# Beyond Warmth and Conflict: The Developmental Utility of a Boundary Conceptualization of Sibling Relationship Processes

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## Abstract

Translating relationship boundaries conceptualizations to the study of sibling relationships, this study examined the utility of sibling enmeshment and disengagement in predicting child adjustment difficulties in a sample of 282 mothers and adolescents (Mean age = 12.7 years). Mothers completed a semi-structured interview at the first measurement occasion to assess sibling interaction patterns. Adolescents, mothers, and teachers reported on children's adjustment problems across two annual waves of assessment. Supporting the incremental utility of a boundary conceptualization of sibling relationships, results of latent difference score analyses indicated that coder ratings of sibling enmeshment and disengagement uniquely predicted greater adolescent adjustment difficulties even after taking into account standard indices of sibling relationship quality (i.e., warmth, conflict) and sibling structural characteristics (e.g., sex).

Sibling relationships serve as key contexts of socialization in the lives of children (Brody, 2004; Dunn, 2007). Research has consistently documented that sibling warmth is associated with higher levels of competence and diminished risk for internalizing and externalizing symptoms (Kim, McHale, Crouter, & Osgood, 2007; Richmond, Stocker, & Rienks, 2005). Conversely, high levels of sibling conflict have been associated with greater vulnerability to a wide range of psychological problems (Garcia, Shaw, Winslow, & Yaggi, 2000; Moser & Jacob, 2002). Decisions to focus on constructs of warmth and conflict have been largely based either implicitly or explicitly on social learning theory principles (Stocker & Youngblade, 1999; Volling & Blandon, 2005). Although this corpus of work has been extremely valuable in advancing an understanding of the developmental implications of sibling relationships, the predominant use on any single theory as a guide to research is likely to constrain a full understanding of sibling relationship processes. Towards increasing the conceptual breadth and richness in models of sibling relationships, the goal of this study is to introduce and test the incremental value of a new conceptual approach to understanding the developmental implications of sibling relationship quality. Drawing from family systems theory, we aim to expand the traditional focus on warmth and conflict by further differentiating sibling relationship quality based on the concept of boundary disturbances, defined by aberrations in implicit relationship rules of transmitting information and resources (Cox & Paley, 1997; Minuchin, 1985).

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Originally developed in the context of structural family therapy (Minuchin, 1974), boundary disturbance conceptualizations have been successfully applied at an empirical level to understand both family system and subsystem (e.g., parent-child) dynamics (e.g., Jacobvitz, Hazen, Curran, & Hitchens, 2004; Sturge-Apple, Davies, & Cummings, 2010). Enmeshment and disengagement have been identified as the two most common boundary disturbance patterns in family relationships (Davies, Cummings, & Winter, 2004). Enmeshed relationships are characterized by underdeveloped, dispersive boundaries. Although these relationships may appear to have some degree of affection and warmth, intimacy and affiliation are achieved at the cost of autonomy, individuality, and a balanced consideration of other important goals (e.g., exploration, peer relations) (Barber & Buehler, 1996). High levels of emotional and psychological entanglement can be manifested in many forms, including inappropriately assuming the role of parent or caretaker (e.g., overly protective care-giving role), experiencing conditional or contingent warmth that co-occurs with high levels of controlling, dominant, and power-assertive behaviors, and heavily relying on the sibling relationship to achieve certain goals (e.g., affiliation, protection).

Although enmeshed relationships may confer some developmental advantages under specific conditions, family systems theory proposes that enmeshment increases children's risk for internalizing symptoms by coaxing or coercing the child into a single or narrow set of relationships that undermines autonomy (e.g., Minuchin, 1985). The ensnared nature of these relationships are further theorized to present formidable challenges to developing social skills necessary for successfully establishing and maintaining high quality peer relationships. In support of the potential utility of the enmeshment construct for the study of sibling relationships, Hetherington (1988) identified an enmeshed subsample of siblings that she described as "spend[ing] little time playing with other children, most of their time with each other, were interdependent and asked each other's advice on most issues, and were fiercely protective of each other" (p. 326). Consistent with her interpretation that this dynamic reflected an unhealthy or pathologically intense, symbiotic, and restrictive relationship, Hetherington (1988) reported that children in enmeshed sibling relationships exhibited elevated levels of internalizing problems and peer neglect. Guided by this work and the broader research on boundary conceptualizations in the larger family unit (e.g., Davies et al., 2004; Jacobvitz et al., 2004; Sturge-Apple et al., 2010), we hypothesized that sibling enmeshment would be a specific risk factor for adolescents' internalizing symptomatology and social problems.

Alternatively, disengaged relationships reflect thick, impermeable, or overly rigid boundaries that afford little or no access to warmth, support, or other relationship resources. The interpersonal distance in disengaged relationships is reflected in cold, indifferent, callous, or unfriendly interactions. Although hostility is commonly evident in disengaged relationships, it does not share the same function as enmeshment in creating greater emotional entanglement. Rather, the hostility and anger characteristic of disengagement serves to further push the siblings apart or promote psychological distance between them. Although disengaged relationships may have some adaptive benefits (e.g., limiting exposure to incompatible relationships), the emotionally cold and indifferent climate of sibling relationships has been theorized to increase tendencies to downplay the significance of relationships and engender a dismissing pattern of coping characterized by interpersonal disregard, rejection, alienation, and externalizing problems (Davies et al., 2004; Kerig, 1995; Sturge-Apple et al., 2010). Supporting the prevalence and proposed implications of sibling disengagement, Hetherington (1988) identified a "hostile alienated" group of siblings who "avoided each other's company as much as possible and were cold or actively complaining, critical, and aggressive when they did interact (p. 327)" and exhibited elevated externalizing symptomatology. Therefore, we further postulate that sibling disengagement will evidence distinct associations with adolescents' externalizing problems.

Our distinction between boundary disturbances is designed to generate incremental precision and novelty in the prediction of children's adjustment beyond the broad discrimination of sibling relationships into inherently positive (e.g., warmth) and negative (e.g., conflict) units. Consideration of both form and function in defining sibling relationship behaviors is specifically intended to obtain a different level of understanding of how children experience sibling relationships than social learning theory approaches. Defining warmth and conflict according to its phenotypical or structural characteristics does not specifically permit an understanding of the psychological meaning of these classes of behaviors within the broader organization of relationship behaviors and the overarching implicit rules of relating in the sibling dyad. For example, although some displays of warmth are manifestations of generally healthy, close sibling relationships, other apparent expressions of friendliness may reflect conditional attempts to entangle siblings in ways that undermine salient developmental goals (see Byng-Hall, 2002, Erel & Burman, 1995). Likewise, previous unidimensional treatments of conflict or hostility in the sibling literature cannot disentangle whether hostility serves the function of emotionally entangling (i.e., enmeshment) or estranging (i.e., disengagement) siblings. If a boundary disturbance model of sibling relationships is distinctive in its utility as family systems theory postulates, then it should offer incremental power in accounting for individual differences in children's adjustment even after considering the predictive role of prevailing measures of warmth and conflict. To provide a stringent test of the discriminant validity of our boundary disturbance conceptualization, we specifically examined whether sibling enmeshment and disengagement uniquely predicted adolescents' psychological adjustment patterns in analytic models that simultaneously considered sibling warmth and conflict as predictors.

Because emerging evidence suggests that early adolescence may be a sensitive period for exhibiting susceptibility to sibling relationships, we examined the viability of our sibling disturbance model within a sample of young teens. As children navigate through the early period of adolescence, they must face the challenge of resolving a significant number of stage-salient tasks, including the development of close friendships characterized by high levels of intimacy, self-disclosure, and autonomy support (Brendgen et al., 2002), supportive peer networks (Connolly, Furman, & Konaski, 2000), social perspective taking skills (Furman & Wehner, 1994), successfully coping with environmental (e.g., school) and biological (e.g., puberty) transitions (Gest, Reed, & Masten, 1999), and effective approaches for risk (e.g., substance use, sexual relations, delinquency) management (Windle & Davies, 1999). Given that these tasks are already challenging even within highly nurturing contexts, developmental models propose that patterns of adolescent adaptation emerging from the resolution of developmental tasks may be highly sensitive to the family relationship dynamics (Cummings, Davies, & Campbell, 2000). Sibling relationships may be particularly salient in this developmental context due to their considerable comparability with many of the peer relationship challenges (e.g., intimacy, disclosure, autonomy support in friendships and peer networks) in early adolescence. For example, sibling relationships closely resemble peer and friend relationships along key structural characteristics, including relatively equal balance of power and age similarity (Laursen, 1995; Sroufe, Egeland, Carlson, & Collins, 2005). Thus, adolescents may rely substantially on the sibling relationship experiences as prototypes for approaching many of the developmental tasks that underlie trajectories of adaptation and maladaptation.

Several methodological features in this study were employed to increase the rigor in testing the primary hypotheses. First, prompted by the predominant use of questionnaire assessments of sibling relationship quality (e.g., Hetherington, 1988), researchers have issued calls to develop a more diverse array of assessments (Noller, 2005). Highlighting a pivotal approach to addressing this gap, Fiese and Spagnola (2005) argue that semi-structured interviews can provide a deep level of understanding of complex family processes

by offering opportunities for individuals to impart personal meaning in responding to questions. Toward this objective, a new semi-structured interview was developed for caregivers designed to allow greater latitude in addressing central themes in their children's sibling relationships than the fixed items and response alternatives of questionnaires. The resulting rich narratives on sibling dynamics increase versatility in measurement by affording both conventional (e.g., warmth, conflict) and novel (e.g., enmeshment, disengagement) assessments of sibling relationship dimensions. Second, our assessment of sibling relationships is also part of a broader measurement approach that circumvents the common limitation of shared method and informant variance by utilizing multiple methods (i.e., semi-structured interview, questionnaires) and informants (i.e., expert raters, parents, adolescents, teachers). Third, our aim was to extend the promising cross-sectional findings in earlier research (Hetherington, 1988) by utilizing a prospective design to test whether sibling boundary disturbances predicted subsequent change in adolescent adjustment even after inclusion of sibling warmth and conflict as predictors. As a conservative approach, a number of structural characteristics (e.g., sex, age) of the sibling dyad were specified as potential covariates in the models (Branje et al., 2004; Brody, 1998; Hetherington, 1988).

## Method

### Participants

Data for this study were collected as part of a larger, multi-method, longitudinal project examining interrelationships between family conflict and children's coping and adjustment in a sample of mothers, fathers, and their adolescent children. The sample was 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. Toward the goal of obtaining a sample that was relatively representative of the U.S. regions, specific efforts were dedicated toward recruiting through school districts and community agencies serving racially, ethnically, and socioeconomically diverse families. The original study contained six measurement occasions. Due to the timing of the administration of the sibling assessment, data for the current study were drawn from the annual assessments marking the fourth and fifth measurement occasions of the larger study. For clarity of presentation, the measurement occasions are designated as the first and second waves for the remainder of the paper.

At the first wave, participants for the current paper included 282 mothers and adolescents who had siblings. Adolescents were in seventh grade and, on average, 12.67 years ($SD$ = .59) at Time 1. The sample consists of relatively equal proportions of females ($n$ = 143) and males ($n$ = 139). For adolescents with more than one sibling, the sibling closest in age to the adolescent was used for analyses. The mean age of siblings was 12.76 years ($SD$ = 3.81; range = 2 to 27 years old). In spite of the wide age range of the siblings, 90% of adolescents and their siblings were no more than 5 years apart with the average age span being 3.12 years ($SD$ = 2.20). The developmental status of target adolescents in relation to their siblings was relatively evenly distributed, with target adolescents being older than the siblings in 51.4% of the dyads and younger in 47.2% of the dyads and identical ages in 1.4% of the dyads. Sibling dyads were divided fairly evenly with regard to the distribution of child sex: 137 same sex pairs (i.e., 63 male/male pairs; 74 female/female pairs) and 145 opposite sex pairs. The sample included 78 older sister/younger sister pairs, 69 older brother/younger brother pairs, 61 older sister/younger brother pairs, 70 older brother/younger sister pairs, 2 sets of boy/girl dizygotic twins, 1 set of girl monozygotic twins, and 1 set of triplets entailing two girls and 1 boy. Approximately 33% of target adolescents were first-born children, 32% were second-born, 15% were third-born, and the remaining 20% were later-born children. The majority of sibling dyads were full biological siblings (89.2%) followed

by smaller percentages of half-siblings (4.7%), step-siblings (1.8%), adopted (2.5%), and other (1.8%). Most adolescents lived with the target sibling (90.7%).

Mean age of mothers was 41.71 years ($SD = 5.97$). Median annual household income of families was between $55,000 and $74,999. On average, mothers completed some college (47% of sample) with 53% of the sample obtaining an associate's degree or higher. A large proportion of the sample was European American (78.9%), followed by smaller percentages of African American (16.2%), Biracial (3%), and other racial families (1.9%). The majority of adolescents (92.6%) lived with their biological mother, 3% with an adoptive mother, 1.1% with a stepmother, and 3.3% with some other female guardian. In addition, adolescents lived with their biological father in most cases (78.8%) followed by smaller percentages living with a step-father (12.7%), adoptive father (3.7%), or some other male guardian (4.8%).

The retention rate from Time 1 to Time 2 was 90%. Therefore, we conducted statistical comparisons between families participating at both time points and families who were lost to attrition along thirteen demographic variables (e.g., adolescent and maternal race and ethnicity, family income, maternal educational attainment, adolescent and sibling sex and age) and the twelve primary variables reflecting sibling relationship quality and adolescent outcomes. The number of significant comparisons (1 out of 25) was below what would be expected by chance (5%). Relative to adolescents who remained in the study, adolescents who were lost to attrition were, on average, lower on sibling warmth. In light of the non-selective nature of attrition, we utilized the EM algorithm for estimating the missing data to retain the full sample (Baraldi & Enders, 2010; Enders, 2001).

## Procedures

Data for the present study were gathered at two measurement occasions spaced one year apart. At each time point, mothers and their adolescents visited one of the research sites two times for approximately two to three hours. Both sites contained interview rooms for completing confidential interview and survey measures. The study was conducted at both data collection sites with the approval of the Institutional Review Boards.

**Sibling interview**—A trained experimenter administered the Sibling Interview for Mothers (SIM), a semi-structured interview with the mother designed to assess the quality of sibling relationships in childhood. Although the interview can be used to assess multiple sibling relationships, we followed conventional procedures for assessing sibling relationships in this paper by focusing on maternal narratives about the quality of adolescents' relationships with their closest aged sibling (e.g., Kim et al., 2007; Modry-Mandell, Gamble, & Taylor, 2007; Volling & Blandon, 2005). The interview, which takes approximately 20 minutes to administer, contains questions regarding multiple social and emotional dimensions of sibling relationship dynamics. In the first part of the interview, interviewers asked the mothers to rate the level of closeness in the sibling dyad on a 5-point scale ranging from (1) not close at all to (5) extremely close. To facilitate the development of a rich narrative, interviewers followed up the question by asking mothers to explain why they selected the specific closeness rating. In the middle portion of the interview, mothers responded to more specific questions about the nature and substance of sibling interactions. Specific questions included: "What does a typical interaction between them look like?" and "What sorts of things do they typically talk about when they're together?" In the concluding section of the interview, the focus is on understanding the frequency and nature of challenges and disagreements in the sibling relationships. Mothers first provided ratings of conflict frequency on a seven-point scale ranging from 0 (never) to 7 (several times of day). Ratings were followed by specific questions designed to delineate key parameters of

conflicts and disagreements, including their relational origins (i.e., "Why do you think they typically get into conflicts?), onset ("How do conflicts typically start?"), course ("Describe what happens next?;" "Is there anything else that typically happens before the conflict ends?"), and endings ("How do conflicts typically end?").

Although the majority of mothers provided detailed, rich narratives to substantiate their answers, it was necessary on some occasions to introduce probes to clarify vague or underdeveloped responses (e.g., "they do things together," "they don't get along"). Therefore, specific sets of probes were developed in order to facilitate clear, complete answers in a non-leading way (e.g., "What types of things do they do together?" "Can you elaborate on that?" "Can you give me specific examples that would illustrate…?"). Because mothers were reporting on their observations of sibling relationships, probing was also performed to clarify how mothers knew the information being provided (e.g., "How can you tell they enjoy spending time together?"). Audiotape records of the interview were obtained for subsequent coding.

**Adolescent adjustment questionnaires—**Adolescents, mothers, and classroom teachers independently completed questionnaires to assess adolescent adjustment at Times 1 and 2.

### Measures

**Sibling relationship characteristics (Time 1)—**Three coders, who were trained to reliability, were randomly assigned to independently code the SIM. For the sake of comparability, conventional (i.e., warmth, conflict) and boundary disturbance (i.e., enmeshment, disengagement) parameters of sibling relationships were coded using a molar rating scale ranging from (0) "none" to (3) "high". Each point along continuum contained descriptive anchors to guide the coder. Thus, at one extreme, (0) "none" reflected that the narrative contained no evidence that the dyadic characteristic was present, whereas (3) "high" reflected clear, direct evidence of a prototypical illustration of the relationship parameter. The sibling boundary disturbance coding scheme was designed to complement other family relationship approaches that form relationship dimensions based on morphological characteristics of behaviors (e.g., warmth, caretaking, aggression) of individuals in the dyad. Consistent with the boundary concept in family systems theory, the aim of the system was to understand the psychological function or meaning of the overall organization of dyadic reciprocal behaviors within the dyad.

*Enmeshment* was defined by psychological and emotional entanglement that serves to undermine adolescent autonomy and achievement of other developmental goals. Common manifestations of enmeshment include dispositions toward parentification (i.e., taking on caretaker role), exclusive or heavy reliance on the sibling relationship to achieve certain goals (e.g., affiliation, protection), and the experience of conditional warmth interspersed with high levels of controlling, dominant, or power-assertive behavior. In contrast, the *disengagement* code was designed to index overly rigid or thick relationship boundaries that undermine access to closeness, support, and other interpersonal resources. Thus, disengagement can range from portrayals of sibling relations as indifferent, cold, apathetic, aloof, and unfriendly to displays of hostility that serve to promote psychological distance between the siblings Thus, disengagement can range from portrayals of sibling relations as indifferent, cold, apathetic, aloof, and unfriendly to displays of hostility that serve to promote psychological distance between the siblings (excerpts of maternal interviews are included in the appendix—available online at XX_W-B Library URL_XX—to illustrate examples of high ratings on sibling disengagement and enmeshment codes. Names have

been altered in the narratives to protect the confidentiality of the participants. Other examples are available from the first author upon request.)

Following previous conceptual and operational definitions of sibling relationships (Cole & Kearns, 2001; Volling & Blandon, 2005), the *warmth* code assessed the level of sibling closeness and intimacy. Specific manifestations of warmth included verbal expressions of fondness, physical affection, conversations about intimate issues, sharing of common interests, mutual play, prosocial behavior, and plans to maintain or strengthen the relationship. The *conflict* code was designed to assess destructive fighting based on consideration of the nature, frequency, and intensity of disagreements. Thus, at high levels, conflict consisted of frequent occurrences of escalating and hostile (e.g., physical fighting) behaviors that likely have significant and pernicious implications for the quality of the sibling relationship. Intraclass correlation coefficients, reflecting interrater reliability among the three coders on 20% of the interviews, were acceptable: enmeshment (.76), disengagement (.83), warmth (.86), and conflict (.92).

**Adolescent adjustment (Times 1 and 2)**—Because adult observers achieve sufficient levels of agreement in reporting overt psychological difficulties, our approach consisted of obtaining multiple informant reports of adolescent externalizing problems and social difficulties in order to form multi-informant latent constructs. By the same token, adult informants experience substantial difficulty providing valid reports of adolescent internalizing difficulties due to their veiled, inconspicuous symptoms. Therefore, following conclusions that adolescents are the most accurate informants of their internalizing problems (Flanery, 1990; Grych, Seid, & Fincham, 1992), we utilized multiple adolescent reports of their internalizing symptomatology.

For internalizing problems, three measures were obtained from adolescents in order to form latent constructs at each time point. First, adolescents completed the *Emotional Symptoms* subscale from the Self-Report Strengths and Difficulties Questionnaire (SDQ, Goodman, 2001). The scale consisted of five items (e.g., "I am often unhappy, downhearted, or tearful"), rated on a three-point Likert scale ranging from 0 (*not true*) to 2 (*certainly true*). Second, adolescents reported on 28 items comprising the *Total Anxiety* scale from the Revised Child Manifest Anxiety Scale (RCMAS). Items (e.g., "I am nervous") were rated using the standard "yes" or "no" format (Reynolds & Richmond, 1979). Third, the Center for Epidemiological Studies Depression Scale (*CES-D*) contained 20 items designed to measure adolescent self-reported depressive feelings and behaviors during the past week (e.g., "I felt depressed"). Each item was rated on a 4-point rating scale ranging from 1 (*rarely or none of the time – less than once a week*) to 4 (*most or all of the time- 5–7 days*) (Radloff, 1977). Reliability and validity of these three measures were supported by several studies (see Goodman, Meltzer, & Bailey, 2003; Reynolds & Richmond, 1979; Radloff, 1991). Internal consistencies of the three instruments at each measurement occasion were satisfactory (.73 to .85 at Time 1 and .77 to .84 at Time 2).

For the triangulated assessment of adolescent externalizing symptoms, teachers and mothers completed the *Delinquent* scales (e.g., "breaks rules") from the respective Teacher Report Form and Child Behavior Checklist instruments (Achenbach, 1991). The *Delinquent* scales from the TRF and CBCL contained ten and fourteen items, respectively. A few items were not included due to the sensitive nature of the questions (e.g., uses alcohol or drugs). The third indicator of externalizing problems was obtained from adolescent reports on the *Conduct Problems* ("I fight a lot") subscale of the SDQ. Internal consistencies for teacher, mother, and adolescent reports ranged from .66 to .73 at Time 1 and .66 to .81 at Time 2.

Finally, the latent construct of adolescent social problems consisted of two indicators: maternal and teacher reports on the *Social Problems* subscales (e.g., "Teased") of the respective CBCL and TRF questionnaires. Both the CBCL and TRF have demonstrated internal consistency, test-retest reliability, and convergent and discriminate validity (Achenbach, Dumenci, & Rescorla, 2003). Internal consistencies for teacher and mother reports in the current study ranged from .75 to .82 at Time 1 and .75 to .79 at Time 2.

**Covariates: Sibling demographics—**Demographic characteristics assessed as covariates in the analyses included adolescent and sibling age, developmental status of adolescent (younger = 0; older = 1), adolescent and sibling sex (0 = boys, 1= girls), sibling co-residency (i.e., 1 = live together; 0 = do not live together), and genetic relatedness. Genetic relatedness was rated on a 3-point scale based on the degree of relatedness ("biological" = 3, "half" = 2, "step, adopted, or other" = 1).

## Results

Table 1 presents the means, standard deviations, and the correlations among the sibling relationship quality and adolescent adjustment variables. Analysis of the specific distribution of scores for enmeshment and disengagement revealed that moderate (2) to high (3) ratings of enmeshment and disengagement occurred in approximately 8% and 20% of the sibling dyads, respectively. These percentages correspond closely to the identification of two similar sibling profiles in findings from a cluster analysis conducted by Hetherington (1988): an enmeshed profile consisting of less than 10% of the sibling dyads and a hostile-alienated profile that contained approximately 22% of the siblings in the sample and closely resembled features of the sibling disengagement construct. Because sibling enmeshment and disengagement evidenced modest skewness, logarithmic transformations were conducted to normalize their distributions (Tabachnick & Fidell, 1996). The transformed variables were utilized in the correlational analyses in Table 1 and in all primary analyses. As denoted by the bolded correlations in Table 1, all manifest indicators of the proposed latent constructs were significant, in the expected direction, and generally moderate to high in magnitude: T1 and T2 internalizing symptoms (mean $r$s = .61 and .65, respectively), T1 and T2 externalizing difficulties (mean $r$s = .34 and .42, respectively), and T1 and T2 social problems (mean $r$s = .44 and .50, respectively). As expected, the correlational analyses revealed that sibling warmth and conflict evidenced some significant relationships with adolescent adjustment at both time points. Likewise, sibling enmeshment and disengagement were also significantly associated with adolescent adjustment problems across the time points. Among the four sibling variables, only enmeshment was significantly associated with adolescent internalizing symptoms.

### Model Testing Procedures

Latent difference score (LDS) modeling was utilized through the Amos 17.0 statistical software (Arbuckle, 2008) to test hypothesized models. LDS analyses specifically permitted the modeling of interindividual differences in intraindividual change for the three adolescent patterns of psychological problems (McArdle, 2009). Each form of adolescent maladjustment (i.e., internalizing, externalizing, and social problems) was analyzed in separate LDS models. To evaluate the initial fit of the multi-indicator latent constructs and change indices in adjustment over time, we conducted unconditional LDS models for each form of adolescent adjustment difficulties prior to the inclusion of the covariates and predictors. In all three models, correlations were specified between residual error variances of corresponding cross-lag manifest indicators.

The results of the three models are depicted in Figures 1a, 1b, and 1c. All of the models provided a satisfactory representation of the data: (1) $\chi^2$ (7, $N$ = 282) = 16.98, $p < .05$, $RMSEA$ = .07, $CFI$ = .99, $\chi^2/df$ ratio = 2.43 for internalizing symptoms; (2) $\chi^2$ (7, $N$ = 282) = 14.66, $p < .05$, $RMSEA$ = .08, $CFI$ = .99, $\chi^2/df$ ratio = 2.93 for externalizing symptoms; and (3) $\chi^2$ (2, $N$ = 282) = 4.68, $p$ = .096, $RMSEA$ = .07, $CFI$ = .99, $\chi^2/df$ ratio = 2.34 for social problems (Browne & Cudeck, 1993; Kline, 2005). In further support of the measurement model, factor loadings for the manifest indicators of the latent constructs in the unconditional LDS models were all significant ($p$s < .001), in the expected direction, and moderate to high in magnitude (range from .45 to .84, $M$ = .70). As denoted in the figures, the variances of the latent intercept and mean difference factors were significant for each of the forms of adjustment difficulties, thereby indicating that there were significant individual differences in children's initial levels of problems and mean changes in problems from Time 1 to Time 2.

Given our aim of examining relationships between sibling relationship dynamics and individual differences in adolescent adjustment, we proceeded to examine sibling predictors of initial levels of and changes in maladjustment through a three-step procedure. To evaluate the comparability of our findings with prior sibling studies that examine warmth and conflict in separate analyses (e.g., Branje et al., 2004; Kim et al., 2007), the first step consisted of examining the two conventional sibling constructs as predictors of the Time 1 latent construct of adjustment and the latent change in adjustment in successive models with the seven demographic variables included as covariates (i.e., Model 1a for conflict and Model 1b for warmth in Tables 2, 3, and 4). Due to the moderate association between the boundary disturbance measures ($r$ = .33), the second set of analyses involved simultaneously estimating predictive paths for sibling enmeshment and disengagement. In conjunction with the specification of the seven demographic covariates as predictors, the analyses were designed to examine whether boundary patterns evidenced specificity in the prediction of adolescent psychological problems (i.e., Model 2 in Tables 2, 3, and 4). For these analyses, we constrained predictive paths involving sibling warmth and conflict from the first step to 0. Finally, if sibling enmeshment or disengagement were significant predictors of adolescent adjustment difficulties in the second analytic step, we proceeded to the third analytic step of examining whether the boundary patterns provided any incremental and unique leverage in accounting for individual differences in adolescent psychological problems by simultaneously estimating predictive paths involving sibling warmth, conflict, and the demographic variables (i.e., Model 3 in Tables 2, 3, and 4). Tables 2, 3, and 4 provide the standardized coefficients for the paths among the sibling predictors and each of the forms of adolescent adjustment difficulties. In all of the analytic models, correlations were specified among all the predictor variables, but are not shown in the table for clarity of presentation.

## Paths Among Sibling Characteristics and Adolescent Internalizing Problems

Models 1a and 1b in Table 2 provided an adequate representation of the data: $\chi^2$ (55) = 108.62, $p < .001$, $RMSEA$ = .06, $CFI$ = .97, $\chi^2/df$ ratio = 1.98 and $\chi^2$ (55) = 110.98, $p < .001$, $RMSEA$ = .06, $CFI$ = .97, $\chi^2/df$ ratio = 2.02, respectively. As expected, conflict predicted greater concurrent levels of internalizing problems, $\beta$ = .13, $p$ = .05. No other significant associations involving sibling warmth and conflict emerged. The second model estimating sibling enmeshment and disengagement as predictors (i.e., Table 2, Model 2) provided a good representation of the data, $\chi^2$ (53) = 99.56, $p < .001$, $RMSEA$ = .06, $CFI$ = .97, $\chi^2/df$ ratio = 1.88. Consistent with predictions, enmeshment uniquely predicted subsequent change in adolescents' internalizing problems from Time 1 to Time 2, $\beta$ = .22, $p$ < .01. No other significant associations were found among disengagement or enmeshment and adolescents' internalizing symptoms.

Model 3 in Table 2 fit the data well, $\chi^2 = (51) = 91.50$, $p < .001$, *RMSEA* = .05, *CFI* = .98, $\chi^2/df$ ratio = 1.79. The results showed that enmeshment continued to predict subsequent increases in adolescents' internalizing symptomatology, $\beta = .26$, $p < .001$, even after estimating the predictive paths involving sibling warmth, conflict, and demographic factors. Sibling conflict continued to predict initial levels of adolescent internalizing problems ($\beta = .15$, $p < .05$). Sex of the target adolescent and co-residency status evidenced consistent associations with internalizing symptoms. Specifically, girls, on average, reported more internalizing symptoms at Time 1 than did boys and adolescents who lived with their sibling demonstrated decreases in internalizing problems over time relative to adolescents who did not live with their sibling.

## Paths Among Sibling Characteristics and Adolescent Externalizing Problems

Models 1a and 1b in Table 3 provided an adequate representation of the data: $\chi^2 (55) = 134.14$, $p < .001$, *RMSEA* = .07, *CFI* = .95, $\chi^2/df$ ratio = 2.44 and $\chi^2 (55) = 131.65$, $p < .001$, *RMSEA* = .07, *CFI* = .95, $\chi^2/df$ ratio = 2.39, respectively. Consistent with predictions, sibling conflict predicted initial levels of externalizing problems, $\beta = .23$, $p < .01$, whereas warmth negatively predicted initial levels of ($\beta = -.17$, $p < .05$) and decreases in ($\beta = -.24$, $p < .05$) externalizing symptoms from T1 to T2. Model 2 in Table 3 offered a satisfactory representation of the data, $\chi^2 (53) = 127.29$, $p < .001$, *RMSEA* = .07, *CFI* = .95, $\chi^2/df$ ratio = 2.40. As expected, sibling disengagement uniquely predicted subsequent change in adolescents' externalizing behaviors, $\beta = .27$, $p < .05$. No other significant associations were found between the sibling boundary patterns and externalizing difficulties. Model 3 resulted in an adequate model fit, $\chi^2 (51) = 102.18$, $p < .001$, *RMSEA* = .07, *CFI* = .95, $\chi^2/df$ ratio = 2.36. Disengagement predicted change in adolescents' externalizing symptomatology even after taking into account the other predictive paths in the model, $\beta = .34$, $p < .05$. Sibling conflict and warmth continued to predict initial levels of externalizing symptoms, $\beta = .24$, $p < .01$ and $\beta = -.21$, $p = .05$, respectively.

Four sibling demographic characteristics were consistently associated with child externalizing symptoms. First, adolescent boys, on average, exhibited more externalizing problems than did adolescent girls. Second, adolescents with older siblings evidenced subsequent decreases in externalizing symptoms. Third, adolescents who were more biologically related to their sibling exhibited lower initial levels of and decreases in externalizing symptoms from T1 to T2. Fourth, adolescents who lived with their sibling displayed decreases in externalizing behaviors relative to adolescents who did not reside with their sibling.

## Paths Among Sibling Characteristics and Adolescent Social Problems

Models 1a and 1b of Table 4 fit the data well: $\chi^2 (27, N = 282) = 54.21$, $p < .01$, *RMSEA* = .06, *CFI* = .98, $\chi^2/df$ ratio = 2.01 and $\chi^2 (27, N = 282) = 48.8$, $p < .05$, *RMSEA* = .05, *CFI* = .98, $\chi^2/df$ ratio = 1.67, respectively. Conflict marginally predicted initial levels of adolescent social problems, $\beta = .12$, $p = .08$ while warmth was a significant predictor of lower initial social problems, $\beta = -.13$, $p < .05$, and decreases in social difficulties from T1 to T2, $\beta = -.21$, $p < .05$. Model 2 of Table 4 yielded satisfactory fit indices, $\chi^2 (25, N = 282) = 36.33$, $p = .07$, *RMSEA* = .04, *CFI* = .99, $\chi^2/df$ ratio = 1.45. Enmeshment uniquely predicted subsequent increases in adolescents' social problems, $\beta = .23$, $p < .05$. Moreover, although disengagement was unrelated to change in adolescents' social difficulties, it significantly predicted initial levels of social difficulties, $\beta = .17$, $p < .05$. Given that both sibling boundary patterns were related to social problems in the second analytic step, our final analytic step consisted of examining predictive paths from sibling disengagement, enmeshment, warmth, conflict, and demographic variables to the initial levels of and changes in social problems (see Model 3 of Table 4). The model fit the data well, $\chi^2 = (21,$

$N$ = 282) = 32.99, $p$ = .05, $RMSEA$ = .04, $CFI$ = .99, $\chi^2/df$ ratio = 1.56. Enmeshment continued to predict subsequent increases in adolescent social problems even after taking into account the other predictors, $\beta$ = .24, $p$ < .05. Sibling conflict, warmth, and disengagement evidenced non-significant associations with the social problem variables.

Several demographic factors were associated with adolescent social problems. First, girls, on average, exhibited greater reductions in social problems than did boys. Second, adolescents with older siblings evidenced greater declines in social problems over the one year period than did adolescents with younger siblings. Third, adolescents with stronger biological ties to their siblings experienced fewer social problems. Fourth, siblings who lived together showed greater declines in social problems than did siblings who did not reside together. Finally, adolescents who were older than their siblings experienced more social difficulties than their counterparts who were the youngest of the sibling pair.

## Discussion

Although the expanding knowledge base on sibling relationships attests to the significance of siblings as socialization agents, scientists have issued urgent calls to expand the diversity of conceptual constructs and assessments of sibling relationships (McGuire et al., 2000; Noller, 2005). As a methodological complement to the predominant use of structured survey instruments, the current study specifically utilized a semi-structured maternal interview assessment of sibling relationship qualities. The rich narratives generated by this new assessment, in turn, permitted greater flexibility in assessing multiple sibling relationship parameters derived from different theories. Thus, toward the goal of increasing the conceptual diversity of measures, the key objective of this study was to advance the almost exclusive focus on obtaining assessments of sibling warmth (or support) and conflict by introducing a novel, complementary conceptual framework for assessing boundary disturbances reflecting sibling enmeshment and disengagement. Study results showed that two sibling boundary constructs of enmeshment and disengagement were each distinct predictors of adolescent adjustment difficulties. The findings collectively highlight the utility of understanding sibling relationships through a boundary conceptualization drawn from family systems theory that distinguishes between different sibling rules involving ways of exchanging information and resources.

In light of the novel interview approach to assessing sibling relationship processes, our first step in the analyses was to determine whether our measures of conventional indices of warmth and conflict were related to adolescent adjustment in similar ways to previous findings in the literature. Although the limited research linking warmth and conflict to children's psychological adjustment during adolescence yields complex and variable results, the findings from our models are largely consistent with the earlier studies. In accord with prior empirical demonstrations of sibling conflict as a significant predictor of a wide range of adjustment problems (Kim et al., 2007; Richmond et al., 2005), our analyses revealed that sibling conflict was associated with the multi-indicator, latent assessments of adolescent internalizing and externalizing problems and marginally related to social difficulties at Time 1. Conversely, while sibling warmth did not predict internalizing symptoms, it was a significant predictor of lower levels of concurrent and subsequent decreases in both externalizing and social difficulties. Collectively, these findings corroborate prior empirical documentation of sibling warmth as a more consistent predictor of lower externalizing and social problems (e.g., Branje et al., 2004; Kim et al., 2007) than internalizing symptoms (Widmer & Weiss, 2000). Thus, the considerable correspondence between our findings and the earlier empirical work bolsters confidence in the validity of the new sibling warmth and conflict assessments.

Operating from the base of support for the validity of the new interview measures of sibling warmth and conflict, our central objective was to determine whether the boundary conceptualizations offered any incremental leverage in understanding adolescent psychological problems. Although the moderate strength of the association between the two boundary disturbance variables ($r = .33$) suggests that enmeshment and disengagement are relatively distinct constructs, the shared overlap may reduce the power of each factor to predict adolescent adjustment patterns. Thus, our second step was to test whether sibling enmeshment and disengagement were unique predictors of concurrent levels of and prospective change in adolescent psychological difficulties when entered simultaneously as predictors in the analyses. Even after specifying the role of sibling enmeshment as predictors of adolescent adjustment, the results showed that higher levels of sibling disengagement continued to be uniquely associated with concurrent levels of adolescent social problems and subsequent increases in their externalizing problems over a one year period. As an assessment of emotional indifference and detachment characteristic of thick, inflexible boundaries for accessing relationship resources, our construct of sibling disengagement is roughly similar to research identifying a group of siblings characterized by hostile alienation (Hetherington, 1988). In keeping with our findings, Hetherington (1988) reported that children in these alienated sibling dyads were at elevated risk for exhibiting concurrent levels of externalizing problems and difficulties in the peer group.

In further support of the unique role of each sibling boundary characteristic, the results also revealed that subsequent increases in adolescent internalizing and social difficulties over a one year period were predicted by enmeshed or emotionally entangled sibling relationships after controlling for the effects of sibling disengagement. These results are consistent with prior work in studies on both sibling relationships and broader family processes. For example, earlier research has shown that indices of enmeshment in the broader family system have been consistently linked with children's vulnerability to internalizing symptoms (e.g., Jacobvitz et al., 2004; Sturge-Apple et al., 2010). Likewise, our findings correspond well with prior cross-sectional work by Hetherington (1998 indicating that children in enmeshed sibling relationships evidenced disproportionate vulnerability for internalizing symptoms and experiences of peer neglect.

In spite of this initial support for the sibling boundary approach, a central remaining question is: Why add greater complexity to the study of sibling relationships with another conceptualization? Although the increases in conceptual diversity and measurement versatility afforded by our approach help to allay this concern, we sought to address this question more definitively by testing whether sibling enmeshment and disengagement offered any additive power in predicting adolescent adjustment after considering the conventional indices of sibling warmth, conflict, and demographic characteristics. Supporting the incremental utility of the boundary disturbances assessments, inclusion of sibling warmth and conflict did not alter the significant pattern of findings from our earlier analytic steps. Whereas sibling enmeshment remained a significant predictor of subsequent increases in adolescent internalizing and social difficulties over a one year period, sibling disengagement continued to be associated with concurrent levels of adolescent social problems and subsequent increases in their externalizing problems over a one year period. Thus, boundary patterns provided valuable information beyond what we know from broad dimensions of warmth and conflict.

Our findings collectively beg the question of why discriminating between boundary patterns offers a complementary picture of adolescent development. One possible explanation lies in the fundamentally distinct way in which relational boundaries are defined. Prevailing approaches have defined sibling relationship characteristics (e.g., conflict, warmth) largely on the basis of the form or physical characteristics of a set of behaviors or processes.

Although structural characteristics are commonly well-defined in these models, relatively little attention has been devoted to elaborating on the function of behaviors within the context of sibling relationships. In drawing from family systems theory, our boundary conceptualization defines patterns of sibling behavior in terms of how it functions to define and maintain implicit rules of relating to each other and accessing resources. For example, in prevailing models of sibling relationships, conflict is defined based on the analysis of behaviors that reflect interpersonal antagonism. Yet, from a boundary conceptualization perspective, antagonistic sibling behaviors may reflect distinct patterns of relating. For some children, conflict may serve the function of increasing or maintaining interpersonal distance and reflect thick relationship boundaries characteristic of disengaged dyads. In other cases, the high level of antagonism may be manifestations of diffuse boundaries designed to further coax the child into an enmeshed relationship. Likewise, although it is plausible that sibling warmth may serve as a protective factor that attenuates the risk posed by sibling conflict for some children (e.g., McGuire et al., 1996; Sheehan et al., 2004), our boundary conceptualization suggests that some behaviors indicative of warmth (e.g., relatively exclusive affiliated relationships, protection) may also be part of a broader organization of behaviors that collectively function to emotionally ensnare children in the sibling relationship thereby inhibiting autonomy and, in the process, increase rather than decrease their vulnerability to psychological problems (Byng-Hall, 2002).

Developmental psychopathology conceptualizations may offer a further explanation for why boundaries offer distinct predictive power in understanding adolescent trajectories of adjustment (Cicchetti, 1991). During early adolescence, children must grapple with the formidable developmental challenge of balancing the establishment of autonomy with interpersonal intimacy in close relationships (Furman & Wehner, 1994; McElhaney et al., 2009). In the context of a stage-salient task framework, the emotional detachment in disengaged sibling relationships may be part of a developmental process whereby children are increasingly valuing autonomy at the expense of interpersonal rapport. As a result, any progress toward achieving independence takes on a form of interpersonal alienation, callousness, and unmitigated agency that are theorized to serve as breeding grounds for social difficulties and externalizing problems (Forman & Davies, 2005; Sturge-Apple et al., 2010). Conversely, enmeshed sibling relationships can be interpreted from a developmental perspective as reflecting the sacrifice of autonomy in the pursuit of interpersonal closeness. In the long run, high emotional stakes within the enmeshed relationships are proposed to limit opportunities to develop broader social networks and interpersonal skills and engender an autocentric pattern, introspective rumination, excessive worry, and perceived inadequacy (Forman & Davies, 2005; Gjerde, 1995). In keeping with this explanation, sibling enmeshment was a specific predictor of increases in adolescent social difficulties and internalizing symptoms over the longitudinal course of the study, while sibling disengagement was specifically related to their concurrent social problems and increases in externalizing symptoms over time. Thus, identification of developmental processes that mediate the sequelae of boundary disturbances may be a fruitful direction for future research.

In evaluating the prospects of the new way of conceptualizing and assessing sibling relationship dynamics, it is also important to consider the potential merits in further refining our approach. Identification of a moderate, positive correlation between disengagement and enmeshment may be cause for further sharpening in the operational definitions of the boundary disturbance constructs. A primary source of overlap between the variables may be rooted in evaluating the function of hostility in the sibling relationship. Hostility and controlling behaviors can serve multiple, complex functions, including increasing interpersonal distance, promoting emotional entanglement, or potentially both. Consistent with this hypothesis, Jacobvitz and colleagues (2004) reported that controlling and hostile

behaviors evidenced moderate to high correlations with ratings of disengagement and enmeshment in triadic interactions involving mothers, fathers, and toddlers. Thus, altering interviewing or coding procedures may be useful in further distinguishing the multiple relational meanings of hostility in the sibling dyad which may reduce empirical overlap in the boundary variables. Likewise, although the parsimony in our approach of differentiating between two common boundary disturbances confers advantages, it is possible that the overlap may reflect another, unidentified relationship pattern marked by high ambivalence and fluctuations between enmeshment and disengagement (Constantine, 1983).

However, as a cautionary note, it may be premature to proceed with modifications without further exploring the utility of the new system for assessing sibling relationships. In spite of the moderate correlation, enmeshment and disengagement share less than eleven percent of variance with each other. Moreover, as we highlighted in the description and interpretation of findings, the two forms of boundary disturbance also offer unique predictive leverage in accounting for adolescent adjustment problems. Thus, the findings support the systems conceptualization that enmeshment and disengagement are distinct in their substance and developmental implications.

Interpretation of the findings must also be balanced with a consideration of the limitations of the study. First, it is important to note that pathways among sibling relationship boundary dimensions and adolescent adjustment tended to be modest in magnitude. Although even modest associations among sibling processes may be regarded as substantively powerful and meaningful, the findings suggest that improvement in prediction might be achieved by developing measurement approaches that complement the rich maternal narratives derived from the interview. For example, developing a parallel interview with adolescents or an observational system for assessing sibling interactions may further advance an understanding of sibling relations. At another level, the heterogeneity in outcomes also raises the interesting possibility that sibling enmeshment and disengagement may confer advantages for children under some developmental conditions. For example, it is possible that enmeshed relationships may afford protection from highly adverse family conditions.

Second, although our strategy of testing the incremental utility of relational boundary patterns within latent change models provides a conservative test of our hypotheses, it does not rule out other potential pathways. Due to extra complexity in parameter estimation and its negative implications for obtaining stable model solutions in predicting any single form of psychological adjustment, it was not possible to simultaneously incorporate initial levels of and changes in multiple forms of adjustment (e.g., internalizing and externalizing symptoms) as covariates in the analyses. Likewise, our longitudinal design did not afford a bidirectional analysis in which adolescent adjustment difficulties may further set the stage for changes in sibling boundary disturbances. In fact, the concurrent associations between the boundary patterns and adolescent adjustment may reflect the operation of child effects on sibling relationship dynamics. For example, in highlighting the transactional interplay between individuals and relationships in family systems theory (Cox & Paley, 1997; Davies & Cicchetti, 2004), it is plausible that the concurrent relationship between sibling disengagement and social problems is a product of an evocative process whereby the social impairments of adolescents engender greater sibling disengagement.

Third, our distinction between sibling enmeshment and disengagement should not be interpreted as an exhaustive representation of boundary disturbances. For example, cohesive relationships are another important relationship parameter in interpersonal boundary models (e.g., Kerig, 1995). However, given the substantial conceptual overlap between cohesion and warmth, we specifically adopted a parsimonious approach of selectively focusing on the two boundary patterns that were the theoretically most distinct from the warmth and conflict

conceptualizations in the sibling literature. Armed with evidence to support the incremental value of our boundary concepts, a next important step for research is to determine whether more complex, multi-dimensional conceptualizations of sibling boundaries add any precision to our model. For example, the developmental implications of enmeshed and disengaged sibling relationships may vary as a function of the specific roles children assume in the sibling relationship (e.g., being over protective vs. being over protected or being the victim vs. the victimizer). Finally, caution should be exercised in generalizing the findings beyond our predominantly working and middle class sample, as the developmental repercussions of sibling boundary patterns may be different in other populations. For example, because children in our sample were largely from intact families with biologically related siblings, replicating these results in families with other structural characteristics is an important direction in future research.

In conclusion, the results break new ground in understanding the role of sibling relationship processes in adolescents' adjustment by conceptualizing sibling dynamics in terms of the analysis of boundary differences in the regulation of relationship resources. The findings of our multi-method, multi-informant longitudinal study demonstrate the uniqueness of sibling relationship boundary patterns in accounting for individual differences in adolescent adjustment difficulties above and beyond conventional sibling relationship dimensions and structural characteristics. In representing a first step in adopting a novel lens for understanding sibling interpersonal processes, the study may, in conjunction with future empirical efforts, have implications for intervention efforts in improving the welfare of children and families by providing a more comprehensive understanding of sibling relationship dynamics that may need to be the target in intervention programs.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments

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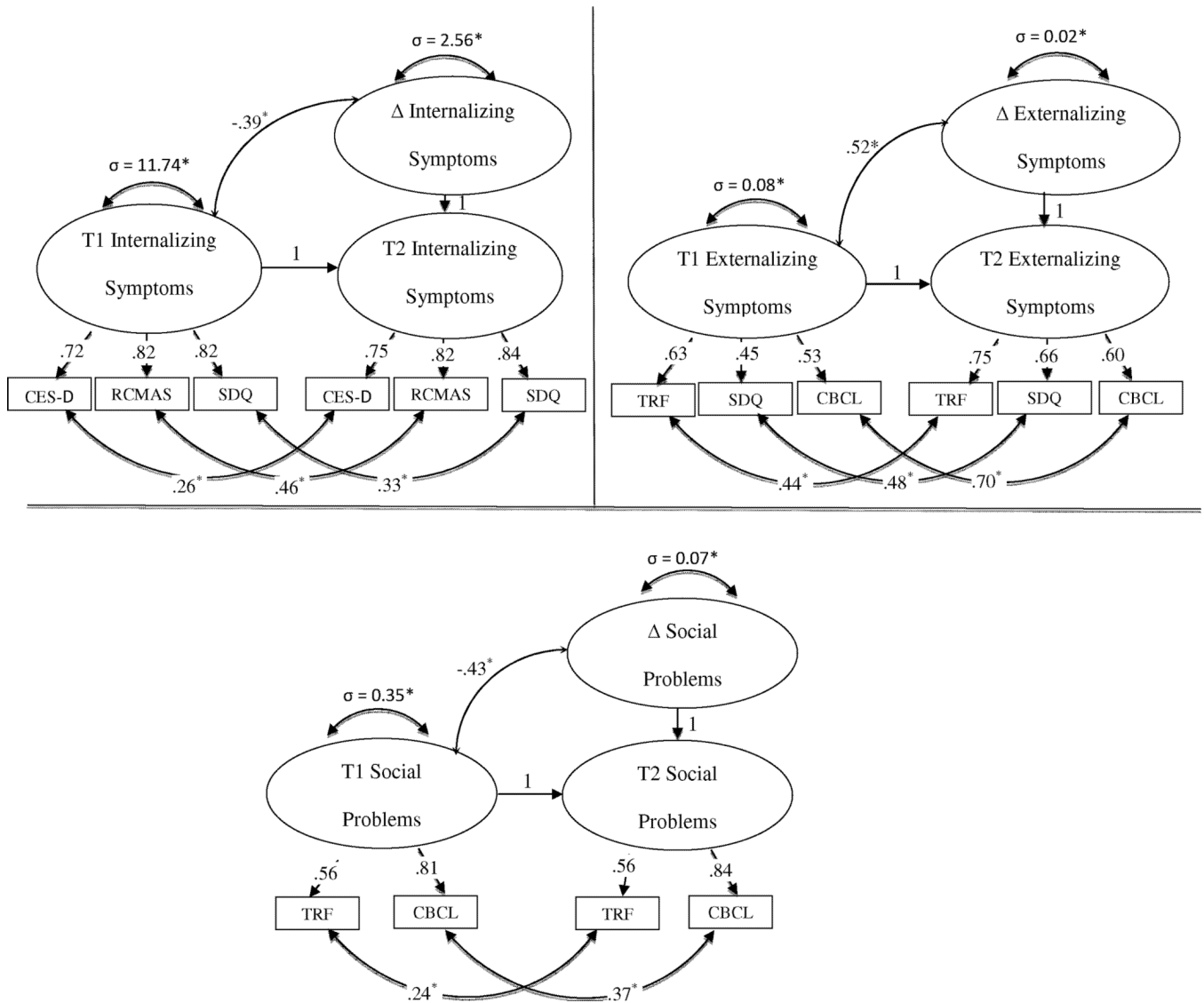
**Figure 1.**

Figure 1a. An unconditional latent difference score analysis of adolescent internalizing symptoms at Times 1 and 2. * $p < .05$.

Figure 1b. An unconditional latent difference score analysis of adolescent externalizing symptoms at Times 1 and 2. * $p < .05$.

Figure 1c. An unconditional latent difference score analysis of adolescent social problems at Times 1 and 2. * $p < .05$.

**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 | 21 | 22 | 23 | 24 | 25 | 26 | M | SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Time 1** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Adolescent sex | - | | | | | | | | | | | | | | | | | | | | | | | | | | 0.51 | 0.50 |
| 2. Adolescent age | -.02 | - | | | | | | | | | | | | | | | | | | | | | | | | | 12.67 | 0.59 |
| 3. Sibling sex | .02 | -.08 | - | | | | | | | | | | | | | | | | | | | | | | | | 0.52 | 0.50 |
| 4. Sibling age | .08 | .06 | .04 | - | | | | | | | | | | | | | | | | | | | | | | | 12.76 | 3.81 |
| 5. DEV status: older | -.05 | .03 | .01 | -.74* | - | | | | | | | | | | | | | | | | | | | | | | 0.53 | 0.50 |
| 6. Genetic REL | .07 | .02 | .08 | .02 | -.04 | - | | | | | | | | | | | | | | | | | | | | | 2.82 | 0.51 |
| 7. Co-residency status | -.03 | .12* | -.12* | -.37* | .16* | .23* | - | | | | | | | | | | | | | | | | | | | | 0.91 | 0.28 |
| 8. Warmth | .01 | .03 | -.03 | -.05 | .05 | -.03 | .01 | - | | | | | | | | | | | | | | | | | | | 1.62 | 0.76 |
| 9. Conflict | -.04 | .03 | -.21* | -.22* | .16* | .05 | -.27* | -.22* | - | | | | | | | | | | | | | | | | | | 1.32 | 0.59 |
| 10. Disengaged | .04 | .00 | .01 | .02 | -.03 | -.04 | .06 | -.70* | .42* | - | | | | | | | | | | | | | | | | | 0.19 | 0.20 |
| 11. Enmeshed | .02 | .16* | .13* | .04 | -.09 | .00 | .01 | -.15* | .25* | .33* | - | | | | | | | | | | | | | | | | 0.14 | 0.17 |
| 12. CES-D | .11 | .03 | .00 | -.03 | .03 | -.06 | -.07 | .02 | .08 | .00 | .14* | - | | | | | | | | | | | | | | | 24.02 | 6.99 |
| 13. RCMAS | .14* | .07 | -.02 | -.03 | .04 | -.08 | -.06 | .11 | .07 | .04 | .02 | .58* | - | | | | | | | | | | | | | | 6.88 | 4.76 |
| 14. SDQ | .27* | .05 | -.00 | -.00 | .02 | -.11 | -.06 | .04 | .09 | .01 | .04 | .59* | .67* | - | | | | | | | | | | | | | 2.24 | 2.23 |
| 15. TCH SOC PRB | -.03 | .06 | .08 | .11 | -.06 | -.09 | .00 | -.08 | .12* | .13* | .15* | .25* | .15* | .25* | - | | | | | | | | | | | | 1.06 | 2.02 |
| 16. Mom SOC PRB | -.05 | .03 | -.04 | -.07 | .14* | .24* | .06 | -.11 | .12* | .17* | .05 | .25* | .24* | .31* | .44* | - | | | | | | | | | | | 1.85 | 2.37 |
| 17. TCH DEL | -.12 | -.00 | .03 | .08 | -.06 | -.06 | -.06 | -.03 | .05 | .00 | .06 | .17* | .03 | .18* | .52* | .16* | - | | | | | | | | | | 0.90 | 1.76 |
| 18. CH CND PRB | -.12 | -.01 | -.13* | -.03 | .07 | -.16* | .00 | -.09 | .18* | .08 | .08 | .41* | .28* | .43* | .22* | .24* | .30* | - | | | | | | | | | 1.85 | 1.79 |
| 19. Mom DEL | -.14* | -.02 | -.09 | -.05 | .13* | -.14* | .00 | -.16* | .20* | .15* | .03 | .21* | .07 | .25* | .25* | .52* | .34* | .39* | - | | | | | | | | 1.34 | 1.86 |
| **Time 2** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20. CES-D | .08 | -.06 | -.03 | .05 | -.02 | -.09 | -.12* | .09 | .04 | .05 | .17* | .54* | .52* | .45* | .04 | .14* | .16* | .35* | .20* | - | | | | | | | 24.15 | 6.43 |
| 21. RCMAS | .15* | .10 | -.01 | -.04 | .06 | -.05 | -.09 | .05 | .06 | .04 | .15* | .44* | .70* | .59* | .08 | .17* | -.06 | .25* | .10 | .62* | - | | | | | | 6.50 | 4.50 |
| 22. SDQ | .30* | .03 | -.06 | .06 | .02 | -.11 | -.21* | .05 | .00 | .02 | .12* | .48* | .53* | .65* | .07 | .12* | -.00 | .32* | .12* | .63* | .69* | - | | | | | 2.17 | 2.03 |
| 23. TCH SOC PRB | -.10 | -.09 | -.03 | -.04 | .00 | -.12* | -.08 | -.11 | .17* | .18* | .16* | .36* | .18* | .25* | .45* | .46* | .36* | .39* | .33* | .19* | .07 | .12* | - | | | | 0.96 | 1.89 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | M | SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24. Mom SOC PRB | -.14* | -.01 | -.06 | -.12* | .15* | -.23* | -.00 | -.18* | .13* | .21* | .14* | .21* | .15* | .19* | .38* | .73* | .19* | .28* | .55* | .05 | .11 | .07 | .50* | - | | | 1.44 | 2.01 |
| 25. TCH DEL | -.08 | -.05 | -.11 | .05 | -.03 | -.10 | -.11 | -.11 | .14* | .13* | .05 | .23* | .02 | .18* | .36* | .15* | .66* | .41* | .35* | .17* | -.04 | .12* | .60* | .23* | - | | 1.15 | 2.15 |
| 26. CH CND PRB | -.16* | .11 | -.11 | -.12* | .14* | -.13* | -.10 | -.08 | .07 | .04 | .17* | .40* | .23* | .30* | .16* | .08 | .35* | .62* | .28* | .42* | .24* | .39* | .35* | .12* | .50* | - | 1.87 | 1.66 |
| 27. Mom DEL | -.17* | .00 | -.04 | -.08 | .12 | -.07 | .02 | -.29* | .24* | .26* | .13* | .20* | .06 | .17* | .22* | .33* | .37* | .37* | .78* | .13* | .05 | .05 | .43* | .57* | .45* | .30* | 1.46 | 2.37 |

*Note.* DEV = developmental, REL = relation, CES-D = center for epidemiological studies depression scale, RCMAS = revised child manifest anxiety scale, SDQ = self-report strengths and difficulties questionnaire, TCH = teacher, SOC PRB = social problems, DEL = delinquency, CH CND PRB = child conduct problems.

*
$p < .05$.

**Table 2**

Standardized Path Coefficients of Sibling Relationship Characteristics and Covariates in the Prediction of Concurrent Levels of and Changes in Adolescent Internalizing Symptoms From T1 to T2

| | Model 1a | | Model 1b | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|---|---|
| | T1 | Δ | T1 | Δ | T1 | Δ | T1 | Δ |
| Predictors: Covariates | | | | | | | | |
| 1. Sex of target adolescent | .26* | .10 | .25* | .10 | .25* | .09 | .25* | .09 |
| 2. Age of target adolescent | .07 | .00 | .07 | .00 | .06 | −.04 | .06 | −.04 |
| 3. Sex of sibling | .01 | −.08 | −.01 | −.08 | −.02 | −.11 | .01 | −.13† |
| 4. Age of sibling | −.02 | .03 | −.04 | .04 | −.03 | .05 | −.01 | .05 |
| 5. Developmental status: older | .02 | .07 | .02 | .07 | .03 | .10 | .03 | .11 |
| 6. Genetic relation | −.11† | .01 | −.11† | .01 | −.11† | .02 | −.11† | .02 |
| 7. Co-residency status | −.12 | −.18* | −.08 | −.19* | −.08 | −.19* | −.12 | −.16* |
| 8. T1 internalizing symptoms | −.43* | - | - | −.43* | - | −.43* | - | −.42* |
| Primary Predictors | | | | | | | | |
| 1. Warmth | - | - | −.07 | −.01 | - | - | −.12† | −.04 |
| 2. Conflict | .13* | .03 | - | - | - | - | .15* | .11 |
| 3. Enmeshment | - | - | - | - | .07 | .22* | .04 | .26* |
| 4. Disengagement | - | - | - | - | .04 | .02 | - | - |

Note.

*
*p* .05. T1 = time 1; Δ = change from Time 1 to 2.

**Table 3**

Standardized Path Coefficients of Sibling Relationship Characteristics and Covariates in the Prediction of Concurrent Levels of and Changes in Adolescent Externalizing Symptoms From T1 to T2

| | Model 1a | | Model 1b | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|---|---|
| | T1 | Δ | T1 | Δ | T1 | Δ | T1 | Δ |
| Predictors: Covariates | | | | | | | | |
| 1. Sex of target adolescent | -.17* | -.04 | -.17* | -.05 | -.18* | -.07 | -.16* | -.06 |
| 2. Age of target adolescent | -.06 | .14 | -.04 | .16 | -.06 | .13 | -.05 | .15 |
| 3. Sex of sibling | -.10 | -.05 | -.14† | -.06 | -.15* | -.08 | -.10 | -.08 |
| 4. Age of sibling | .21† | -.46* | .16 | -.50* | .17 | -.48* | .20† | -.51* |
| 5. Developmental status: older | .18† | -.26† | .19† | -.26 | .21† | -.24 | .18† | -.25 |
| 6. Genetic relation | -.21* | -.22* | -.21* | -.22† | -.20* | -.25* | -.23* | -.25* |
| 7. Co-residency status | -.03 | -.37* | .02 | -.36* | .01 | -.39* | -.03 | -.37* |
| 8. T1 externalizing symptoms | - | .41* | - | .33* | - | .34* | - | .37* |
| Primary Predictors | | | | | | | | |
| 1. Warmth | - | - | -.17* | -.24* | - | - | -.21* | -.01 |
| 2. Conflict | .23* | .05 | - | - | - | - | .24* | .09 |
| 3. Enmeshment | - | - | - | - | .10 | .11 | - | - |
| 4. Disengagement | - | - | - | - | .09 | .27* | .12 | .34* |

Note.

*
*p* .05. T1 = time 1; Δ = change from Time 1 to 2.

**Table 4**

Standardized Path Coefficients of Sibling Relationship Characteristics and Covariates in the Prediction of Concurrent Levels of and Changes in Adolescent Social Problems From T1 to T2

| | Model 1a | | Model 1b | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|---|---|
| | T1 | Δ | T1 | Δ | T1 | Δ | T1 | Δ |
| Predictors: Covariates | | | | | | | | |
| 1. Sex of target adolescent | −.04 | −.23* | −.02 | −.21* | −.04 | −.23* | −.04 | −.22* |
| 2. Age of target adolescent | .02 | −.13 | .02 | −.09 | .01 | −.16† | .02 | −.15 |
| 3. Sex of sibling | .04 | −.13 | −.00 | −.13 | .00 | −.17* | .01 | −.18* |
| 4. Age of sibling | .19† | −.40* | .14 | −.37* | .16 | −.36* | .17 | −.37* |
| 5. Developmental status: older | .22* | −.19 | .22* | −.15 | .23* | −.13 | .22* | −.13 |
| 6. Genetic relation | −.30* | .08 | −.27* | .05 | −.28* | .07 | −.28* | .06 |
| 7. Co-residency status | .12 | −.34* | .14* | −.27* | .14† | −.30* | .13† | −.29* |
| 8. T1 social problems | - | −.58* | - | −.62* | - | −.64* | - | −.64* |
| Primary Predictors | | | | | | | | |
| 1. Warmth | - | - | −.15* | −.20* | - | - | −.08 | −.18 |
| 2. Conflict | .12† | .09 | - | - | - | - | .03 | .03 |
| 3. Enmeshment | - | - | - | - | .03 | .23* | .03 | .24* |
| 4. Disengagement | - | - | - | - | .17* | .11 | .09 | .01 |

Note.

*
*p* .05. T1 = time 1; Δ = change from Time 1 to 2.