Published in final edited form as:

J Fam Psychol. 2011 October ; 25(5): 719–730. doi:10.1037/a0025288.

Positive Engagement Behaviors in Observed Family Interactions: A Social Relations Perspective

Robert A. Ackerman, Deborah A. Kashy, and M. Brent Donnellan
Michigan State University

Rand D. Conger
University of California, Davis

Abstract

The present study investigates the nature of positive engagement (an interpersonal style characterized by attentiveness, warmth, cooperation, and clear communication) in family interactions involving at least one adolescent. Approximately 400 families (mothers, fathers, and two siblings) were videotaped during brief conflict resolution discussions that occurred on a yearly basis for three years. Coders rated the degree to which each family member was positively engaged with every other family member during the interactions. The Social Relations Model was used to partition variation in positive engagement behavior into family-level, individual-level, and dyad-level effects. Results demonstrated the importance of family norms and individual factors in determining the expression of positive engagement behaviors in dyadic family relationships. Moreover, longitudinal analyses indicated that these effects are stable over a three year period. Finally, results highlighted the relative distinctiveness of the marital and sibling relationships, as well as the existence of reciprocity within these dyads.

Keywords

Social Relations Model; Family Systems; Positive Behavior; Longitudinal Analyses; Behavioral Stability

Positive interpersonal interactions characterized by effective communication, supportiveness, and warmth have received increasing attention in research on psychological aspects of the family climate. For example, Eisenberg and her colleagues (e.g., Eisenberg, Zhou, Spinrad, Valiente, Fabes, & Liew, 2005) have emphasized that warm, pleasant, and responsive parenting practices are conducive to effective child socialization. Likewise, McCoy, Cummings, and Davies (2009) discussed the importance of the constructive resolution of marital conflict for children's positive social adjustment. Given that the family is one of the major contexts of human development (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000), it is important to gain a more precise understanding of the sources of these positive interactions (Rasbash, Jenkins, O'Connor, Tackett, & Reiss, 2011). That is, are positive interpersonal behaviors attributable to family norms, specific

Corresponding Author: Robert A. Ackerman, Department of Psychology, Michigan State University, 244C Psychology Building, East Lansing, MI 48824-1116; ackerm64@msu.edu. Phone number: (517) 353-0898. Fax number: (517) 353-1652..

Publisher's Disclaimer: The following manuscript is the final accepted manuscript. It has not been subjected to the final copyediting, fact-checking, and proofreading required for formal publication. It is not the definitive, publisher-authenticated version. The American Psychological Association and its Council of Editors disclaim any responsibility or liabilities for errors or omissions of this manuscript version, any version derived from this manuscript by NIH, or other third parties. The published version is available at www.apa.org/pubs/journals/fam

relationships within the family, or characteristics of the individual family members themselves? Moreover, how stable are these sources of behavior over time?

Drawing on insights from family systems theory (Cox & Paley, 1997), this paper approaches these questions by applying the Social Relations Model (SRM; Kenny, Kashy, & Cook, 2006) to longitudinal observations of positive engagement in family interactions. Positive engagement refers to an interpersonal style characterized by attentiveness, warmth, cooperation, and clear communication; as such, it captures many of the qualities associated with positive interpersonal behavior. Approximately 400 families (mothers, fathers, and two siblings) were videotaped during brief conflict resolution discussions that occurred on a yearly basis for three years. We use the SRM to evaluate the degree to which expressions of positive engagement within dyadic family relationships is a function of family-, dyad-, and individual-level processes. In addition, we examine the stability of these components over a three-year period.

Positive Interpersonal Behavior in Families

Positive interpersonal behaviors play a potentially important role in all family relationships. For instance, Davidov and Grusec (2006) argue that positive parenting is comprised of two distinct features: responsiveness to distress and warmth. Whereas responsiveness to distress entails attending to and validating children's negative affect and helping them to solve problems, parental warmth entails provisions of affection and expressions of positive affect. Similar ideas regarding positive and supportive interpersonal behavior appear in discussions of marital (see McCoy et al., 2009) and sibling relationships (e.g., Kramer, 2010). In these contexts, positive behaviors generally involve expressions of positive affect (e.g., interest and affection) and behaviors relevant for constructive conflict resolution.

Much of this past work has focused on positive behaviors that occur in specific dyadic combinations within the family (e.g., the father-child dyad). Implicit in this approach is the notion that the observed behavior in a specific dyad reflects something that is unique about that specific relationship. However, a father's observed positive behavior with his child may be high because the father always behaves positively, regardless of his interaction partner. Alternatively, the observed positive behavior may be high because everyone in that particular family behaves positively. Therefore, a correlation between children's outcomes and behavior observed in the father-child dyad might mistakenly be attributed to qualities of the unique father-child relationship when these outcomes may really reflect the benefits of being raised by certain kinds of individuals or in certain kinds of families. Indeed, researchers interested in the family climate have found that families characterized by greater levels of warmth and support have children that exhibit better emotional development (Halberstadt & Eaton, 2002) and self-regulation (Eisenberg et al., 2005). In short, a more precise understanding of the origins of positive behaviors in the family has important theoretical consequences.

Conceptual and Methodological Issues in Modeling Positive Family Dynamics

A cornerstone of contemporary theorizing about the family is that family interaction patterns are multiply determined (e.g., Collins et al., 2000), transactional (see e.g., Collins et al., 2000), and embedded in broader systems (Collins et al., 2000; Cox & Paley, 1997). Researchers must therefore match the theoretical sophistication of contemporary perspectives on family dynamics with appropriate methodological and statistical approaches. Given the mutual interdependence of subsystems within the family unit, it is important to collect information from all members of the family. This approach, as opposed to reliance

on single informant report methods, is more likely to capture the rich and potentially contextualized nature of family dynamics. Likewise, the statistical techniques family researchers use to model their data need to incorporate the interdependence of family subsystems. The Social Relations Model for families provides a methodological and statistical approach that can model these complexities (e.g., Eichelsheim, Dekovic, Buist, & Cook, 2009).

As specified in the SRM, a dyadic score (e.g., how warm and supportive Andrew is when interacting with his older sister Kate) can reflect four factors: a family mean effect, an actor effect, a partner effect, and a relationship effect. The *family mean* is the average level of response across all family members, and it can be interpreted as an indication of a family norm for a particular behavior (e.g., Andrew's warmth with Kate may occur because Andrew and Kate come from a particularly warm and supportive family). The actor and partner effects are individual-level effects that may reflect stable dispositional tendencies. The *actor effect* represents the consistency of a person's behavior across partners (e.g., Andrew may be warm and supportive to everyone in the family). Moreover, the *partner effect* represents the degree to which a person elicits similar behavior from others (e.g., Andrew's warmth toward Kate may be a result of stable characteristics of his sister: Kate may elicit warmth from everyone in the family). The *relationship effect* is the unique component of behavior within the dyad that remains after removing the family mean and the actor and partner effects (e.g., Andrew may be especially supportive of Kate, more than he is to other family members, and more than other family members tend to be with Kate).

An SRM analysis decomposes variation in dyadic scores within each family into the four types of effects described above. It then estimates the variance in these effects across families. The relative sizes of these variances speak to the underlying dynamics of positive behavior. For example, a large variance for the family mean would indicate that families tend to differ in their average levels of positive behavior, thus reflecting the possibility that some families develop norms that foster a warm atmosphere whereas others have well-established patterns of interpersonal disengagement. In contrast, if positive behavior is driven by actor and partner effects (i.e., the variances associated with these elements are large relative to other components), then this would suggest that this behavior is principally a function of individual differences rather than family norms or specific relationship dynamics. On the other hand, if the degree of positive behavior varies primarily at the relationship level, the implication is that elements unique to particular dyadic relationships drive interpersonal engagement in family interactions.

The SRM also estimates correlations between the different effects. *Generalized reciprocity* is indexed by the correlation between a family member's actor effect and her or his partner effect. Thus, generalized reciprocity assesses whether a family member who is warm to everyone also tends to be the recipient of warmth from everyone. *Dyadic reciprocity* is indexed by the correlation between the two directed relationship effects for a particular combination of roles. Dyadic reciprocity therefore measures whether unique behavior between dyad members is reciprocated (e.g., if the mother is especially warm to the older child, is that child especially warm with the mother). *Intragenerational similarity* is indexed by correlations between the two parents' actor effects and between the two children's actor effects. These correlations model similarity in positive behavior within generations and help to capture the concept of alliances discussed in the family systems literature (e.g., Gable, Crnic, & Belsky, 1995).

With over-time data, the SRM can be used to examine stability and change in intra-family behavior. Only a few studies have extended the SRM with families to longitudinal data. Buist, Reitz, and Dekovic (2008) studied self-reported attachment security using two waves

of round-robin data from families with adolescent children. Likewise, van Aken, Oud, Mathijssen, and Koot (1998) studied perceptions of restrictiveness in two waves that spanned a six-month period. Finally, Branje, van Lieshout, and van Aken (2005) investigated family members' reports of dyadic commitment at two time points across a one-year interval. These studies provide evidence of stability in family members' actor effects, marital relationship effects, and the family mean. An important aim of this study will be to evaluate whether the same findings generalize to observed expressions of positive interpersonal behavior in families across three time-points.

The Current Study

In this study we investigate the extent to which the positive behavior exhibited by one family member toward another reflects qualities of an overall family climate, the individual attributes of the members involved, or the unique dyadic relationship between the two members. We also investigate whether the expression of positive behavior is a function of stable trait-like attributes versus more transient state-like processes.

Research using the SRM with families has consistently found large actor variances (e.g., Eichelsheim et al., 2009; Rasbash, et al., 2011). We therefore predict that positive engagement will have a strong dispositional (i.e., actor) component. Findings regarding the family mean, however, have been mixed, with many studies finding little evidence of family mean variance (see Eichelsheim et al., 2009). Nevertheless, research investigating variables akin to positive engagement, such as self-disclosure and affection, has shown significant variance in the family mean (e.g., Delsing, Oud, De Bruyn, & van Aken, 2003; Finkenauer, Engels, Branje, & Meeus, 2004). This suggests that family-wide norms may play an important role in shaping how positively engaged family members are with one another, and so we expect to see variance in the family mean in this study. Finally, research has generally found more relationship variance in horizontal relationships (i.e., husband-wife and sibling-sibling) than in vertical relationships (i.e., parent-child; Eichelsheim, et al., 2009), and we expect to find a similar pattern.

Because we have observations of the same families across a three-year period, we can examine stability in the enactment of positive engagement over time. There is substantial evidence that individual attributes are relatively stable (Roberts & DelVecchio, 2000). We therefore expect that actor effects for positive engagement will likewise be stable. Further, adaptive self-stabilization processes (Cox & Paley, 1997) are theorized to promote stability in the family system, and so we expect stability in the family mean.

Method

Participants

The sample for this study consisted of families that were recruited as part of the Iowa Youth and Families Project (see Conger, Cui, Bryant, & Elder, 2000). All families were Caucasian and consisted of two parents (i.e., a mother and a father) and at least two children. In the initial wave of data collection in 1989, one of the children was required to be in seventh grade (i.e., the target child) and the other sibling had to be within four years of age. The data for this paper were taken from three waves of the project; Wave 1 (1989) consisted of 445 families, wave 2 (1990) consisted of 413 families, and wave 3 (1991) consisted of 424 families.

The current paper distinguishes the children according to age (two pairs of twins were omitted). Thus, across the sample, the mean age at wave 1 of the older child was 13.93 years ($SD = 1.47$) and the mean age of the younger child was 11.54 years ($SD = 1.27$). In 29% of

the families both children were girls, and in 24% both children were boys. Fathers' ages ranged from 31 to 68 years ($M = 39.74$, $SD = 4.92$), and mothers' ages ranged from 29 to 53 years ($M = 37.69$, $SD = 4.13$). The majority of the parents graduated high school or obtained their GED (fathers: 42.8%; mothers: 42.6%), or possessed a B.S. or B.A. (fathers: 16.4%; mothers: 16.0%).

Procedure

Families with 7th graders were recruited via the school system in Iowa. Trained interviewers met with each of the families in their homes twice a year for the three years of the study reported here. At the first meeting, an interviewer provided each family member with various questionnaires concerning his or her personality, family interactions, and economic issues. About two weeks later, the interviewer returned and videotaped the families engaging in a conflict discussion task. Before beginning the videotaped interaction, each family member completed a questionnaire that asked her or him to identify issues that often led to conflict with other family members. The interviewer then selected three issues that seemed to engender the most conflict. Some example issues included chores at home and respect. The family members were seated around a table, presented with the cards, and instructed to choose the issue that aroused the most conflict. They were told to try to resolve it through discussion. The videotaped conflict discussion task lasted approximately 15 minutes, and families were instructed to try to resolve the other conflicts if they were able to resolve the first topic within those 15 minutes.

The videotaped task was coded by trained observers using the Iowa Family Interaction Rating Scales (Melby & Conger, 2001). The positive engagement variable was a composite of five scales from this rating system: *Communication* (e.g., conveying ideas in an effective and appropriate manner), *Listener Responsiveness* (e.g., being attentive and expressing interest in what the other person is saying), *Warmth/Support* (e.g., expressing concern or appreciation), *Prosocial Behavior* (e.g., being cooperative and helpful), and *Assertiveness* (e.g., being forthright about opinions with others). Coders rated these dimensions for all dyadic pairs. For example, they rated mother's communication toward the father, the mother's communication toward the target child, and the mother's communication toward the sibling. Separate codes for the father's communication toward the mother and each child were also obtained, as were codes for each child, and so each rated dimension resulted in 12 scores for each family. Coders were instructed to take a macrolevel perspective, and so instead of recording the frequencies of behaviors, coders were trained to evaluate overall patterns of behavior and assigned ratings on a 5-point scale that ranged from 1 (*Not at all characteristic*) to 5 (*Mainly characteristic*).

Reliability between observers was assessed by randomly assigning an independent observer to code about 20% of the videotaped interactions (Melby & Conger, 2001). Intraclass correlation coefficients (ICCs) based on a one-way random effects ANOVA model were used to assess interrater reliability for each dimension at each wave. Single-item ICCs were used because individual observers' ratings, and not the mean of both observers' ratings, were used in further analyses (see Choukalas, Melby, & Lorenz, 2000). Across the 12 dyads and the three waves, the average interrater ICC for each rated dimension was as follows: Communication ($M = .43$, $SD = .07$), Listener Responsiveness ($M = .38$, $SD = .06$), Warmth/Support ($M = .39$, $SD = .08$), Prosocial Behavior ($M = .38$, $SD = .08$), and Assertiveness ($M = .33$, $SD = .09$). These relatively low ICC values indicate that some error was present in the behavioral ratings of these items.

Exploratory factor analyses were conducted on the five dimensions at each of the three waves for each of the 12 dyad types, and the ratios of the first to second eigenvalues obtained from the analyses consistently suggested that the measures formed a

unidimensional construct. Therefore scores on the five indicators were averaged to produce a composite score of observed positive engagement behavior. In sum, we had 12 data points for each family: father's positive engagement with mother (FM), father's positive engagement with the older child (FO), father's positive engagement with the younger child (FY), mother's positive engagement with father (MF), and so on (i.e., MO, MY, OF, OM, OY, YF, YM, YO). The average internal consistency coefficients (i.e., Cronbach's alpha) for positive engagement across the 12 dyads in 1989, 1990, and 1991, were .81 ($SD = .02$), .81 ($SD = .03$), and .76 ($SD = .03$), respectively. Moreover the mean average inter-item correlation coefficients for positive engagement across the 12 dyads in 1989, 1990, and 1991, were .47 ($SD = .03$; range = .44 to .53), .47 ($SD = .05$; range = .40 to .54), and .38 ($SD = .06$; range = .32 to .48), respectively.

Results

In the traditional latent-variable approach to estimating the SRM for families, each dyadic score is treated as an indicator of three latent factors – the family mean effect, an actor factor, and a partner factor (Kenny et al., 2006). For example, the degree to which the older child is positively engaged with the mother is treated as an indicator of the latent family mean effect (how much engagement occurs in the family in general), the older-child actor latent factor (how engaged the older child is in general), and the mother partner latent factor (how engaged family members generally tend to be with the mother). Similarly, the older child-father measure is treated as an indicator of the family mean effect, the older-child actor factor, and the father partner factor. The relationship effect is typically specified as the variation in the dyadic score that is not explained by the latent factors, and so it is contaminated with error variance.

SRM Analyses Separately by Year

Our first analyses specified the standard SRM with family roles for each year separately. Figure 1 uses two panels to illustrate the basic family SRM that we used for a single wave of data. Panel A depicts the family mean latent variable, the twelve relationship-plus-error residuals, and the six dyadic reciprocity covariances. Panel B depicts the four actor and four partner latent variables, as well as the four generalized reciprocity covariances. The traditional SRM for families typically fixes the factor loadings for all latent variables to 1.0, thus providing estimates of variance for the SRM components. (As we discuss later, Panel B deviates somewhat from the traditional SRM specification because four factor loadings are estimated and the model includes the intragenerational actor-actor correlations for parents and siblings.) This standard specification resulted in a poorly fitting model for each of the three waves: For 1989, $\chi^2(47) = 370.60$, $p < .001$, CFI = .931, RMSEA = .124; for 1990, $\chi^2(47) = 364.13$, $p < .001$, CFI = .931, RMSEA = .122; and for 1991, $\chi^2(47) = 279.29$, $p < .001$, CFI = .947, RMSEA = .105.

After examining the parameter estimates, two modifications were made to the standard model using just the 1989 wave. We reasoned that of the ten dyadic scores that are indicators for the parental actor and partner effects (i.e., FM, MF, FO, MO, FY, MY, OF, OM, YF, YM), the FM and MF scores are potentially distinct because they capture aspects of the marital dyad rather than family relationships involving children. Thus, when we specified the actor and partner latent variables for mothers and fathers, we allowed the factor loadings for the two scores from the marital dyad to be estimated rather than fixing them to one. These estimated loadings are represented as a , b , c , and d in Figure 1. For the 1989 data set, these loadings were: $a = .646$, $b = .585$, $c = .542$, and $d = .891$. (For 1990, these loadings were .667, .599, .863, and .292, respectively, and in 1991, these loadings were .693, .708, .598, and .469, respectively). Note that each of these loadings is less than one (although all were statistically significant), indicating that the fathers' and mothers' general tendency to

express and elicit positive engagement in their family interactions has a somewhat smaller role in their interactions with one another.

The second model modification was to allow for intragenerational correlations between the actor effects. Thus, mothers' and fathers' latent actor effects were allowed to correlate, as were the latent actor effects for the older children and younger children. These correlations specify that the general tendency to initiate positive engagement behaviors across all partners is similar for mothers and fathers, and likewise for the two children. These modifications resulted in a markedly improved model fit for the 1989 data: $\chi^2(41) = 137.27$, $p < .001$, CFI = .98, RMSEA = .07. We then tested whether these modifications could be cross-validated by applying the same specifications to the 1990 and 1991 waves of data. In both cases, the newly specified model was an improvement in overall fit - for 1990: $\chi^2(41) = 121.36$, $p < .001$, CFI = .98, RMSEA = .07; and for 1991, $\chi^2(41) = 107.00$, $p < .001$, CFI = .98, RMSEA = .06. We judged the fit of the modified models to be acceptable by current standards (e.g., Hu & Bentler, 1999).

The SRM variance estimates from these models are presented in Table 1. Note first that although all of the variances differed significantly from zero, some effects had consistently larger variances relative to others. Indeed the absolute magnitude of these variances is not as informative as their relative contribution to each dyadic score. Therefore Table 2 presents the relative percentage of variance in each dyadic measure that is accounted for by the SRM components. For instance, the first row of Table 2 shows that for FM behavior in 1989, 20.4% of the variance is attributable to the family mean, 35.2% of the variance is attributable to the father's actor effect, 2.8% of the variance is attributable to the mother's partner effect, and 41.5% is attributable to the unique dyadic relationship plus error. The final column in Table 2 presents the proportion of the total variance in each measure that is accounted for by the family mean, the actor effect, and the partner effect together (because relationship plus error is treated as the residual). These R^2 values are quite substantial, with an average value of .83 across dyad type and wave, indicating that intrafamily consistency (i.e., the family mean) and individual differences (i.e., actor and partner effects) account for an average of 83% of the variance in observed positive engagement behaviors.

Averaging across the values in the first column of Table 2, we find that the family mean accounts for an average of 27.5% of the variance in positive engagement across dyads and years. Thus, the family climate is a notable source of positive engagement behavior. The second column of Table 2 presents the percentage of variance accounted for by actor effects. Here we see that across dyads and years, 50.3% of the variance in positive engagement behaviors reflects individual differences – some individuals engage with all family members and others do not. A closer look at the second column suggests that parents' interactions with their children are especially driven by parents' individual differences in enacting positive behavior, with 67.3% of the variance due to parental actor effects. This finding suggests that: a) mothers and fathers tend to exhibit consistent levels of engagement behaviors with both children; and that b) in some families, these parental behaviors are quite positive, but in other families they are not. Although the children's actor variances were considerably smaller than those of their parents (see Table 1), on average, actor effects accounted for 43.8% of the variance in children's positive behavior across all family members (see Table 2).

Although partner variance was detectable at all three waves (see Table 1), Table 2 shows that the percentage of variance in positive engagement behaviors accounted for by partner effects was fairly small. Indeed, averaging across dyads and years, partner effects accounted for only 4.8% of the variance in positive engagement scores. This suggests there was a slight tendency for some individuals to elicit positive engagement from all family members;

however, unlike the pattern for actor variance, family role does not appear to moderate the size of these variances.

As can be seen in Table 2, more marked differences emerge in the relationship (plus error) variances, with relationship effects accounting for a substantially larger percentage of the variance in positive engagement scores for the marital dyad (an average of 37.3%) than for the other dyads (an average of 13.4%). Thus, in some families, fathers were especially engaged with the mothers (and vice versa), but in other families, the father-mother dyad was characterized by a lack of engagement. The positive engagement scores for the sibling dyad also showed elevated levels of relationship variance (an average of 21.6%) relative to parent-child scores (an average of 11.3%). Broadly speaking then, the relationship effect (plus error) tended to explain more variance in the horizontal relationships than the vertical relationships. Finally, it is noteworthy that even though the relationship effects include error, the average relationship effects (plus error) explain less than 20% of the variance in engagement scores, which is less than that accounted for by the family mean.

The generalized reciprocity, dyadic reciprocity, and intragenerational correlations for the three waves are presented in Table 3. The generalized reciprocity correlations were relatively large and statistically significant, with a mean across roles and waves of .59. These correlations suggest that regardless of family role, if a person exhibited a high level of positive behavior to other family members, that person also tended to elicit high levels of positive behavior from those family members. The small but statistically significant intragenerational actor correlations for parents indicate that in families in which mothers were positively engaged with all family members, fathers also tended to be engaged. In other words, parents were somewhat similar in their interactional style in terms of positive engagement. On the other hand, the two children's styles were only somewhat similar at the first wave of data collection.

There was strong evidence of dyadic reciprocity for the marital and sibling dyads at each of the three waves. For parents, this indicates that if the father was especially warm, attentive, and cooperative with the mother, the mother was especially warm, attentive, and cooperative with the father. Likewise, in families in which the older child was especially positive toward the younger child, the younger child reciprocated. There was somewhat less consistent evidence for dyadic reciprocity in the dyads involving mothers and their children, and there was no evidence of dyadic reciprocity in interactions between fathers and children.

In sum, these results provide evidence that variability in the expression of positive engagement within families is mainly a function of family norms and individual differences. An important caveat, however, is that the pattern of results for the horizontal relationships qualifies this generalization. That is, the expression of positive engagement behaviors within the marital and sibling dyads were relatively unique to those relationships. Moreover, the dyadic reciprocity correlations for these dyads indicate that the unique behaviors expressed by members within these dyads were reciprocated. The relatively small intragenerational correlations between parents' actor effects also provide evidence that parents are somewhat similar to one another in their engagement styles when interacting with their children. Last, there was evidence for generalized reciprocity across roles within the family, such that a family member who tended to display warm and supportive behaviors toward all other family members tended to be the recipient of similarly positive behaviors from those family members.

Stability in SRM Components over Time

We estimated the longitudinal stability of the SRM components by specifying a second-order latent variable model in which the SRM effects from the three time points served as

indicators of higher-order effects. Figure 2 presents this second-order latent variable model. Note that the manifest indicators are not depicted. Rather, the latent variables from Figure 1 are treated as occasion-specific indicators of the stable latent variables. Panel A in Figure 2 shows that the second-order family mean latent variable is indicated by the first-order family mean latent variables from 1989, 1990, and 1991. Panel B presents the second-order model for the actor and partner effects. Careful examination of this Panel shows that the covariances from the first-order model are also present for the second-order effects. In other words, like the first-order model, the second-order model includes generalized reciprocity correlations for each role as well as intragenerational actor correlations.

Specifying a model with second-order relationship effects posed a unique challenge. In our occasion-specific models we modeled the dyad-specific effects (i.e., relationship variances and dyadic reciprocities) using the residuals of the manifest variables. For example, there was a FM residual variance, a MF residual variance, and a FM-MF covariance between these two residuals. We interpreted the FM-MF covariance between the residuals as an indication of dyadic reciprocity. An equivalent specification would have been to treat both the FM and MF manifest variables as indicators of a latent FM relationship effect that estimated the degree to which there was unique variance in positive engagement behavior within the father-mother relationship. Indeed, the variance of this latent variable is exactly the same as the covariance between the FM and MF residuals. In the best of all worlds, we would have taken this approach with all of the relationship effects so that we could examine over-time stability in each. However, only the latent FM relationship effect showed enough stability to allow such a specification, and so the other relationship effects were treated as occasion-specific only. Panel C of Figure 2 presents the second-order relationship effect for the marital dyad.

The higher-order model resulted in reasonable model fit, $\chi^2(545) = 928.85, p < .001$, CFI = .973, RMSEA = .040. All variances for the stable and occasion-specific SRM effects were statistically significant (i.e., $p < .05$) with the exception of the occasion-specific partner variances in 1991 for fathers and older siblings. The significant variances for the stable effects provide evidence of consistency in positive engagement behaviors at the family level (i.e., the family mean), individual level (i.e., all of the actor and most of partner effects across roles), and dyad level (i.e., the relationship effect for the FM dyad).

Table 4 presents the percentage of variance in the time-specific SRM effects that was explained by the respective second-order latent factors. For example, the stable family mean factor accounted for 23% of the variability in the family mean in 1989, 18% of the family mean variability in 1990, and 31% of the family mean variability in 1991. Because of the complexity inherent in second-order latent variable models, a word of caution in interpreting these results is warranted. As was seen in Table 1, the magnitudes of the variances for the SRM components were not all consistent over time. As a result, this creates fluctuations in how much variance the second order factors can explain for a given time point. That is, if the variance for an effect at a particular time point was very small (e.g., the father partner effect in 1991), or variances fluctuated noticeably over time, then the estimates in Table 4 will vary from wave to wave. Accordingly, our primary focus in this analysis is on the results for the family mean, the four actor effects, and the marital relationship effect.

Approximately one fourth of the variance in the family mean was stable. Therefore even these brief conflict interactions that occurred in three separate years show evidence of consistent family norms for positive behaviors. In addition, there was considerable consistency in the actor effects across time such that approximately 40% of the variance in these effects was stable over time. Thus, there is clear evidence of stable individual differences in the exhibition of positive engagement behaviors. Finally, about one fifth of

the variance for the marital relationship effect was stable, suggesting some consistency in the unique nature of marital interactions.

Discussion

Our goal was to better understand the nature of observed positive engagement behavior in family interactions using the SRM. We first quantified the degree to which observed positive behaviors between two family members during a given year were a function of family-level, individual-level, and dyad-level factors. We then evaluated the stability of these factors using a longitudinal extension of the SRM. In the sections that follow we provide a more detailed discussion of the implications of our findings.

Understanding the Sources of Variability in Observed Positive Engagement

The cross-sectional SRM analyses yielded a number of insights into the nature of observed positive engagement behavior in families. We expected to find that the family mean and actor effects would explain a substantial amount of variance in positive engagement behaviors. Our results supported these predictions. We also expected that there would be more relationship variance in horizontal rather than vertical relationships, and indeed, levels of positive engagement were uniquely determined within the marital and sibling relationships.

Our findings for the family mean contrast with those of Eichelsheim et al. (2009) and Rasbash et al. (2011), who found that the family mean accounted for minimal variance in family relations. Notably, all of the studies reviewed by Eichelsheim et al. used self-reports, and so it is possible that the differing results are due to methodological differences. However, Rasbash et al. (2011) performed SRM analyses on observed positive behaviors and also found minimal variance in the family mean. One possible reason for this discrepancy is that Rasbash et al. (2011) observed one-on-one interactions between family members whereas the present research observed all four family members together. Empirical evidence suggests there may be differences in family members' behaviors when the full family, as opposed to particular dyads in the family, is observed (e.g., Buhrmester, Camparo, Christensen, Gonzalez, & Hinshaw, 1992). In the present study, the full-family interaction task may have primed family norms for positive engagement, thus leading to dyadic interactions that are more heavily explained by a positive family climate. Future research will be needed to explore this possibility.

As we have noted, our prediction that positive engagement behaviors would reflect a strong dispositional effect was supported. Large actor variances are commonly found in family research with self-reports (e.g., see Eichelsheim et al. 2009). These large actor variances underscore the need to consider the role that personal characteristics may play in family dynamics (see e.g., Conger & Donnellan, 2007). This finding also suggests that researchers who only observe a single specific dyadic interaction such as mother-child interactions, may need to consider the possibility that behaviors expressed in a particular dyad may reflect something more about the general tendencies of the individual enacting the behavior rather than something specific to her parenting relationship with her child. In contrast to the substantial size of the actor variances, the partner variances were consistently small across family role and assessment wave. Thus, there was only modest evidence that individuals vary in the degree to which they elicit positive engagement behaviors from all family members.

Three points regarding the relationship variances are worth noting. First, whereas variances in the relationship effects between parents and children were small, there was considerable variance in the marital relationship effects and the sibling relationship effects. Most research

using the SRM for families has found more variance in horizontal relationships (e.g., Rasbash et al., 2011), but it has also generally found substantial relationship plus error variance for the other dyads as well (Eichelsheim et al. 2009; Rasbash et al., 2011). Again, we believe that use of the full-family interaction task may help to explain this discrepancy; individuals' dispositional tendencies to behave positively may be more pronounced in the full-family interaction task. Consistent with this idea, the average relative percentage of variance in behavior explained by actor effects in the current study (i.e., 50.3%) was greater than the values reported by Eichelsheim et al. (2009; 34% for affect variables and 42% for influence variables) and Rasbash et al. (2011; on average, 28.5% for positivity). It may be that one-on-one interaction tasks pull for relationship-specific features whereas the full-family interaction task pulls for individual differences. Future research will be needed to evaluate these claims.

The other two points regarding the relationship variances both concern measurement error. Recall that the individual behavioral ratings had relatively low reliability coefficients. This low reliability meant increased error variability and it may have attenuated estimates of individual-level and family-level effects. Recall also that error was not separated from the relationship component in our analyses for each of the three waves. As a result, one might question whether the relationship-plus-error variances are meaningful. However, the presence of dyadic reciprocity correlations between the marital (and sibling) relationship effects is a compelling argument that at least some of the relationship-plus-error variance is in fact relationship variance, as these correlations can occur only if some of the variance is systematic.

Reciprocity and Intragenerational Processes

In spite of the small partner variances, we found generalized reciprocity for all family members. One interpretation for this configuration of results (i.e., large actor variances, small partner variances, and large generalized reciprocity) is that although positive engagement behaviors are substantially driven by individual differences, norms of reciprocity are also important. As Kenny, Mohr, and Levesque (2001) note, generalized reciprocity correlations with small partner variances may result because the actor effect drives the partner effect. To the extent that the exhibition of positive behavior is contingent on others, individuals who are especially positive towards all of their family members may tend to elicit similar behavior. This finding might help to explain the stability of family dynamics as it illustrates the capacity of individuals to perpetuate their environmental circumstances by evoking responses in others that match their dispositional tendencies (i.e., a supportive individual evokes supportive responses from others).

The unique reciprocation of positive engagement within the marital and sibling dyads is suggestive of intragenerational processes in families. Mothers who were especially positive to fathers received similar levels of positivity back, and this pattern held for sibling relationships as well. In other words, we found evidence of reciprocity among equals. Previous studies have found a similar pattern such that dyadic reciprocity correlations are stronger between members in horizontal relationships for a number of affective constructs (e.g., Eichelsheim et al., 2009; Rasbash et al., 2011). In addition to this, the intragenerational actor-actor correlation for the parents provided further evidence of intragenerational processes in the family by suggesting the existence of a parental alliance in the expression of positive engagement behaviors. It should be noted, however, that the magnitude of this relation was relatively small.

Consistency over Time in Family Dynamics

One of the more novel aspects of the present study involved the longitudinal analyses. As noted, we observed an appreciable degree of longitudinal consistency for many of the SRM components. This observation is noteworthy for two reasons: (a) it is likely that family members discussed different issues at separate assessments; and (b) our data were based on behavioral coding of three *15-minute* interactions that occurred across a three-year period. Our over-time analysis indicated that about 25% of the variance in the family mean was consistent across the three years. This is compelling support for the existence of a general family climate or family norm for positive engagement behavior and suggests that families that are generally warm and supportive at one time point are likely to be warm and supportive in the future. These findings are in line with family systems theories that suggest that there will be a fair degree of stability because of adaptive self-stabilization processes (Cox & Paley, 1997). These findings also compare favorably with the size of stability coefficients associated with variables such as family cohesion (Gehring & Feldman, 1988).

A similar and perhaps even stronger set of findings emerged for the actor variances. These variances were relatively substantial in the cross-sectional analyses, and the longitudinal SRM analyses found considerable consistency. For each of the four roles, about 40% of the variance in the actor effects was stable over the three-year period. This suggests that positive engagement behaviors are tied, at least in part, to enduring individual dispositions. Other research has also found relatively high stability coefficients for general personality attributes (Roberts & DelVecchio, 2000) as well as for parental warmth across 2-year intervals (Eisenberg et al., 2005). Thus, the longitudinal findings help to further support our contention that dispositional characteristics play an important role in family dynamics.

Limitations and Concluding Comments

Although the application of the SRM to behavioral data has provided some important insights into the nature and stability of positive engagement in families, there are important limitations that should be noted. One limitation is that the sample we used was exclusively European American and drawn from rural Iowa. In addition, this study (which began over 20 years ago) was originally implemented to investigate how rural families adapt to poor economic conditions. These particulars about our sample may lead to some concern about potential cohort effects, and future research will be needed to determine whether our results generalize to families of different ethnicities, geographical locations, and time periods. We also need to point out that the data used in this paper have been used in other research that has tied expressions of positive behavior in the family-of-origin to outcomes in later parenting (Nepl, Conger, Scaramella, & Ontai, 2009) and romantic relationships (Conger et al., 2000). Broadly speaking, these studies have shown that children from families in which positive engagement behaviors occurred frequently have more positive outcomes later in life. Future research using the SRM may help to provide an even more refined understanding of the family-based factors that are responsible for these outcomes.

In terms of modeling issues, we had to modify the SRM for the current data to accommodate the unique features of the marital relationship. We emphasize that our modifications were cross-validated at subsequent waves and that the results are in accord with theoretical expectations. It is also important to recognize broader limitations related to the application of the SRM to family data. A central principle in family systems theories is that interpersonal behavior in families may reflect higher-order processes (e.g., triadic coalitions, reciprocity between subsystems), but the SRM for families only models family-level, dyad-level, and individual-level effects. Indeed, the basic building blocks of the SRM are dyadic interactions. Thus, the SRM does not comprehensively address all of the complexities

inherent in family dynamics; however, we believe that it is a substantial methodological improvement over single-informant perspectives.

Despite these limitations, this research has an important implication for researchers interested in family dynamics: Dyadic behavior may not necessarily be unique to the dyad. That is, an observation that a mother is warm and supportive of her child may say less about her unique parenting behavior, and more about the family as a whole or the mother as an individual. Accordingly, researchers should consider the broader family climate, as well as individual characteristics of the family members, when studying family relationships. This fact may necessitate more intensive data collection strategies that include family-level and individual-level assessments, along with assessments of the focal dyad.

In sum, the goal of this research was to better understand the dynamics of positive interpersonal behavior in families with adolescent children. Our results highlight the presence of family norms for positive engagement, the importance of stable (or dispositional) factors in determining positive engagement, and the uniqueness of behavior within the marital and sibling dyads. These findings are useful for developing further theories about the origins of positive behaviors in families. All in all, we have shown that the SRM can be a useful tool for studying family contexts and we hope that future studies continue to bridge the gap between the complexities of current theory and the techniques used to study the family.

Acknowledgments

This research is currently supported by grants from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, the National Institute of Mental Health, and the American Recovery and Reinvestment Act (HD064687, HD051746, MH051361, and HD047573). The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding agencies. Support for earlier years of the study also came from multiple sources, including the National Institute of Mental Health (MH00567, MH19734, MH43270, MH59355, MH62989, and MH48165), the National Institute on Drug Abuse (DA05347), the National Institute of Child Health and Human Development (HD027724), the Bureau of Maternal and Child Health (MCJ-109572), and the MacArthur Foundation Research Network on Successful Adolescent Development Among Youth in High-Risk Settings. The authors thank Kathi Conger, Gregory Fosco, and David Kenny for helpful comments on a previous draft. The authors also thank Sarah K. Spilman for her assistance in determining the interrater reliabilities for the coders.

References

- Branje SJT, van Lieshout CFM, van Aken MAG. Relations between agreeableness and perceived support in family relationships: Why nice people are not always supportive. *International Journal of Behavioral Development*. 2005; 29:120–128. DOI: 10.1080/01650250444000441.
- Buhrmester D, Camparo L, Christensen A, Gonzalez LS, Hinshaw SP. Mothers and fathers interacting in dyads and triads with normal and hyperactive sons. *Developmental Psychology*. 1992; 28:500–509. DOI: 10.1037/0012-1649.28.3.500.
- Buist KL, Reitz E, Dekovic M. Attachment stability and change during adolescence: A longitudinal application of the social relations model. *Journal of Social and Personal Relationships*. 2008; 25(3): 429–444. DOI: 10.1177/0265407508090867.
- Choukalas, C.; Melby, JN.; Lorenz, FO. Technical report: Intraclass correlation procedures in SPSS. Iowa State University, Institute for Social and Behavioral Research; Ames: 2000. Unpublished manuscript
- Collins WA, Maccoby EE, Steinberg L, Hetherington EM, Bornstein MH. Contemporary research on parenting: The case for nature and nurture. *American Psychologist*. 2000; 55:218–232. DOI : 10.1037/0003-066X.55.2.218. [PubMed: 10717969]
- Conger RD, Cui M, Bryant CM, Elder GH. Competence in early adult romantic relationships: A developmental perspective on family influences. *Journal of Personality and Social Psychology*. 2000; 79(2):224–237. DOI: 10.1037/0022-3514.79.2.224. [PubMed: 10948976]

- Conger RD, Donnellan MB. An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology*. 2007; 58:175–199. DOI: 10.1146/annurev.psych.58.110405.085551.
- Cox MJ, Paley B. Families as systems. *Annual Review of Psychology*. 1997; 48:243–267. DOI: 10.1146/annurev.psych.48.1.243.
- Davidov M, Grusec JE. Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development*. 2006; 77(1):44–58. DOI: 10.1111/j.1467-8624.2006.00855.x. [PubMed: 16460524]
- Delsing MJMH, Oud JHL, De Bruyn EE, van-Aken MAG. Current and recollected perceptions of family relationships: The Social Relations Model approach applied to members of three generations. *Journal of Family Psychology*. 2003; 17:445–459. DOI: 10.1037/0893-3200.17.4.445. [PubMed: 14640796]
- Eichelsheim VI, Dekovic M, Buist KL, Cook WL. The social relations model in family studies: A systematic review. *Journal of Marriage and the Family*. 2009; 71:1052–1069. DOI: 10.1111/j.1741-3737.2009.00652.x.
- Eisenberg N, Zhou Q, Spinrad TL, Valiente C, Fabes RA, Liew J. Relations among positive parenting, children's effortful control, and externalizing problems: A three-waved longitudinal study. *Child Development*. 2005; 76:1055–1071. DOI: 10.1111/j.1467-8624.2005.00897.x. [PubMed: 16150002]
- Finkenauer C, Engels RCME, Branje S, Meeus W. Disclosure and relationship satisfaction in families. *Journal of Marriage and Family*. 2004; 66:195–209. DOI: 10.1111/j.0022-2445.2004.00014.x.
- Gable S, Crnic K, Belsky J. Coparenting within the family system: Influences on children's development. *Family Relations*. 1995; 43:380–386. DOI: 10.2307/585368.
- Gehring TM, Feldman SS. Adolescents' perceptions of family cohesion and power: A methodological study of the family system test. *Journal of Adolescent Research*. 1988; 3(1):33–52. DOI: 10.1177/074355488831004.
- Halberstadt AG, Eaton KL. A meta-analysis of family expressiveness and children's emotion expressiveness and understanding. *Marriage and Family Review*. 2002; 34:35–62. DOI: 10.1300/J002v34n01_03.
- Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*. 1999; 6:1–55. DOI: 10.1080/10705519909540118.
- Kenny, DA.; Kashy, DA.; Cook, WL. *Dyadic Data Analysis*. Guilford Press; New York: 2006.
- Kenny DA, Mohr CD, Levesque MJ. A social relations variance partitioning of dyadic behavior. *Psychological Bulletin*. 2001; 127(1):128–141. DOI : 10.1037/0033-2909.127.1.128. [PubMed: 11271751]
- Kramer L. The essential ingredients of successful sibling relationships: An emerging framework for advancing theory and practice. *Child Development Perspectives*. 2010; 4:80–86.
- McCoy K, Cummings EM, Davies PT. Constructive and destructive marital conflict, emotional security and children's prosocial behavior. *Journal of Child Psychology and Psychiatry*. 2009; 50:270–279. DOI: 10.1111/j.1469-7610.2008.01945.x. [PubMed: 18673403]
- Melby, JN.; Conger, RD. The Iowa family interaction rating scales: Instrument summary.. In: Kerig, PK.; Lindahl, KM., editors. *Family Observational Coding Systems: Resources for Systemic Research*. LEA, Inc.; Mahwah, NJ: 2001. p. 33-57.
- Neppel TK, Conger RD, Scaramella LV, Ontai LL. Intergenerational continuity in parenting behavior: Mediating pathways and child effects. *Developmental Psychology*. 2009; 45:1241–1256. DOI: 10.1037/a0014850. [PubMed: 19702389]
- Rasbash J, Jenkins J, O'Connor TG, Tackett J, Reiss D. A social relations model of observed family negativity and positivity using a genetically informative sample. *Journal of Personality and Social Psychology*. 2011; 100:474–491. DOI: 10.1037/a0020931. [PubMed: 21341926]
- Roberts BW, DelVecchio WF. The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*. 2000; 126:3–25. DOI: 10.1037/0033-2909.126.1.3. [PubMed: 10668348]

van-Aken, MAG.; Oud, JHL.; Mathijssen, JJP.; Koot, HM. The Social Relations Model in research on family systems.. In: Gerris, JRM., editor. Dynamics of parenting. Erlbaum; Hillsdale, NJ: 1998. p. 115-130.

Figure 1.

The full SRM model for a single time point (e.g., 1989) is depicted in two panels. The model is estimated as a single model in which the actor effects, partner effects, family mean, and relationship effects are all estimated simultaneously.

Figure 2.

The second order latent variable model depicting the multiple-wave SRM across three time points (1989, 1990, 1991).

Table 1

Variance in the Social Relations Model factors for positive engagement in families at three time points

<i>Social Relations Model Component</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>
Family Mean	.086	.100	.056
Actor			
Father	.356	.313	.223
Mother	.286	.268	.194
Older Child	.153	.091	.096
Younger Child	.133	.081	.080
Partner			
Father	.034	.019	.007
Mother	.015	.018	.005
Older Child	.011	.014	.009
Younger Child	.030	.020	.013
Relationship plus error			
Father-Mother	.175	.110	.075
Father-Older	.040	.024	.027
Father-Younger	.039	.043	.027
Mother-Father	.197	.137	.065
Mother-Older	.043	.049	.038
Mother-Younger	.030	.028	.039
Older-Father	.035	.027	.021
Older-Mother	.041	.042	.027
Older-Younger	.076	.057	.040
Younger-Father	.044	.037	.019
Younger-Mother	.035	.036	.023
Younger-Older	.066	.061	.038

Note. All variances are significant at the $p < .05$ level.

Table 2

Percentage of variance in positive engagement scores explained by Social Relations Model components in 1989, 1990, and 1991.

Social Relations Model Components					
1989	Family Mean	Actor	Partner	Relationship Plus Error	R ²
Father to Mother	20.40	35.25	2.83	41.52	.59
Father to Older	17.44	72.21	2.23	8.11	.92
Father to Younger	16.83	69.67	5.87	7.63	.92
Mother to Father	22.00	25.04	2.56	50.40	.50
Mother to Older	20.19	67.14	2.58	10.09	.90
Mother to Younger	19.91	66.20	6.94	6.94	.93
Older to Father	27.92	49.68	11.04	11.36	.89
Older to Mother	29.15	51.86	5.08	13.90	.86
Older to Younger	24.93	44.35	8.70	22.03	.78
Younger to Father	28.96	44.78	11.45	14.81	.85
Younger to Mother	31.97	49.44	5.58	13.01	.87
Younger to Older	29.05	44.93	3.72	22.30	.78
1990					
Father to Mother	28.51	39.70	.44	31.36	.69
Father to Older	22.17	69.40	3.10	5.32	.95
Father to Younger	21.01	65.76	4.20	9.03	.91
Mother to Father	28.79	27.69	4.07	39.45	.61
Mother to Older	23.20	62.18	3.25	11.37	.89
Mother to Younger	24.04	64.42	4.81	6.73	.93
Older to Father	42.19	38.40	8.02	11.39	.88
Older to Mother	39.84	36.25	7.17	16.73	.83
Older to Younger	37.31	33.96	7.46	21.27	.79
Younger to Father	42.19	34.18	8.02	15.61	.84
Younger to Mother	42.55	34.47	7.66	15.32	.85
Younger to Older	39.06	31.64	5.47	23.83	.76
1991					
Father to Mother	23.41	44.77	.46	31.36	.69
Father to Older	17.78	70.79	2.86	8.57	.91

Father to Younger	17.55	69.91	4.08	8.46	.92
Mother to Father	25.37	44.05	1.13	29.45	.71
Mother to Older	18.86	65.32	3.03	12.79	.87
Mother to Younger	18.54	64.24	4.30	12.91	.87
Older to Father	31.11	53.33	3.89	11.67	.88
Older to Mother	30.43	52.17	2.72	14.67	.86
Older to Younger	27.32	46.83	6.34	19.51	.81
Younger to Father	34.57	49.38	4.32	11.73	.88
Younger to Mother	34.15	48.78	3.05	14.02	.86
Younger to Older	30.60	43.72	4.92	20.77	.79

Table 3

Social Relations Model reciprocity correlations for positive engagement in 1989, 1990, and 1991.

	<i>Reciprocity correlations</i>		
Generalized Reciprocity	<i>1989</i>	<i>1990</i>	<i>1991</i>
Father	.71 **	.64 **	.46 **
Mother	.63 **	.56 **	.55 **
Older	.69 **	.61 **	.68 **
Younger	.46 **	.53 **	.52 **
Intra-generational Actor			
Parents	.18 **	.29 **	.28 **
Children	.19 *	-.01	.13
Dyadic Reciprocity			
Father-Mother	.61 **	.57 **	.43 **
Father-Older	.19	.26	.16
Father-Younger	-.01	.05	.00
Mother-Older	.01	.41 **	.33 **
Mother-Younger	.11	.21	.20 *
Older -Younger	.48 **	.37 **	.42 **

Note.

*
 $p < .05$.**
 $p < .001$.

Table 4

Percentage of variance in time-specific Social Relations Model (SRM) components explained by the respective second order model factors.

<i>SRM Component</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>	<i>Mean over time</i>
Family Mean	22.6	18.3	31.4	24.1
Father Actor	34.3	39.5	50.6	41.5
Mother Actor	33.6	36.0	44.5	38.0
Older Actor	29.6	67.6	67.6	54.9
Younger Actor	24.1	40.2	35.8	33.4
Father Partner	26.5	50.5	95.2	57.4
Mother Partner	35.7	35.7	35.7	35.7
Older Partner	13.8	29.0	54.4	32.4
Younger Partner	34.7	34.7	34.7	34.7
Marital Relationship	9.8	16.2	34.7	20.2