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Children's Representations of Family Relationships, Peer Information Processing, and School Adjustment

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Abstract

This study examined children's peer information processing as an explanatory mechanism underlying the association between their insecure representations of interparental and parent-child relationships and school adjustment in a sample of 210 first-graders. Consistent with emotional security theory (EST; Davies & Cummings, 1994), results indicated that children's insecure representations of the interparental relationship were indirectly related to their academic functioning through association with their negative information processing of stressful peer events. Insecure interparental relationships were specifically linked with negative peer information processing patterns which, in turn, predicted increases in child maladjustment over a one-year period. These pathways remained robust after taking into account the roles of representations of parent-child relationships, trait measures of child negative affect, and socioeconomic characteristics as predictors in the analyses.

Children's internal representations of how their parents get along with each other are theorized to play a key role in accounting for the variability in children's adaptation to interparental conflict (Davies & Cummings, 1994; Grych & Fincham, 1990). According to Emotional Security Theory (EST; Davies & Cummings, 1994), witnessing destructive conflicts between parents increases children's vulnerability to adjustment problems by amplifying children's negative internal representations of the consequences of interparental relationships for their own welfare and the stability of the marital system. Likewise, the Cognitive-Contextual Framework proposes that children's appraisal of the threat posed by interparental conflict is an intermediary process in pathways between exposure to marital conflict and child problems (Grych & Fincham, 1990). In support of this common prediction, research has repeatedly identified children's insecure representations of interparental relations as intervening mechanisms in the association between interparental and child functioning using both cross-sectional and longitudinal designs (Dadds, Atkinson, Turner, Blums, & Lendich, 1999; Davies & Cummings, 1998; Grych, Harold, & Miles, 2003; Harold, Shelton, Goeke-Morey, & Cummings, 2004). However, the question of how and why insecure representations of interparental relationships increase children's vulnerability to psychological problems remains largely unaddressed (Davies, Winter, &

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Cicchetti, 2006). Accordingly, the present study addresses this gap in the literature by examining children's peer information processing as a mediating mechanism in pathways between their insecure representations and academic adjustment, a critical, but neglected, aspect of adjustment during the early elementary school years.

In addressing the first link in our proposed mediational chain, EST draws on several conceptualizations in positing that children's representations of the interparental relationship, as manifestations of underlying concerns about their sense of safety, serve as guides for interpreting and responding to novel or challenging peer events (Davies, Winter, et al., 2006). For example, a primary thesis of attachment theory is that children develop models or representations of family relationships, which they later use as guides in new settings to help them negotiate other social experiences (Bowlby, 1973). Expanding this assumption to children's appraisals of the interparental relationship, Johnston and Roseby's (1997) script theory asserts that children from high conflict homes develop negative scripts consisting of both conscious and unconscious rules and expectations about relationships between their parents. These scripts, in turn, are utilized by children as prototypes for simplifying, evaluating, and responding to other social contexts. Similarly, prevailing psychobiological conceptualizations have proposed that children's greater proficiencies in processing and interpreting negative family events have long term maladaptive implications by sensitizing children to subsequent negative stimuli and restricting their abilities to process benign or constructive features of social experiences (Pollack & Tolley-Schell, 2004).

Although negative representations of interparental relationships may be associated with individual differences in children's information processing across multiple types of social relationships, there are compelling theoretical bases for expecting that information processing in provocative peer settings should be a particularly consistent correlate of interparental representations during the early elementary school years. The formulation of script theory outlined by Johnston and Roseby (1997) proposes that children rely more heavily on prior interparental representations in subsequent interpersonal contexts that are demanding in terms of their novelty, complexity, and stressfulness. Provocative peer situations during the early elementary school years meet all of these criteria. As a stage salient task that becomes prominent during this developmental period, the establishment and maintenance of peer relationships is conceptualized by developmental models as both novel and complex (Cicchetti, 1993; Collins, Harris, & Susman, 1995). For example, in approaching this task, children experience increases in the quantity, complexity, and diversity of peer situations with greater scholastic demands and extracurricular (e.g., sports, social groups) activities (Ladd, Herald, & Kochel, 2006). Underscoring the stressful nature of peer settings, children must also contend with numerous adverse peer events (e.g., bullying, teasing) as victims or bystanders (Kochenderfer & Ladd, 1996). Thus, pathways between children's insecure representations of interparental relations and children's processing of stressful peer events may be particularly robust during the early elementary years.

Our conceptualization of children's peer information processing was heavily influenced by social information processing (SIP) theory (Crick & Dodge, 1994). Children's attributions of peer intent and the generation of a behavioral response during peer transgressions are regarded as two central components of peer processing in SIP. Supporting this thesis, studies show that higher levels of negative attributions of peer intent and the endorsement of aggressive behavioral responses in provocative peer contexts are indicators of a broader hostile information processing style which, in turn, is a consistent predictor of concurrent and subsequent child maladjustment (Dodge et al., 1986; Dodge, Bates, & Pettit, 1990; Dodge et al., 2002; Weiss et al., 1992). However, more recent formulations of social

information processing theory have underscored the need to better capture the processing and attribution of emotion processes in the affect-laden context of peer transgressions (Arsenio, Cooperman, & Lover, 2000; Lemerise & Arsenio, 2000). The few empirical attempts to infuse affect in SIP support the promise of obtaining other indices of SIP through the integration of dimensions of encoding (i.e., perception of positive and negative affect) and attributions that more thoroughly capture positive and neutral intent of peers (e.g., Garner & Lemerise, 2007; Lemerise, Fredstrom, Kelley, Bowersox, & Waford, 2006). Consistent with this recent work, the current study complemented conventional measures of children's negative attributions and endorsement of aggressive solutions with the assessment of their interpretation of peer affect and a wider range of attributions that capture both prosocial and antisocial motives for the transgression.

In addressing the second path in the proposed mediational associations, developmental models offer support for the notion that negative peer information processing should predict scholastic maladjustment (Cicchetti, 1993; Davies, Winter, et al., 2006; Waters & Sroufe, 1983). Adapting to the increasing academic demands of formal schooling is regarded as another central stage-salient task during the early elementary school years. Children are charged with the responsibility of successfully completing their school work while contending with the demands of focusing and sustaining their attention to a progressively more challenging curriculum and learning and complying with increasingly complex rules for engaging cooperatively in classroom instruction (Entwisle, 1995; Ladd, Herald, & Kochel, 2006). Thus, hostile ways of processing peer information may disproportionately amplify the difficulties of an already normatively challenging task of adjusting to school. Moreover, children's hostile peer information processing patterns may be a more proximal predictor of school adjustment than their negative representations of family relationships because, as fellow classmates, peers are an integral part of the academic environment. In attempting to coordinate peer and academic matters, biases to scan and process peer events in negative ways may directly interfere with children's abilities to regulate and maintain attention, motivation, and effort on task relevant components of school work by introducing conflicting demands within the limited capacity of attention and executive (e.g., planning, working memory) functioning networks (Botvinick, Braver, Barch, Carter, & Cohen, 2001; Rothbart & Posner, 2006). Accordingly, we examine children's academic functioning (i.e., academic performance, cooperative participation in the classroom, attention to academic tasks) as the adjustment outcome of the mediational interplay between negative representations of interparental relationships and peer information processing.

Although compelling theoretical bases exist for expecting that peer information processing will mediate the link between children's interparental representations and their school adjustment, there are also plausible alternative mechanisms of effect which presume that covariation between peer processing and their school adjustment are simply spurious artifacts of a more operative underlying process. First, according to the negative affectivity hypothesis (Davies et al. 2002; Harold & Conger, 1997; Watson & Pennebaker, 1989), a general disposition to experience a wide range of negative emotions (i.e., anger, guilt, fearfulness, depression), may be manifested in higher levels of negative family representations, peer information processing, and academic adjustment problems. Therefore, we examine our mediational hypotheses in relation to an alternative model in which representations of family relationships, peer information processing, and school adjustment are manifestations of a negative affect trait.

Second, another alternative model is that the mediational pathways are more simply accounted for by children's socioeconomic status (SES). For example, although findings are not always consistent, lower SES has been associated with higher levels of negative family appraisals (Toth, Cicchetti, Macfie, & Emde, 1997), hostile peer information processing

patterns (Shultz & Shaw, 2003), and school adjustment problems (Ackerman, Brown, & Izard, 2004; Duncan & Brooks-Gunn, 2000). Thus, as a further test of the viability of our model, we examine whether the mediational role of peer information processing remains robust even after specifying pathways between SES and children's representations of family relationships, peer information processing, and school adjustment.

Third, alternative family models have proposed that parent-child relationship processes are complete mediators of associations between interparental relationship processes and child adjustment (Buehler, Benson, & Gerard, 2006; Fauber & Long, 1991; Levendosky, Leahy, Bogat, Davidson, & von Eye, 2006). In building on this premise, a plausible derivative hypothesis is that associations between insecure interparental representations and peer information processing can be fully explained by comparable assessments of security in the parent-child relationship. In fact, prior research has documented relationships between children's insecure representations of the parent-child relationship and their hostile information processing of peer events (Cassidy, Kirsh, Scolton, & Parke, 1996). Thus, it is possible that interparental representations do not add any additional power as predictors of the meditational pathways after inclusion of parent-child representations as a predictor. In contrast, EST proposes that parent-child and interparental representations, while sharing some substantive overlap, are unique in some of their properties and implications for children's coping and adjustment in extrafamilial settings. For example, in EST, insecure interparental representations are largely characterized by children's apprehensions of the threatening relational consequences of interparental stressors for themselves and their families, whereas insecure parent-child representations are defined by attachment-based concerns about the ability of the parents to serve as sources of protection and support (Davies & Sturge-Apple, 2007). Accordingly, we test our EST derived prediction that both interparental and parent-child insecurity will each uniquely account for individual differences in children's development against the alternative hypothesis that associations between children's insecure representations of the interparental relationship and their negative peer information processing and adjustment problems are fully explained by co-occurring insecure representations of parent-child relations.

Several methodological features were employed to advance the rigorous test of our hypotheses. To address the preponderance of cross-sectional designs in the literature on internal representations of family relationships, this study utilized a longitudinal design to more definitively identify the temporal ordering among our constructs. Our autoregressive modeling of school adjustment in our analyses specifically permitted a more comprehensive analysis of change by controlling for prior values of children's scholastic adjustment (Cole & Maxwell, 2003). In addition, the design of the study generated more rigorous assessments of the main constructs by utilizing multiple methods (i.e., structured interviews, observations of semi-structured interviews, and questionnaires) and informants (i.e., child, teacher).

Method

Participants

Data for this study were collected as part of a larger, ongoing longitudinal project on family relationship processes and child development. At the first wave in this paper, the sample consisted of 226 first-grade children and their mothers and fathers. Families were originally recruited through local school districts and community centers in a moderate-sized metropolitan area in the Northeast and a small city in the Midwest. Families returned one year later to participate in a second wave of data collection. The retention rate from Wave 1 to Wave 2 was 93%, making the resulting sample size for the current study 210. In the present study, four cases were missing single data assessments across different variables. To maximize inclusion of our study participants who had participated in study assessments over

the course of the study, we utilized the EM algorithm for estimating missing data. The average age of the children at Wave 1 was 7.0 years (*SD* = .48), with 55% of the sample consisting of girls (*n* = 115) and 45% of the sample consisting of boys (*n* = 95). The mean ages of the mothers and fathers were 35.0 (*SD* = 5.53) and 37.0 (*SD* = 6.02) years, respectively. Median household income of the families was between $40,000 and $54,999 per year. On average, mothers and fathers completed comparable years of education, 14.54 years (*SD* = 2.33) and 14.68 years (*SD* = 2.69), respectively. A large proportion of the sample was European American (79%), followed by smaller percentages of African American (15%), Latin American (3%), and other racial families (3%). Families lived together for an average of 5.55 years (*SD* = 1.03) prior to the first wave of data collection. Children lived with their biological mother in the majority of cases (95%), with the remainder of the sample living with either an adoptive mother (3%) or a stepmother or female guardian (2%). In addition, children lived with their biological father in the majority of cases (87%), with the remainder of the sample living with either an adoptive father (4%) or a stepfather or male guardian (9%). As part of the inclusionary criteria for this study, mothers, fathers, and their kindergarten children had lived together for at least three years prior to initial data collection (*M* = 5.35 years together; *SD* = 1.06).

Minimal differences were found between the present sample (*n* = 210) and participants who were lost to attrition (*n* = 16). Statistical comparisons between the two groups along demographic variables (e.g., race-ethnicity, family income, marital status) and the 19 interparental, parent-child, and child variables used in the present study yielded three significant differences: Relative to families who participated in the present study, excluded families attained less education and were higher on two indices of insecure representations of parent-child relations (i.e., caregiver incompetence and overall felt insecurity).

Procedures

Data for the present study were gathered at two measurement occasions spaced 1 year apart. At each wave, children, accompanied by their parent, visited one of the sites twice spaced 1 week apart. Laboratories at both sites were comparable in size and quality. Both sites contained interview rooms for completing confidential interview and survey measures. The study was conducted under the approval and direction of the Institutional Review Boards (IRBs) at both data collection sites.

Revised MacArthur Story Stem Battery—Children completed the revised version of the MacArthur Story Stem Battery (MSSB-R; Cummings, Schermerhorn, Keller, & Davies, 2008; Davies, Sturge-Apple, Winter, Cummings, & Farrell, 2006) at Wave 1. The MSSB-R is a narrative story-telling technique designed to assess children's internal representations of the interparental and parent-child relationship (MSSB; Bretherton, Oppenheim, Buschsbaum, Emde, & The MacArthur Narrative Group, 1990). Consistent with our conceptualization that children's representations of family life reflect appraisals that can vary widely in their accessibility to conscious awareness (Davies & Sturge-Apple, 2007; Johnston & Roseby, 1997), narrative story stem techniques are regarded as a more comprehensive assessment of representations at varying levels of awareness than questionnaire or structured interview measures (Robinson, 2007). Furthermore, projective story techniques are designed to increase validity of representational assessments by taking advantage of children's natural interest, engagement, and skill in storytelling (Bretherton, Ridgeway, & Cassidy, 1990).

In accord with the original procedures in the MSSB, the experimenter administering the MSSB-R presented seven story stems describing different stressors and threats to the various family subsystems (i.e., three interparental, two mother-child, and two father-child stories).

For example, in one of the interparental stories, the mother and father exchange heated words about responsibilities for cleaning up the kitchen. As another example, some of the parent-child stories depict conflicts about the children finishing their dinner and cleaning their room. To help engage the child in the task, experimenters utilized dramatic, lively voices, toy props, and family action figures that corresponded to the child's ethnicity and gender. After each enactment, children were asked to complete the story using the action figures and props as an aid. Children were told to imagine they were the child action figure and the adult figures were their parents. Videotaped records of the children's responses to the vignettes were obtained for later coding of children's interparental and parent-child representations.

Peer information processing task—To assess children's peer information processing, experimenters interviewed children at Wave 1 about their responses to five peer instrumental provocation stories adapted from an instrument developed by Dodge and colleagues (Dodge, Lochman, Harnish, Bates, & Petit, 1997; Dodge, Petit, Bates, & Valente, 1995). Children listened to stories about same-sex peers causing some stressful event for the protagonist, illustrated visually by accompanying cartoon stimuli (e.g., peer spills milk on child's shirt). The circumstances and the intent of the peer were ambiguous. After each story, children answered a series of multiple choice and open-ended questions in the same order. Experimenters recorded the narratives of children's responding to open-ended questions in written form for later coding.

Child adjustment questionnaires—Children's mothers and fathers independently completed questionnaries to assess children's negative affect dispositions at Wave 1, while their classroom teachers completed questionnaires to assess their school adjustment at Waves 1 and 2.

Measures

Insecure representations of the interparental relationship—Coders at the Midwest research site rated the videotaped records of children's responses to each of the three interparental stories of the MSSB-R along three molar rating scales designed to assess insecure representations of the interparental relationship. First, the *Poor Relationship Quality* code assesses the child's appraisals of the emotional impact of conflict in the interparental relationship. The rating of the overall dyadic relationship ranged from: (1) *intense harmony*: portrayals of supportive interparental relations to (5) *intense discord*: representations consisting of signs of intense, prolonged problems between parents. Second, the *Caregiver Incompetence* code indexes separate appraisals of each parent as competent and resourceful in child-rearing. Ratings of (1) *very competent* indicated that the child viewed the caregiver as a source of support in the face of interparental difficulties. Conversely, (5) *very incompetent* ratings denoted portrayals of the caregiver as ineffective or frightening during interparental discord. Due to the high intercorrelation between separate ratings of maternal and paternal competence (r = .87), ratings were aggregated across each parent to increase parsimony in our statistical models. Third, coders rated each story along a five-point scale of *Overall Felt Insecurity* ranging from (1) *strong security*, in which the parents are depicted as resolving challenges in a manner that fosters family harmony and the welfare of the child to (5) *strong insecurity*, in which the interparental disagreement is portrayed as a severe threat to the child's safety and welfare.

Four independent coders, who were trained to reliability, were randomly assigned to code MSSB-R narratives of subsamples of children in the study. To evaluate interrater reliability, all coders were responsible for rating the same subsample (i.e., 20%) of tapes. Intraclass correlation coefficients for each of the three rating scales within each story ranged from .87

to .95. Ratings along each scale were aggregated across the three stories to yield three indicators of insecure interparental representations. In support of its validity, the MSSB-R interparental representations codes are consistent correlates of forms of family adversity (e.g., interparental conflict, parent depressive symptoms) and predictors of subsequent child adjustment problems (Cummings et al., 2008; Davies et al., 2008; Sturge-Apple et al., 2008).

Insecure representations of the parent-child relationship—The same four coders at the Midwest research site rated the four stories of stressful parent-child events in the MSSB-R using the same three rating scales used to assess insecure interparental representations. Therefore, the *Poor Relationship Quality* scale indexed intense problems in the parent-child relationship, whereas *Caregiver Incompetence*, at high levels, reflected serious doubts about the abilities of parents to serve as sources of protection and support. *Overall Felt Insecurity* reflected children's collective portrayal of the parent-child relationship as a source of severe threat to their welfare. Children's appraisals of the mother-child and father-child stories were moderately to strongly correlated across the three rating scales (*r*s between .46 and .60). Therefore, to increase parsimony and power in our analyses, we aggregated ratings across the mother and father stories to yield three dimensions of insecure representations of parent-child relations (i.e., poor relationship quality, caregiver incompetence, overall felt insecurity). Intraclass correlation coefficients, which indexed interrater reliability on the 20% subsample of videotapes, ranged from .81 to. 89. In support of its validity, measures of parent-child representations derived from the MSSB and its adaptations are associated with indices of family process (e.g., parental emotional availability) and child adjustment in theoretically predicted ways (Macfie et al, 1999; Sturge-Apple et al., 2008; Toth et al., 1997).

Peer Information Processing—Children's responses to a standard set of interview questions for each of five peer information processing task stories were coded along three dimensions: hostile attribution bias, perceived peer affective motives, and generation of a behavioral response. To assess children's hostile attribution bias, children responded to the question, "Why did the boy/girl [description of the specific provocation]?" Experimenters administered additional probes to the open-ended question to yield a thorough assessment of attributions (e.g., "Did the kid mean to do it or not mean to do it?"). Responses were subsequently coded along a five point scale ranging from (1) *very benign*: in which children's responses uniformly and definitively reflect that the peer's intent was benign (e.g., "it was an accident," "did not mean to do it," and "was not being mean") to (5) *very hostile*: in which the pattern of responding consistently conveyed malevolent attributions of intent (e.g., "did it on purpose," "meant do it," and "was being mean"). Given that children responded to several probes to obtain a richer account of children's attributions, the three anchors in between were designed to capture patterns of responding that reflected some child doubts regarding the benign or malevolent nature of the task. Therefore, (2) *somewhat benign* ratings were characterized by consistent endorsements of benign attributions that were qualified by mild doubt about the innocence of the transgressor, whereas (4) *somewhat hostile* ratings reflected consistent endorsement of malevolent attributions that were qualified by mild doubt about the culpability of the transgressor (e.g., multiple endorsements of malevolent and purposeful intent are peppered with some indication that the child was not being mean). Finally, (3) *ambiguous or neutral* ratings were reserved for responses that were ambiguous or relatively balanced in endorsements of malevolent and benign intent.

As a more affective index of social information processing, two questions from each story assessed children's perceived motives underlying their appraisals of peer affect. Following prior SIP research (e.g., Cassidy et al., 1996; Garner & Lemerise, 2007), children were asked to select one of the five emotions (i.e., mad, happy, sad, okay, scared) that best

corresponded to their perceptions of the peer's feelings in response to the question: "How do you think the girl/boy feels after s/he [description of the specific provocation]?" Experimenters presented face cards depicting the five emotions to assist children in responding to the question. Children then responded to the follow up question, "What is the girl/boy [emotion] about?" Probes were introduced as needed for children who had difficulty understanding the question or provided vague responses. Coders rated children's pattern of responses to the questions along a *Perceived Motives* scale ranging from: (1) *high prosocial*: perceived motive for the affect was based on genuine concern and empathy for the child (e.g., transgressor "feels happy because I am alright," "feels sad because they feel sorry for me"); (2) *mild prosocial*: perceived motive for the affect indicates that they internalize and appreciate social rules and norms (e.g., transgressor "feels okay or sad because it was an accident" without mention of a focus or concern of the child); (3) *ambiguous/neutral*: perceived motive is not weighted toward either a prosocial or antisocial response; (4) *mild antisocial*: perceived motive for the affect reflects egoism, selfishness, and unmitigated agency (e.g., "angry because s/he might get told on or get in trouble"); and (5) *high antisocial*: perceived motives of harming the child or seeking retribution (e.g., "happy because s/he likes to be mean to me," "angry because s/he wants to get back at me").

To assess children's generation of a behavioral response for each story, children responded to the question: "What would you do next after the girl/boy [description of the specific provocation]?" Ratings on the four-point *Hostile Behavior* scale ranged from (1) *No hostility* to (4) *Severe hostility* (e.g., child endorses substantial physical violence, destruction of property with clear intent to hurt other, or prolonged acts of relational aggression such as name calling and teasing).

Following standard procedures (e.g., Dodge et al., 1995), ratings of children's responses to the questions were aggregated across the five stories to yield composites of the three peer information processing dimensions. Ratings of responses within each information processing dimension evidenced satisfactory internal consistency across the five stories (i.e., $\alpha s > .70$). Two coders at the Northeast research site, who were extensively trained to reliability, independently coded 100% of the tapes. Intraclass correlation coefficients, which examined interrater reliabilities of the two coders, ranged from .83 to .91.

Child school adjustment—Teachers completed questionnaires to tap components of children's school adjustment. First, teachers completed the Attention Difficulties subscale from the Child Behavior Scale (CBS; Ladd & Profilet, 1996). The Attention Difficulties subscale is comprised of the average of responses of four items designed to assess children's abililty to focus and concentrate in the classroom (e.g., "poor concentration, attention span," "inattentive"). Teachers responded to each item by selecting one of three response alternatives (1 = "doesn't apply," 2 = "applies sometimes," 3 = "certainly applies"). Reliability and validity of the measure is supported by several studies (see Ladd & Profilet, 1996; also Clark & Ladd, 2000; Legace-Seguin & Coplan, 2005). Internal consistency of the scale at each measurement occasion in the present study was satisfactory (.87 and .86 at Waves 1 and 2, respectively).

Second, teachers completed the Cooperative Participation subscale from the Teacher Rating Scale of School Adjustment to assess children's adjustment to classroom demands (TRSSA; Birch & Ladd, 1997). The seven items on the subscale are designed to measure the extent to which children comply with classroom rules, standards, and activities in a responsible, respectful manner (e.g., "follows teacher's directions," "uses classroom materials responsibly"). Response alternatives included: 0 = "doesn't apply," 1 = "sometimes applies," and 2 = "certainly applies". Responses to the items were averaged together. Considerable empirical documentation supports the psychometric properties of the

Cooperative Participation subscale (e.g., Birch & Ladd, 1997; Ladd & Burgess, 2001). Alpha coefficients for the subscale for the first and second waves of assessment were both . 89.

Finally, teachers completed the Academic Competence subscale from the Teacher's Rating Scale of Child Actual Behavior (TRS; Harter & Pike, 1984). The Academic Competence Scale consists of three items that are designed to assess children's academic achievement. Consistent with procedures designed to reduce socially desirable responding, each item is organized in a sequence of two alternative statements (e.g., "This child is really good at his/her school work" or "This child can't do the school work assigned"). After selecting which statement best characterized the child, teachers then rated the degree of correspondence between the child and the statement by choosing either "sort of true" or "really true." Responses were later scored along a four-point scale where "4" corresponded with the endorsement of "really true" to the academic competent statement and "1" signified the endorsement of "really true" to the academic incompetent statement. Previous research supports the validity of the TRS. The factor structure, internal consistency, and validity of the Academic Competence subscale are documented by past studies (e.g., Harter & Pike, 1984; Boivin & Begin, 1989; Webster-Stratton & Lindsay, 1999). Alpha coefficients for the Academic Competence subscale in this study were .91 at Wave 1 and .92 at Wave 2.

Trait negative affect—Consistent with assessments of trait negative affect in prior research (Harold & Conger, 1997), mothers and fathers completed the internalizing (Anxiety/Depressed and Withdrawn subscales) and externalizing (Aggressive and Delinquent subscales) symptoms scales from the Child Behavior Checklist (CBCL; Achenbach, 1991). For each of the items, reporters indicated whether or not each statement was true of the child on a 3-point scale. Internal consistencies for father and mother composites ranged from 84. to .90.

Family socioeconomic status (SES)—To examine socioeconomic status as a predictor in the analyses, we obtained data from parents on (a) maternal education level in years, (b) paternal education level in years, (c) total family income ranging in incremental categories from 1 (less than $6,000) to 9 (i.e., $75,000 or more), (d) maternal occupation, and (e) paternal occupation. Descriptions of parental occupations were subsequently coded using the Socioeconomic Index, with higher scores reflecting greater occupational prestige (Entwisle & Astone, 1994). The five indicators were then standardized and summed to form a single composite of SES ($\alpha = .83$).

Results

Table 1 presents the means, standard deviations, and the intercorrelations among the manifest indicators. In support of the measurement model, manifest indicators of the main constructs (i.e., insecure interparental representations, insecure parent-child representations, peer information processing, school adjustment) were in the expected direction and were generally moderate in magnitude.

Preliminary Analyses

Structural equation modeling (SEM) through the Amos 7.0 statistical software was utilized to test the role of peer information processing as a mediating mechanism in the link between children's insecure representations of family relationships and their adjustment to school. Testing our conceptual model in SEM first required demonstrating the fit of our measurement model or, more specifically, the adequacy of our specification of patterns of relations among manifest and latent variables. Therefore, we constructed a measurement

model that included the manifest and six latent variables depicted in Figure 1, their intercorrelations, and each of their respective manifest indicators. Model fit was assessed using (1) the root mean square error of approximation (RMSEA), with values of .08 or less reflecting reasonable fit (Browne & Cudeck, 1993), and (2) the χ^2 / *df* ratio, with values less than 3 indicating acceptable fit (Arbuckle & Wothke, 1999), and (3) the comparative fit index (CFI), with values greater than .90 reflecting adequate fit (Bentler, 1990). The measurement model provided an adequate representation of the data, χ^2 (144, N = 210) = 332.30, $p < .001$, χ^2 / df = 2.31, CFI = .92, RMSEA = .08 Factor loadings for all manifest indicators of the latent constructs were significant and in the expected direction. Standardized loadings of the manifest indicators for both models ranged from .29 to .95 (M = .74).

Primary Analyses

Following guidelines by Baron and Kenny (1986), testing mediation first requires demonstrating significant relationships between the predictor and the outcome variables. Therefore, SEM analyses first tested the direct associations between each form of insecure representations (i.e., interparental and parent-child) and subsequent changes in children's school adjustment from Wave 1 to Wave 2. To test for these direct associations, we estimated all the paths in Figure 1 except for the path between peer information processing and school adjustment which was constrained to 0. Consistent with hypotheses, results indicated that insecure representations of the interparental relationship (β = -.17 $p < .01$) and parent-child relationship (β = -.13 $p < .05$) at Wave 1 predicted lower school functioning at Wave 2.

To examine the mediating role of negative peer information processing in associations between insecure interparental representations and child school functioning, we estimated the full model depicted in Figure 1 that also specified a path between the proposed mediator (peer information processing) and outcome (school adjustment). Within this model (see Figure 1), we simultaneously examined (a) insecure parent-child representations, (b) family SES, and (c) children's negative affect disposition as potential alternative mechanisms that may account for the proposed mediational paths among interparental representations, peer information processing, and school adjustment. The correlation among the error terms of the Wave 1 endogenous predictor variables was also specified (see Figure 1). The overall model provided an acceptable representation of the data, χ^2 (147, N = 210) = 353.31, $p < .001$, χ^2 / df ratio = 2.40, CFI = .91, RMSEA = .08.

Consistent with the proposed mediational hypotheses, insecure interparental representations were associated with children's poor peer information processing (β = .26, $p < .05$). Children's negative peer information processing, in turn, predicted decreases in their school adjustment at Wave 2, β = -.22, $p < .05$, even after controlling for the significant auto regressive path from Wave 1 to Wave 2 school adjustment, β = .65, $p < .001$. Notably, these paths were robust even while simultaneously specifying pathways involving the three alternative mechanisms (insecure parent-child representations, child trait negative affect, and family SES). As a further test of mediation, follow up analyses recommended by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) indicated that the indirect pathway involving insecure interparental representations, negative peer information processing, and child school adjustment was significant, $z' = 1.48$, $p < .05$.

Examination of the remaining pathways in Figure 1 did not support the viability of the three alternative models. First, the latent construct of child trait negative affect was negligibly associated with children's representations of family relationships, negative peer information processing, and Wave 2 school adjustment. Second, pathways among SES and children's representations of the family, peer information processing, and school adjustment were

nonsignificant. Third, contrary to our hypotheses, insecure parent-child representations were unrelated to peer information processing.

In light of prior empirical documentation of bivariate associations between parent-child security and children's peer representations (Cassidy et al., 1996), questions can be raised about whether our null findings of a comparable pathway may be (a) an artifact of measurement error or (b) a result of our novel inclusion of insecure representations of interparental and parent-child relations as simultaneous predictors. To address this question, we re-estimated the SEM in Figure 1 while constraining the path between insecure interparental relations and children's peer information processing to 0. Consistent with prior research in which parent-child representations were considered singly, the results revealed that insecure representations of parent-child relationships was a significant predictor of children's negative peer information processing, $\beta = .33$, $p < .01$. Taken together, inclusion of insecure representations of interparental relationships in the full model in Figure 1 resulted in a 48% drop in the magnitude of the standardized path between parent-child representations and peer information processing (i.e., drop from $\beta = .33$, $p < .01$, to $\beta = .17$, $p = .15$). Thus, the nonsignificant pathway between parent-child representations and peer information processing in the full model was largely the result of the shared variance between the two types of family representations.

Stability of Pathways as a Function of Gender

Given the possibility that child gender may moderate associations between children's reactivity to family discord and their adjustment (Davies & Lindsay, 2001), our final set of analyses examined if any of the structural paths among insecure interparental and parent-child representations, peer information processing, and child maladjustment differed as a function of child gender. Structural paths were statistically comparable across gender. Thus, gender did not serve as a moderator in the proposed meditational model.

Discussion

Guided by emotional security theory (EST), the primary purpose of the present study was to address the gap in the literature of precisely how children's insecure representations of the interparental relationship are associated with child school maladjustment. Although EST postulates that children's insecure interparental representations increase children's vulnerability to psychological adjustment problems, this study is the first to examine children's peer information processing as a viable mechanism for this association. Findings indicated that insecure interparental representations were associated with children's processing of negative peer events at Wave 1. In turn, children's negative representations at Wave 1 were associated with subsequent increases in children's school maladjustment from Wave 1 to Wave 2. These findings can be interpreted to support the notion that children's representations of peers are one class of processes that help to explain how children's concerns about their security in interparental contexts may undermine their adjustment.

In addressing the first part of the proposed indirect pathway, children's insecure representations of interparental relationships were associated with greater negative processing of provocative peer events as indicated by their tendencies to attribute hostile intent to peers, interpret peer emotions as reflecting negative motives, and endorse hostile behavioral responses to the provocation. Interpreted within EST, these results lend support to the notion that children's representations of the interparental relationship serve as analogs for detecting threats in other challenging interpersonal contexts (Davies, Winter, & Cicchetti, 2006). When faced with high levels of conflict in the home, children are specifically theorized to develop negative scripts characterized by largely unconscious rules heavily biased toward detecting, predicting, and interpreting potentially threatening scenes

(Johnston & Roseby, 1997). As indices of negative scripts, insecure internal representations of interparental relationships may serve as guides for scanning new peer contexts for old threats, especially when the contexts are stressful. Through this process, children who use these negative scripts to organize their processing in peer contexts are likely to experience multiple dimensions of hostile information processing of peers.

Another goal of this study was to determine whether insecure interparental representations have unique implications for child adjustment in relation to other representations of family relationships, children's dispositions to experience negative affect, and socioeconomic disadvantage. According to EST (Davies & Sturge-Apple 2007), children's insecurity in the interparental relationship is a system that is relatively distinct from other representational, socioemotional, and environmental liabilities. Thus, the derivative prediction is that a significant portion of the covariation between interparental representations and processing of peer events cannot be accounted for by other tendencies to experience or exhibit negative affect, behaviors, or social stressors. In supporting this prediction, the SEM results indicated that children's insecure representations of the interparental relationship continued to be uniquely related to hostile peer information processing even with the inclusion of insecure parent-child representations, psychological symptoms, and SES as predictors. In fact, the three alternative mechanisms were not significant predictors of peer information processing.

These results raise the question of why interparental representations played a distinct role in accounting for individual differences in how children process stressful peer events. At a structural level, one possible explanation is that representations of interparental relationships may be closer prototypes for peer relationships than indices of parent-child representations, global psychological symptoms, or socioeconomic processes. For example, interparental relationships more closely resemble children's peer relationships than parent-child relationships along dimensions of status characteristics (e.g., equal balance of power; similar age). Thus, in processing provocative peer events, children may rely more heavily on algorithms of identifying and interpreting threat that derived from interparental representations than other modes of processing that are rooted in general adjustment patterns or their interpretations of parent-child relationships.

Drawing on the ethology-based reformulation of EST (see Davies & Sturge-Apple, 2007; Davies & Woitach, 2008), another plausible explanation is that interparental and peer representations are closely coupled at the level of control systems. According to this theory, children's internal representations of each relationship reflect strategies that are largely organized by different ethological modules. Parent-child representations about the emotional quality and protective capacities of the parent-child relationship are postulated to be primarily tethered to the attachment system and its goal of increasing access to a protective caregiver. In contrast, the underlying apprehension about threat posed by angry caregivers in representations of interparental relationships are more closely tied to the social defense system and its goal of neutralizing interpersonal threat. Thus, to the extent that insecure representations of interparental relations reflect the development of individual differences in processing of perilous interpersonal contexts, children may rely on this same system in processing threats accompanying peer provocation. By the same token, the limited accessibility of attachment figures in peer settings may decrease the salience of the attachment system and its goal of maximizing the protection of a caregiver as children process and respond to threats associated with peer provocation.

Although the present findings did not support our complementary hypothesis that insecure parent-child representations would be uniquely associated with peer information processing in the context of interparental representations, the results should not be interpreted to suggest that children's internal representations of parent-child relations are unimportant in

understanding heterogeneity in children's processing of peer events. For example, Cassidy and colleagues (1996) documented associations between children's negative representations of parent-child relationships and their negative processing of provocative peer events without inclusion of interparental representations in their analyses. In a similar vein, the nonsignificant path between parent-child insecure representations and negative peer information processing in our full model became statistically significant after excluding interparental representations as a predictor in a follow-up analysis.

In integrating the present findings with prior work by Cassidy and colleagues (1996), one interpretation is that the shared variance between security systems in the interparental and parent-child relationships is a significant source of individual differences in children's peer information processing. For example, witnessing parents behave in a frightening way during an interparental disagreement may not only trigger children's social defense strategies to help protect themselves against harm, but it may also undermine children's confidence in their parents as sources of protection and support. Likewise, concerns about the availability of parents as sources of protection and support that are reflected in insecure parent-child representations may fuel doubts about the ability of the parents to manage their own problems in a way that minimizes threats to the child and family system. In further extending this interpretation, signs of insecurity in the parent-child relationship may be associated with other dimensions of peer information processing not assessed in our study. For example, Ziv and colleagues (2004) documented that child-mother attachment security was associated with the response evaluation stage of peer information processing but not with the interpretation of social cues or response generation. Accordingly, dimensions of peer information processing that are utilized to detect threat (i.e., interpretation of social cues, response generation) may be more strongly associated with the social defense system while aspects of peer information processing that require reflecting on one's interpretations and responses (i.e., response evaluation stage) are more closely linked with children's experiences with their attachment figure. In reflecting another possibility, earlier research has supported the thesis that children's tendencies to attribute negative intent to mothers may be outgrowths of their internal working models of parent-child relationships (MacKinnon-Lewis, Lamb, Hattie, & Baradaran, 2001). Thus, it is also possible that parent-child representations are indirectly associated with peer information processing by engendering hostile attributions of parents.

Of relevance to the second link in our hypothesized mediational model, the findings indicated that children's negative peer representations predicted decrements in children's academic functioning characterized by attention difficulties, poor academic performance, and lack of cooperative participation in classroom activities. Further supporting the role of peer processing as a mediator, the role of interparental representations as a prospective predictor of decreases in academic adjustment over the one-year period was no longer significant after inclusion of the path between peer information processing and children's academic functioning. In the aggregate, the identification of peer information processing as a more proximal predictor of academic functioning than representations of family relationships highlights the significance of peer mechanisms in the learning environments of children. Thus, the results are consistent with the premise that greater allocation of attentional resources toward identifying peer threats in the periphery of academic settings may undermine children's ability to achieve important educational tasks by disrupting children's attentional control, self-regulatory, and emotion regulation abilities (e.g., Pollack & Tolley-Schell, 2004). As a complementary interpretation, children's hostile information processing may also reflect a chain of unfolding social processes that may undermine children's academic functioning. For example, consistent with research by Buhs and colleagues (Buhs et al., 2006; Buhs, 2005; Buhs & Ladd, 2001), children who exhibit a hostile information processing style may evoke chronic peer rejection and abuse which, in

turn, may negatively impact children's engagement and achievement in the school environment.

Interpretation of the findings must also be balanced with a consideration of the limitations of the study. With regard to design and analysis issues, pathways among interparental security, peer information processing, and school adjustment tended to be modest in magnitude. Nonetheless, in the context of the multi-method, multi-informant, autoregressive models, even modest associations among family processes may be regarded as substantively powerful and meaningful. Moreover, although prior values of the latent constructs for children's school adjustment were statistically controlled through the specification of autoregressive paths, our two-wave longitudinal design precluded a similar autoregressive analysis of change in peer information processing. Therefore, we cannot rule out the possibility that children's negative peer information processing patterns may be coloring their representations of family relationships. Finally, even the autoregressive component of our model does not rule out the operation of extraneous third variables in accounting for mediational pathways. However, developmental models offer little or no guidance in the specification of the sensitive developmental lags under which children's processing of family relationships are theorized to alter peer information processing. Thus, given the paucity of knowledge on associations between negative representations of multiple relationships and children's peer information processing, this study provides an important step toward conducting prospective tests of the interplay between family and peer processing.

Various measurement limitations are also evident. Although story stems techniques are regarded as maximizing the validity of representational measures by virtue of their familiarity and engaging qualities with children (Bretherton et al., 1990; Jacobsen & Hoffman, 1997), the common method variance associated with using story stem assessments for multiple constructs may have artificially inflated associations among family representations and peer information processing. However, to reduce method variance, we specifically utilized methodologies for the MSSB-R and the Peer Information Processing Task that are differentiated in terms of the: structure of the interview (e.g., MSSB-R imposes notably less structure), the interview stimuli (e.g., cartoon stimuli versus action figures and props), the medium of the interview (e.g., transcripts of child verbalizations versus videotapes of child behaviors and verbalizations), the judges rating the representations (e.g., independent coding teams from different research sites), and the day of the assessment (i.e., conducted at two different lab visits). In addition, although our analysis of peer information processing in the context of instrumental provocations is comparable to other studies (Garner & Lemerise, 2007; Lemerise et al., 2006), expanding assessments to include other forms of provocation (e.g., relational provocation) is an important future direction (Crick, Grotpeter, & Bigbee, 2002).

Finally, caution should be exercised in generalizing the findings beyond our community sample. Differences were found between the present sample and participants who were excluded from this study. For example, relative to families who participated in the present study, excluded families were higher on two indices of insecure representations of parent-child relations (i.e., caregiver incompetence and overall felt insecurity). Thus, it is possible that the results for insecure parent-child representations obtained in the present study may differ in a sample in which children are higher on indices of parent-child insecurity.

Despite these limitations, the results break new ground in understanding how insecure representations of the interparental relationship are linked with subsequent child problems. Consistent with EST, the findings support the notion that children's representational models of family relationships, particularly marital relationships, are a significant class of processes

for understanding individual differences in children's socioemotional functioning and consequently their long-term development. Thus, the findings testify to the promise of explicating the cascade of psychological processes set in motion by children's representations of family relationships and its resulting implications for children's adjustment.

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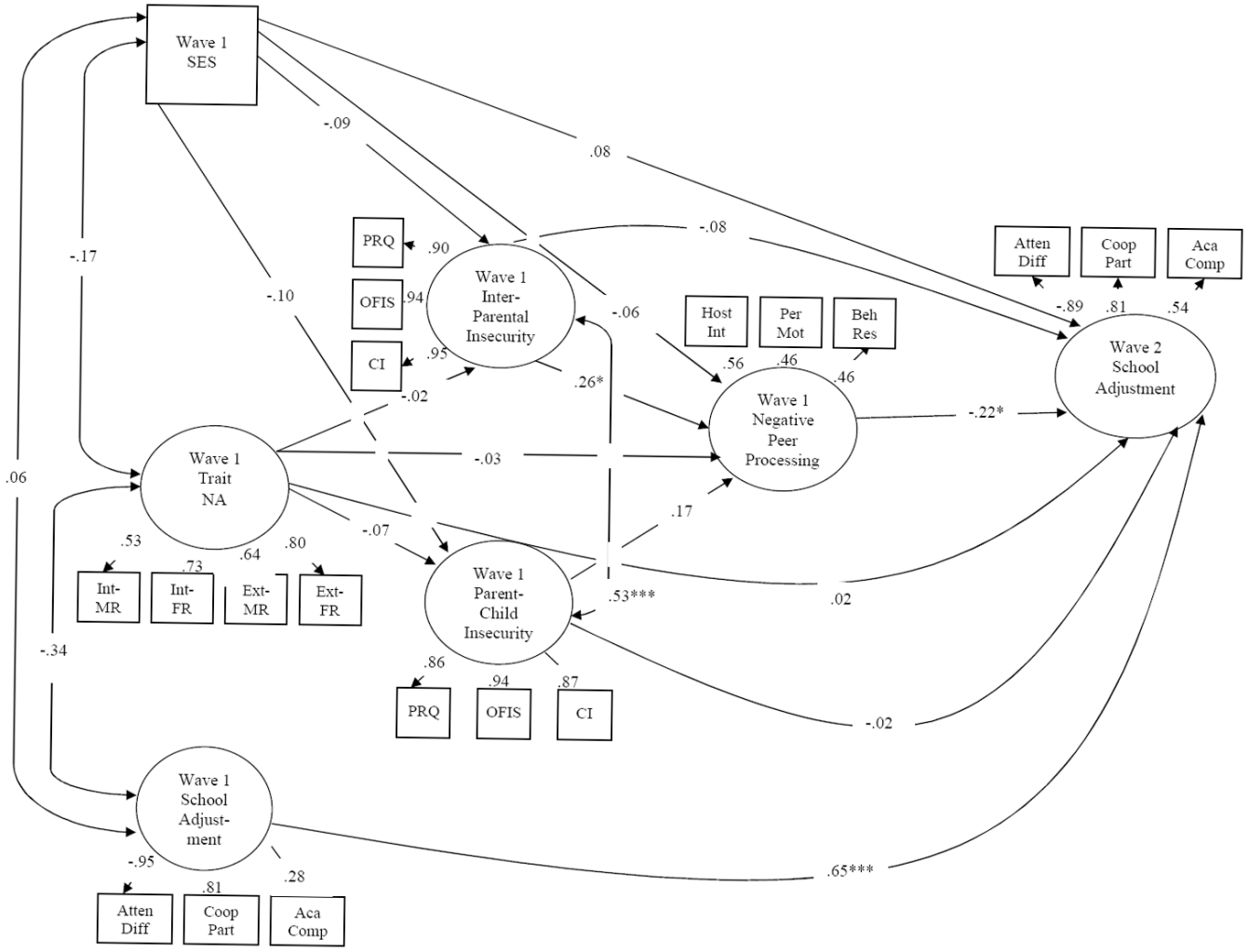

Figure 1.

A structural equation model testing child negative peer information processing as a mediating variable in associations between interparental and parent-child insecurity and child school adjustment controlling for covariates, SES and trait NA. PRQ = poor relationship quality, OFIS = overall felt insecurity, CI = caregiver incompetence, Host Int = hostile intent, Per Mot = perceived motives, Beh Res = behavioral response, Int = internalizing, Ext = externalizing, MR = mother report, FR = father report, Atten Diff = attention difficulties, Coop Part = cooperative participation, Aca Comp = academic competence. * $p < .05$, *** $p < .001$.

Table 1

Means, Standard Deviations, and Intercorrelations of the Main Variables in the Primary Analyses

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	*M*	*SD*
Wave 1																						
1. SES	-																				0.00	2.53
2. Marital PRQ	-.08	-																			2.59	0.75
3. Marital OFIS	-.10	.85	-																		2.73	0.74
4. Marital CI	-.08	.86	.89	-																	2.62	0.74
5. Parent PRQ	-.06	.32	.41	.34	-																2.48	0.58
6. Parent OFIS	-.07	.42	.54	.46	.82	-															2.44	0.61
7. Parent CI	-.11	.43	.52	.47	.76	.82	-														2.38	0.64
8. Hostile intent	-.11	.13	.17	.15	.09	.11	.03	-													2.79	1.23
9. Perceived motive	-.01	.15	.17	.14	.11	.15	.14	.32	-												2.92	0.61
10. Generation RES	.00	.14	.24	.20	.20	.25	.23	.23	.15	-											1.16	0.42
11. Mom Internalizing	.04	-.06	-.05	-.02	-.08	-.09	-.03	-.11	.12	-.05	-										5.16	4.93
12. Dad Internalizing	-.17	-.06	-.04	.02	-.15	-.15	-.05	-.13	-.02	.02	.45	-									5.63	4.74
13. Mom Externalizing	-.04	.02	.03	.03	.01	.00	.09	-.08	.07	.00	.63	.32	-								9.16	7.41
14. Dad Externalizing	-.18	.01	.02	.07	-.03	-.01	.05	-.02	.03	.03	.26	.65	.52	-							9.84	7.53
15. Attention DIFF	-.05	.23	.23	.24	.05	.15	.13	.06	.15	.17	.11	.13	.30	.29	-						5.40	2.07
16. Cooperative PART	.08	-.23	-.27	-.27	-.12	-.22	-.17	-.07	-.15	-.14	-.06	-.13	-.24	-.30	-.77	-					12.11	2.59
17. Academic COMP	.00	-.15	-.16	-.17	-.12	-.15	-.15	-.09	-.14	-.16	.00	-.20	-.09	-.16	-.26	.22	-				4.89	2.35
Wave 2																						
18. Attention DIFF	-.12	.32	.29	.29	.12	.23	.17	.16	.11	.24	.01	.05	.22	.23	.57	-.50	-.17	-			5.26	1.86
19. Cooperative PART	.12	-.24	-.24	-.20	-.16	-.22	-.18	-.12	-.19	-.27	-.05	-.01	-.21	-.18	-.54	.55	.11	-.73	-		11.92	2.76
20. Academic COMP	.08	-.31	-.23	-.24	-.16	-.10	-.11	-.15	-.11	-.21	-.05	-.09	-.04	-.11	-.35	.32	.44	-.50	.44	-	5.24	2.48

Note. PRQ = poor relationship quality, OFIS = overall felt insecurity, CI = caregiver incompetence, RES = response, DIFF = difficulties, PART = participation, COMP = competence. Correlations ≥ |.14| are significant at the $p < .05$ level.