal IQ did not appreciably reduce the cross composite correlations for peer acceptance. The three domain composite scores were themselves aggregated to derive a social competence composite score, with an alpha of .71 (Table 2).

Attachment Representations and Social Competence

The relation between security and the social competence values was assessed by using Pearson's correlation coefficient, and the results are listed in Table 3. The security score was positively and significantly related to the composite social competence score and to each of the three component dimensions for both samples. For the peer acceptance composite only, Table 3 presents the partial correlations with security score controlling for Verbal IQ.

Table 2. Correlations among the social competence indicators

Variables	Paired comparisons	CCQ	PQ	Visual attention	Positive interactions	Neutral interactions
Positive nominations	.64**	.31**	.22**	.37**	.35**	.33**
Paired comparison	–	.37**	.21**	.32**	.34**	.32**
CCQ	–	–	.41**	.43**	.27**	.38**
PQ	–	–	–	.33**	.21**	.22**
Visual attention	–	–	–	–	.42**	.48**
Positive interaction	–	–	–	–		.37**

Note. No between-sample auto-correlations were significantly different (using z-tests for correlation magnitudes) for any indicator variable. CCQ, California Child Q-sort; PQ, Preschool Q-sort. $^{**}p < .01$. $^{*}p < .05$.

Table 3. Correlations between social competence indicator dimensions and children's attachment representations

Variables	Security
Social competence composite	.42**
Social engagement/motivation	.30**
Profile behavior/psychological attributes	.34**
Peer acceptance	.29**

Note. Between-sample z tests for correlation magnitudes did not reveal any significant differences between the Portuguese and U.S. samples. $^{*}p < .05$. $^{**}p < .01$.

Discussion

This study was initiated, in part, to further explore the hypothesis from attachment theory that children's representations of secure attachment relationships should be associated with child social competence in the peer group. Our findings are consistent with this hypothesis. However, because the measures of attachment and social competence were assessed concurrently rather than temporally separated, our data do not speak to a causal relation between these two construct domains. The bulk of studies examining this hypothesis have used attachment measures from infancy/toddlerhood that assess enacted (or sensorimotor) representations of the attachment relationship (e.g., the Strange Situation and/or the Attachment Q-sort).

Fewer studies have assessed the child's internal/cognitive representations (inferred from their verbal responses to story stems) of attachment in relation to measures of social competence (e.g., Verschueren & Marcoen, 1999). Our findings suggest that the internal working models emergent from earlier sensorimotor representations and from continuing interactions with the attachment figure (see Wong et al., 2011) are meaningfully related to child social competence assessed directly from child behaviors and interviews. These results are consistent with previous research results from studies using measures of enacted representations of attachment, and they extend the generality of these results to a sociocultural community (i.e., Portugal) that has not been well represented in previous research.

These data were also used to test a methodological hypothesis proposed by E. Waters and Sroufe (1983) to the effect that social competence in the peer group is a complex construct that cannot be fully described with single measures of narrow behavioral domains because no single measure or domain exhausts the meaning of the social competence construct. We selected an attachment measure that has been tested and validated over a number of years (e.g., Bretherton et al., 1990; H. S. Waters, Rodrigues, & Ridgeway, 1998; Wong et al., 2011) as our measure of internalized attachment representations (i.e., working models) because this measure requires the child to react to multiple scenarios relevant to attachment security (e.g., separation/reunion from the caregiver, physical harm/injury, psychological threats to the attachment relationship, fantasy threats to physical integrity). The ASCT yields scores for several variables, final scores are composites over multiple scorings for single vignettes, and these final scores demonstrate high internal consistency (i.e., Cronbach's alpha). The security composite also shows significant associations with enacted attachment representation measures (e.g., Bretherton et al., 1990; Wong et al., 2011), suggesting that the indicator meets the requirements of broadband measurement set by E. Waters and Sroufe. In this sample, the security and coherence scores were very highly correlated, and our final attachment criterion was a composite of the two.

We also used a battery of social competence indicators that has been tested and validated over the past decade (e.g., Bost et al., 1998; Santos et al., 2013; Vaughn et al., 2009). In the spirit of E. Waters and Sroufe (1983), we created composites of related indicator variables to reflect three dimensions relevant to social competence and then averaged the values for the three constructs to yield a single broadband index of social competence. The results are consistent with the argument made by E. Waters and Sroufe that the overlap between attachment and peer competence would increase when reliable, broadband measures for both constructs were used.

That is to say, correlations between the attachment indices and individual indicator dimensions (e.g., social engagement/motivation) were lower than the associations with the final composite indicator.

In part, of course, this result reflects the increase in the reliability of the social competence composite that accrues due to the principle of aggregation. (For example, Rushton et al. [1983] also argued that many developmental studies are hampered by using narrow band measures whose internal consistency is low relative to aggregated variables.) But we believe that our results also reflect the reality that there are no "pure" measures of most complex constructs. Indeed, there is ample evidence that each of our social competence indicators also captures variance of noncompetence related dimensions. For example, Hartup (1970) reviewed studies showing that peer sociometric measures are often associated significantly with physical attractiveness, social class, ethnic status, and physical disabilities, which are not obviously indicators or consequences of social competence. We would not predict that attachment security should necessarily be related to any of these other correlates of peer acceptance.

We suggest that this same issue accounts in large part for the conclusions reached by Schneider et al. (2001) as a result of their meta-analysis. For the most part, outcome measures reported in studies included in their meta-analysis were relatively narrow band, and very few attempted to aggregate measures over assessment methods. When aggregated were scores for indicators across relevant social competence domains, the association between attachment security and peer social competence showed a positive, significant association, with an ES over twice as large ($r = .41$) as the average ES reported for children under 8 years of age ($r = .17$) by Schneider et al. (2001) and over 50% larger than average ES reported for children over 8 in their analysis. We acknowledge that our results constitute only a single data point from the standpoint of meta-analysis, but we would argue that most meta-analyses would be improved if the quality of measurement for central constructs was evaluated realistically by the meta-analyst, and studies were weighted accordingly.

We also recognize the there are limitations and constraints on the generality of our findings. For example, the participating children recruited to the study came from predominantly middle-class families and were attending private, nonprofit, early childhood education programs. Less advantaged children might have had more difficulties with the cognitive demands of the ASCT. (However, the classroom social competence measures have been used successfully across a range of social class and ethnic groups.) Further, as noted earlier, the attachment and social competence assessments were completed concurrently, and we cannot conclude that

attachment was a primary cause of social success and social competence in the classroom. Longitudinal studies in which attachment is assessed prior to entry into the childcare setting will be required to establish a temporal–causal sequence consistent with this hypothesis.

In conclusion, attachment theory suggests that individual differences with respect to attachment security should support the child's assembly of skills, attitudes, values, and expectations about others that underlie social competence and lead to successful integration into social groups outside the family. However, prior studies testing these hypotheses have yielded relatively weak and mixed findings in their support. E. Waters and Sroufe (1983) argued that measurement of both attachment and social competence is a critical issue because both constructs are complex and neither is reducible a single measurement dimension. We identified and employed broadband measures of attachment representations and of social competence. By using these measures, we found positive, significant, and consistent associations between attachment security and social competence that are substantially larger than associations reported in most prior studies of these relations. As anticipated by Waters and Sroufe, the composite measures yielded stronger results than did correlations with individual domain indicators. We interpret our results as support for the hypothesis that attachment security is a foundational support for peer social competence and also as support for the conceptual framework for describing and studying the development of competence offered by Waters and Sroufe. Lastly, our results demonstrate that these relations are observable in a sociocultural milieu different from the North American/Anglo cultures that gave rise to these conceptualizations of attachment security and social competence.

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