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Balance in Family Triads: How Intergenerational Relationships Affect the Adult Sibling Relationship

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Abstract

In order to understand the interdependency between intergenerational and adult sibling relationships, a family systems perspective is applied to identify a smaller—empirically analyzable—relational unit of analysis, that is, the sibling–parent–sibling triad. Using balance theory, triadic configurations are derived that represent enhancement, compensation, and loyalty conflicts. The hypotheses are tested for three relational dimensions: support exchange, contact, and conflict. Multilevel analyses of 549 sibling–parent–sibling triads from the Netherlands Kinship Panel data show strong evidence for enhancement, whereas some indication was obtained for sibling relationships being affected by loyalty conflicts. The results underscore and substantiate interdependency between intergenerational and adult sibling relationships.

Keywords

adult sibling relationships, intergenerational relationships, intragenerational relationships, balance theory, family triads, family systems theory, enhancement, compensation, loyalty conflict, support exchange, contact frequency, conflict, Western European families, multilevel models

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Introduction

Many family relationships last a lifetime and are less “escapable” compared with other personal relationships. This involuntary character of family relationships stresses the importance of the web of family relationships keeping its balance to minimize the risk of tensions and stress. Of all family relationships, sibling relationships have the longest duration (Cicirelli, 1995; Matthews, 2002; van Gaalen, Dykstra, & Flap, 2008; Voorpostel, Dykstra, & Flap, 2007; Voorpostel, van der Lippe, & Flap, 2012). The development of strong adult sibling relationships forms an important source of support for adults over the life course (e.g., Cicirelli, 1995; Eriksen & Gerstel, 2002; Kalmijn & Leopold, 2019; Milevsky, 2005; Spitze & Trent, 2006; Voorpostel & Blieszner, 2008; Voorpostel et al., 2007; White & Riedmann, 1992).

Although previous research acknowledges interdependencies between family relationships, which means that the quality and strength of one family relationship is dependent on the quality and strength other family relationships, relatively few studies examined the association of sibling relationships with other family relationships. Past studies mainly focus on associations between the *intergenerational* relationship, between parents and children, and the *intragenerational* relationships, between adolescent and adult siblings, and base their theoretical arguments on attachment theory, social learning theory, or differences in parenting style (see Whiteman, McHale, & Soli, 2011 for an overview).

The positive association between the intergenerational and the sibling relationship, found by most studies, is known as “enhancement,” “congruence” (Derkman, Engels, Kuntsche, van der Vorst, & Scholte, 2011 during adolescence; Portner & Riggs, 2016 during emerging adulthood), “spillover” (Derkman et al., 2011 during adulthood; Hank & Steinbach, 2018 during adulthood), “reinforcement” (Hank & Steinbach, 2018), or “concordance” (Whiteman et al., 2011). A negative association indicates “compensation” of weak intergenerational relationships by strong sibling relationships. These studies use several dimensions of the parent–child relationship, such as parental care and support (Portner & Riggs, 2016), relationship quality (Voorpostel & Blieszner, 2008 during adulthood), emotional closeness and intimacy (Hank & Steinbach, 2018), support (Derkman et al., 2011; Milevsky, 2005 during emerging adulthood), contact (Hank & Steinbach, 2018; Voorpostel & Blieszner, 2008), and conflict (Hank & Steinbach, 2018). Dimensions of the sibling relationship are for example emotional closeness and intimacy (Hank & Steinbach, 2018), affect (Portner & Riggs, 2016), warmth (Derkman et al., 2011), support (Milevsky, 2005; Voorpostel & Blieszner, 2008), contact (Hank & Steinbach, 2018), conflict (Derkman et al.,

2011; Hank & Steinbach, 2018), and behaviors and cognition (Portner & Riggs, 2016).

As also proposed by Hank and Steinbach (2018), the dependence between intergenerational and intragenerational relationships can be approached by family systems theory (Cox & Paley, 1997; Minuchin, 1974) with the key assumption that all family relationships are interdependent. Whiteman et al. (2011) acknowledge in their theoretical overview that family systems are hard to operationalize and therefore challenging to analyze. It requires dividing the system in smaller—empirically analyzable—relational units, such as dyads or triads, and theorizing on processes or mechanisms within these configurations. We propose balance theory (Cartwright & Harary, 1956; Heider, 1946, 1958) to define enhancement, compensation, and loyalty conflicts, as forms of interdependence within sibling–parent–sibling triads, as well as a way to empirically measure and test systems theory.

The data come from the Netherlands Kinship Panel Study (NKPS), which is a large-scale multiactor panel study collected in 2002 to 2004 on the nature and strength of family ties in the Netherlands (Dykstra et al., 2005). Based on the multiple dimensions of the solidarity–conflict model (Bengtson, Giarrusso, Mabry, & Silverstein, 2002; Silverstein, Gans, Lowenstein, Giarrusso, & Bengtson, 2010), we focus on three dimensions of the relationships between siblings and their parents: support exchange, contact frequency, and conflict in the study.

Theory

Family systems theory (Cox & Paley, 1997; Minuchin, 1974) implies that relationships between two family members such as the sibling relationship dyad cannot be studied in isolation as they are part of a larger system and affected by surrounding family relationships such as the intergenerational relationships of both siblings. The first and most straightforward way to take interdependence into account is by studying triads, that is, relationships between three family members, in this study, the sibling–parent–sibling triad.

Structural balance is an important characteristic of triads, proposed by Heider (1946, 1958) and further elaborated by Cartwright and Harary (1956). The concept of balance is also well known in social network analysis (e.g., Wasserman & Faust, 1994). A recent application of balance theory by Rawlings and Friedkin (2017) provides an extensive general theoretical framework, as well testable hypotheses of balance in triadic configurations in multiple—nonfamily—communities. Using positive and negative—undirected—relationships, balanced triads occur in two forms: either all three individuals have positive—strong—relationships, “the all-positive triad,” or

Table 1. Balancing Mechanism: Expected Sibling Relationship Strength.

	Sibling 2—Parent weak	Sibling 2—Parent strong
Sibling 1—Parent weak	<i>Sibling relationship strong</i>	<i>Sibling relationship weak</i>
Sibling 1—Parent strong	<i>Sibling relationship weak</i>	<i>Sibling relationship strong</i>

two individuals in the triad have a positive relationship, while they both share a negative—weak—tie with the third individual. Thus, in a balanced triad, the multiplication of the three relationships is positive. An imbalanced triad, on the other hand, leads to a negative multiplication result: It is defined by a triad in which one individual has a positive relationship with the two others whose relationship is negative. Thus, the “all-negative” triad is imbalanced as well. Heider (1946, 1958) and Cartwright and Harary (1956) argue that individuals in triadic configurations prefer to be part of a balanced triad. An imbalanced triad is not stable because of the tension caused by the two individuals having a weak relationship while sharing a same-valued—strong or weak—relationship with a third individual. This mechanism was shown empirically by Rawlings and Friedkin (2017).

In this article, we study sibling—parent—sibling triads, focusing on the base relation formed by two siblings (see Table 1). If both siblings have a strong relationship to their parent, a triad with a strong sibling relationship displays structural balance: the all-positive triad. If one sibling has a weak—negative—relationship to the parent and the other sibling a strong—positive—relationship to the parent, structural balance is obtained if the siblings have a weak relationship with each other. If both siblings have a weak relationship to the parent, structural balance is obtained by a strong sibling relationship.

The balanced state of the “all-positive triad” fits in with the enhancement mechanism (see Triad A in Figure 1), although in previous literature the relationship between the second sibling and parent was not explicitly evaluated. Therefore, the all-positive triad represents enhancement from both siblings’ perspectives. The “other” balanced state—when the siblings in the triad have a strong relationship, while they both do not get along with their parent—fits in with the compensation mechanism as depicted in Triad B, Figure 1.

Triad C in Figure 1 shows one sibling having a strong relationship with the parent, while the other sibling has a weak relationship with the parent. When the sibling relationship is strong, the triad becomes unbalanced from the perspective of the sibling with the strong relationship to the parent. This situation is indicative for tension in the sibling relationship, as the sibling with the strong relationship to the parent likely has the feeling of having to choose sides between the parent and the sibling with the weak relationship to the

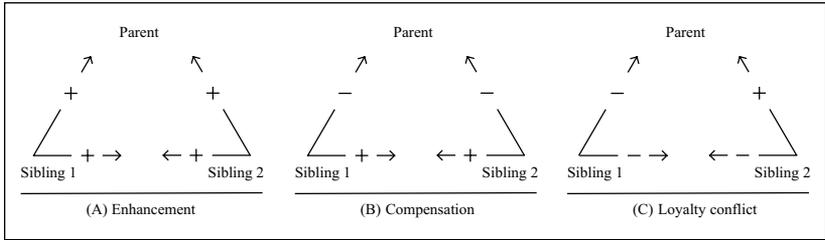


Figure 1. Balancing Mechanisms in Sibling-parent-sibling Triads.

parent. Amato and Afifi (2006; see also Sobolewski & Amato, 2007) describe the unbalanced triadic configuration where a child is caught between the negative relationship of his or her parents and his or her own positive relationships with both parents as a loyalty conflict, which we now apply to the intergenerational and sibling relationship. Triad C in Figure 1 illustrates that the disparity between both siblings’ intergenerational relationships leads to a negative force on the sibling relationship. The balance in the sibling–parent–sibling triad is restored when the sibling tie becomes negative.

To summarize the three triadic configurations reflecting enhancement, compensation, and loyalty conflicts, we formulate three hypotheses on each of the three relational dimensions: support exchange, contact, and conflict. The stronger the own intergenerational relationship, the stronger the sibling relationship (Hypothesis 1a: enhancement). The weaker the intergenerational relationship, the stronger the sibling relationship (Hypothesis 1b: compensation). Larger dissimilarities between the two intergenerational relationships are negatively associated to the sibling relationship (Hypothesis 2: loyalty conflicts). The hypotheses are tested empirically from the perspective of both siblings simultaneously using multilevel modeling.

Method

The NKPS is a large-scale multiactor panel study on the nature and strength of family ties in the Netherlands (Dykstra et al., 2005). The NKPS is based on a random probability sample of addresses in the Netherlands. At each address, one adult person aged 18 to 79 years was randomly selected for a face-to-face interview. Respondents received a small monetary incentive for their participation. The overall response rate was 45%, which is a little below average for the Netherlands (de Leeuw & de Heer, 2002). Comparisons with population data show that some groups were somewhat underrepresented, that is, men, individuals younger than 30 years or older than 70 years, and individuals living alone (for details, see Dykstra et al., 2005).

Sample

The primary respondent was interviewed face-to-face about his or her family relationships. Family members such as parents, children, and siblings served as secondary respondents. Primary respondents were asked for the address of these family members and if these addresses were given, randomly selected family members received a self-completion questionnaire by postal mail. In this study, we use data from the primary respondents and from their siblings as a secondary respondent, not from parents. The information on primary respondents and their siblings is symmetrical because both report about the relationship with their father, mother, and their sibling. Individual characteristics were also measured in the same way for primary and secondary respondents.

In total, 60% of the primary respondents were willing to share the address of their sibling and of these, 63% returned the questionnaire. While this multiactor approach in the context of a large national survey was rather new in European research at the time, it is not without problems. Previous studies have shown that nonresponse of secondary respondents in NKPS is selective with respect to relationship quality, although generally not affecting regression parameter estimates (Kalmijn & Liefbroer, 2011).

In order to avert cohort effects and to foster comparability, we selected sibling pairs from the 8,161 sibling pairs who were both 18 to 40 years old, based on the reports of the primary respondent. This selection resulted in a sample of 2,365 cases. Because information about contact and support related to household tasks and odd jobs between siblings and their parents was only collected if siblings and parents did not coreside, sibling couples were selected who neither coresided with each other nor with their parents ($N = 761$). In the final selection step, sibling couples with incomplete information on intergenerational relationships and the control variables were omitted from the sample, resulting in 549 sibling couples for analysis.¹ The descriptive statistics are represented in Table 2.

The main difference between our analytical smaller sample ($N = 549$) and the larger sample of 18- to 40-year-old respondents from the larger sample of sibling pairs ($N = 2,365$ if all cases are available; results available on request), is that siblings in the analytical sample are older, higher educated, experienced parental divorce and parental conflict less often, whereas primary respondents are also more religious. Secondary respondents in the analytical sample live further away from the primary respondent and their parents, whereas primary respondents live further away from their mother. With regard to support exchange and contact, primary respondents reported more contact with their sibling and parents, and more support exchange with their father, whereas secondary respondents reported

Table 2. Descriptive Statistics ($N = 549$).

	Sibling 1		Sibling 2		t or χ^2
	M	SD	M	SD	
Support exchange with sibling	1.69 ^a	0.36	1.83 ^b	0.38	-8.39*
Contact frequency with sibling	4.17	0.86	4.17 ^a	0.86	0.14
Conflict with sibling	0.13		0.24		39.79*
Support exchange with father	1.91	0.37	1.94	0.38	-1.50
Contact frequency with father	4.58	0.89	4.62	0.93	-0.84
Conflict with father	0.20		0.31		6.26*
Support exchange with mother	2.01	0.38	2.06	0.40	-2.31*
Contact frequency with mother	4.94	0.88	4.88	0.86	1.42
Conflict with mother	0.18		0.34		16.34*
Age	31.34	4.78	31.79	5.02	-2.68*
Gender (0 = male)	0.65		0.60		0.08
Education	0.36	0.69	0.28	0.71	2.35*
Religion	1.64	0.93	1.62	0.95	0.73
Geographical distance to father (log)	2.53	1.53	2.40	1.55	1.66
Geographical distance to mother (log)	2.51	1.52	2.40	1.55	1.50
Geographical distance between siblings (log)	2.79	1.52			
Geographical distance to father (km)	32.14	42.24	30.91	45.70	
Geographical distance to mother (km)	31.61	41.82	31.02	45.83	
Geographical distance between siblings (km)	39.38	47.78			
Parental divorce	0.10				
Parental conflict	1.40	0.38			
More siblings in family	0.51				

Note. ^a $N = 548$. ^b $N = 546$.

* $p < .05$, two-sided p value.

fewer support exchange with their sibling and more support exchange and contact with their father. The analytical sample was characterized by fewer conflict between the secondary respondents with their sibling and their mother than the larger sample.

Relationship Variables

We analyze three relationship characteristics, support exchange, contact, and conflict, and we have six types of reports about these: (a) the primary respondent reporting about the sibling, (b) the primary respondent reporting about the father, (c) the primary respondent reporting about the mother, (d) the

sibling (secondary respondent) reporting about the primary respondent, (e) the sibling reporting about the father, and (f) the sibling respondent reporting about the mother.

Support Exchange. The measure for support exchange in the NKPS was based on the family solidarity tradition in sociology where much emphasis is given to the exchange of emotional, instrumental and material support (Bengtson et al., 2002; Silverstein et al., 2010). Since some types of support were frequently missing (e.g., financial support) or not always applicable (e.g., help with childcare), the support exchange measurement in this study is based on emotional and instrumental support. The phrasing of all items was exactly identical for sibling and intergenerational relationships.

The support exchange variable is constructed by combining eight items that questioned whether the siblings during the past 3 months (a) gave help to and (b) received help from each other and their parents regarding household tasks, (c) gave help to and (d) received help from each other and their parents regarding odd jobs in the household, (e) showed interest in (f) received interest from each other and their parents, (g) gave advice to, and (h) received advice from each other and their parents. All items were measured on a 3-point scale (“not at all,” “once or twice,” “several times”). At least five of these eight items needed to be present, to use their mean as the value of the support exchange variable. The reliabilities of the support exchange variable, reported in Appendix A, were good for all sibling–parent and sibling–sibling relationships, ranging from 0.67 (primary respondent–father) to 0.78 (secondary respondent–primary respondent). Table 2 shows that intergenerational support exchange is higher than sibling support exchange, and is highest for mothers. Furthermore, secondary respondents report higher levels of support exchange with their sibling and their mother compared with primary respondents. Moreover, support exchange between siblings is highly correlated with intergenerational support exchange and with sibling and intergenerational contact. Sibling support exchange is negatively correlated with sibling age, geographical distance between siblings, and having multiple siblings. Support exchange reported by women is higher than support exchange reported by men. Intergenerational support exchange with father and with mother are highly correlated (see Appendix C for details).

Contact. The contact variable is constructed by averaging two items; an item that measured face-to-face contact and an item that measured phone, letter, and e-mail contact in the past 12 months. The two items were measured on a 7-point scale (“not at all,” “once,” a few times a year,” “at least once a month,” “at least once a week,” “a few times a week,” and “daily”). If only

one of these items was known, we used that single item. Table 2 shows that contact with mothers was highest, with small and nonsignificant differences between the two sibling reports. In additional analyses (available on request), we scaled the contact variable by taking the natural logarithm of the approximate annual frequencies (Kalmijn, 2006; Waite & Harrison, 1992) plus one, which resulted in a distribution with similar shape and similar results. Contact between siblings, similar to support exchange between siblings, is highly correlated with intergenerational contact and negatively correlated with age, geographical distance between siblings, and having more siblings. Female respondents report more contact than male respondents. Intergenerational contact with father and with mother are highly correlated (see Appendix C for details).

Conflict. The conflict variable is based on one item measuring the amount of conflict and tension during the past 3 months. The variable has three categories: no conflict at all, once or twice, and several times. Because the item is quite skewed with predominantly relationships in the “no conflict at all” category (see distributions in Appendix B), it was transformed into a dichotomous variable, indicating relationships with at least once or twice conflict in the past 3 months. Secondary respondents reported more conflict than primary respondents (see Table 2). Due to low occurrence of conflict, the ϕ coefficients measuring the association of conflict within sibling dyads and between siblings and their parents are weak. Intergenerational conflict with father and with mother are somewhat stronger correlated, especially for secondary respondents. (see Appendix C for details).

Control Variables

A number of control variables representing family context and individual characteristics were included in the analysis. Previous research showed that parental divorce and parental conflict affect the quality and strength of family relationships (Amato, 2000, 2010, 2014; Poortman & Voorpostel, 2009; Riggio, 2001), which makes them important control variables. Both variables are reported by the primary respondent. Table 2 shows that 11% of the primary respondents reported to have divorced parents. The parental conflict scale is constructed by five items measuring whether (a) parents had fierce discussions, (b) parents had strong reproaches, (c) parents did not talk, (d) parents' quarrels escalated, and (e) parents did not live together for some time when the respondent was 15 years old. Unfortunately, no information on parental conflict at the time of the data collection was available. In case parents were divorced or separated, this question referred back to the time period

preceding the divorce or separation. The last four items were measured with three answer categories: "not at all," "once or twice," and "several times." The first item was measured with four answer categories, representing "not at all," "once or twice," "several times," and "parents never lived together." Respondents who answered that their parents never lived together were recoded as missing on this item, after which all items consisted of a 3-point scale and were averaged ($M = 1.40$, see Table 2, $\alpha = .7341$, see Appendix A). At least three items needed to be present in order to obtain a value for parental conflict.

The third family context control variable indicates whether the siblings have more brothers and sisters, as this may imply variability in sibling relationship quality, whereas only one other sibling is included in the analysis. Fifty-one percent of the primary respondents reported having more siblings than the sibling participating as the secondary respondent.

Geographical distance is an important determinant for support giving between family members (Mulder & van der Meer, 2009). Geographical distance between the four family members, two siblings and both parents, is available based on the X and Y coordinates for these four family members. Because of its skewed distributions, the distance variables are obtained by the natural logarithm of the distances in kilometers (Kalmijn, 2006; Waite & Harrison, 1992) plus one. Note that distance is endogenous as it can also be the outcome of a poor sibling relationship.

Individual control variables are age, gender, education, and religion. Whereas primary and secondary respondents are on average 31 years old, secondary respondents are on average 4 to 5 months older than the primary respondents. Sixty-five percent of the primary respondents and 60% of the secondary respondents are female. Education of both siblings is categorized in three levels: low (-1), medium (0), and high (1). Table 2 shows that primary respondents are significantly higher educated. Because religious families have different norms about maintaining family relationships (Gans, Silverstein, & Lowenstein, 2009), for both siblings a variable representing attendance frequencies of religious services was included. The answer categories are measured on a 4-point scale: "never/hardly ever," "a few times a year," "a few times a month," and "a few times a week." Average attendance frequencies of religious services for both siblings was around 1.6. Appendix C shows a clear negative correlation of age with sibling support exchange and sibling contact, and a positive correlation of gender with sibling support exchange and sibling contact. Having more siblings is also negatively correlated with sibling support exchange and sibling contact. This implies that female respondents and respondents with more siblings on average reported more support exchange and contact with their sibling.

Plan of Analysis

To investigate—per relational dimension—the hypotheses about the sibling–parent–sibling triads, six relationships are available: the sibling relationship and the intergenerational relationships with each of the parents, reported by both siblings. The pairs of sibling relationships reported by both siblings, that is, sibling dyads, are treated as dependent outcomes, nested within families. Such data are multilevel or nested data, with the dyads at level 1 and the family at level 2, which can best be analyzed with a random effects or multilevel model (Voorpostel & Blieszner, 2008; see also Snijders & Bosker, 2012; Van Duijn, 2013). By including the intergenerational relationship and other individual (level 1) variables as well as family context variables (level 2) as explanatory variables in the model, their effects on the sibling relationships are estimated, while distinguishing variability between sibling–sibling relationships within families and variability between families.

For testing the three hypotheses, the main explanatory variables are the intergenerational relationships, that is, sibling–father and sibling–mother. By distinguishing the—correlated—two intergenerational relationships and including both in the same model, the relative strength of both intergenerational relationships on the mutual sibling relationship is investigated. The individual and family context variables are included in the model as well as control variables. Moreover, a variable indicating the primary respondent reporting the sibling relationship is included as control variable to account for the observed difference in sibling relationships, especially for support and conflict.

All independent continuous intergenerational support exchange and contact variables, as well as all geographical distance variables, parental conflict and age of both siblings are centered around the grand mean but not standardized. Centering is done to improve the interpretation of main effects in the interaction model (Afshartous & Preston, 2011). Moreover, positive (negative) values of the relationship variables indicate values above (below) average, that is, a stronger (weaker) relationship. This is helpful in interpreting their effects in relation to the research hypotheses, especially for the loyalty conflicts hypotheses requiring interaction effects.

For testing the enhancement and compensation hypotheses, intergenerational relationships with both parents are used as explanatory variables. The direction of the sibling relationship is distinguished by indicating the reporting sibling as ego, and the nonreporting sibling by alter. A positive effect of the intergenerational relationship reported by ego provides support for the enhancement hypothesis, whereas a negative effect is in line

with compensation. For testing the loyalty conflicts hypothesis, we need the intergenerational relationships reported by ego and alter, as well as the interaction between ego's and alter's reports on the intergenerational relationships with both parents. Dissimilar intergenerational relationships, that is, one relationship above the mean (positive), the other below (negative), lead to a negative value of the interaction variable. Evidence for the loyalty conflicts hypothesis requires a *positive* interaction effect on the sibling relationship. In addition, to evaluate the overall magnitude of loyalty conflicts, the estimate of the interaction variables have to be compared with the main effects of both intergenerational relationships.

Each of the models for the three relational dimensions, support exchange, contact, and conflict, were built in three steps, including the following (a) ego's reported intergenerational relationships and individual characteristics as well as the variable "is primary respondent" to control for differences between the primary and secondary respondent, (b) alter's reported intergenerational relationships and individual characteristics, as well as the family level (level 2) control variables, and (c) the interaction of ego's and alter's intergenerational relationship reports. Because the intergenerational relationships are highly correlated (see Appendix C for details), care is needed in the interpretation: Finding a small and therefore possibly nonsignificant effect might mean that a larger—possibly significant—effect in a similar analysis including only one of the intergenerational relationships is reduced by including the second intergenerational relationship due to multicollinearity. Where applicable, such effects are reported based on the separate intergenerational analyses that are available in Appendix E.

The multilevel analyses were performed by using Stata's XTREG MLE random effects model for the support exchange and contact models and Stata's XTLOGIT RE logistic multilevel model for the conflict models (StataCorp., 2015).

Results

The estimates of the key variables in the complete models are presented in Table 3. The table consists of three columns, one for each of the three relational outcomes, that is, support exchange, contact, and conflict. In Appendix D, the results of the full model including control variables and of the first two models can be found. Estimates for separate models including intergenerational relationships with either father or mother are available in the Appendix E, showing all three model steps.

Support Exchange

Table 3, first column, shows a positive and significant effect of ego–father support exchange on support exchange in the sibling relationship ($\beta = 0.17$). There is also a strong effect of ego–mother support exchange on sibling support exchange ($\beta = 0.30$). The effects of the alter–parent relationships are positive but smaller and not significant. The interactions of ego–parent relationship and alter–parent relationship are positive but not significant, where the interaction effect pertaining to the mother is relatively large. Thus, although the positive parameter estimates are in line with the loyalty conflicts hypothesis, where siblings’ dissimilar intergenerational relationship values, represented by a negative value for their interaction, reduce the sibling relationship, no clear support is found for this hypothesis. In the separate analyses with one intergenerational relationship, the interaction effect is larger and significant for the analysis with mothers. The positive main effects of ego–parent relationships contradict the compensation hypothesis, thus providing support for the enhancement hypothesis. They also show that the mother–child relationship has a stronger effect than the father–child relationship.

Contact

A weak positive and significant effect of ego–father contact ($\beta = 0.10$) and a medium strong effect of ego–mother contact ($\beta = 0.24$) are found (see Table 3). The effect of the alter–parent relationship is much smaller and only significant for the alter–mother relationship ($\beta = 0.16$). The variables referring to loyalty conflicts, that is, the interactions of ego–parent relationship and alter–parent relationship, are positive and for mothers also significant ($\beta = 0.12$). The positive effect is in line with the loyalty conflict hypothesis. The effect is modest, as the parameter estimate is small in comparison to the main effect. In the separate analysis, the interaction effect of the ego and alter intergenerational relationship with the father is also significant although smaller than the intergenerational relationship with the mother. The positive main effects of intergenerational relationships are in line with the enhancement hypothesis, with again a stronger effect for the mother–child relationship than for the father–child relationship.

Conflict

Finally, Table 3 shows that a conflict with either parent increases the probability of reporting a conflict in the sibling relationship considerably ($\beta = 1.27$ for ego–father and $\beta = 1.58$ for ego–mother). This is in line with the

Table 3. Multilevel Analyses of Support Exchange, Contact, and Conflict Between Siblings: Unstandardized Coefficients ($N = 549$ Sibling Dyads, $N = 1,098$ Siblings).

	Support exchange		Contact		Conflict	
	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	1.829***	0.038	4.198***	0.087	-3.334***	0.588
Relationship ego–father	0.173***	0.037	0.103**	0.034	1.273***	0.364
Relationship ego–mother	0.304***	0.035	0.238***	0.036	1.576***	0.378
Relationship alter–father	0.003	0.037	-0.011	0.034	0.124	0.398
Relationship alter–mother	0.064	0.035	0.164***	0.037	0.579	0.410
Relationship ego–father × alter–father	0.019	0.093	0.020	0.036	-0.457	0.637
Relationship ego–mother × alter–mother	0.124	0.082	0.116**	0.040	0.024	0.612

Note. SE = standard error. The estimates are controlled for siblings' age, gender, education, and religion, sister–sister composition, whether ego is the focal respondent, geographical distance (log) between ego–father, ego–mother, sibling–father, sibling–mother on the individual sibling level and for geographical distance (log) between siblings, parental divorce, parental conflict, and whether the respondents have more siblings on the family level.

* $p < .05$. ** $p < .01$. *** $p < .001$.

enforcement hypothesis. The interactions of intergenerational relationships, are negative but not significant for the relationship with the father and close to zero for the mother. In the separate analyses, both effects are negative and not significant. That the interaction is negative and smaller than both main effects implies that when both siblings report conflict in the intergenerational relationship, the probability of conflict in the sibling relationship is actually higher. In other words, for conflict the “all-negative” triad is more likely than a balanced triad where both siblings report conflict with their parent(s). Therefore, no support is found for the loyalty conflict hypothesis for conflict.

Covariates and Explained Variance

The coefficients of the control variables in all analyses confirm results from earlier research (for details, see Appendix D). Here, the main findings are reported. Sisters have stronger support exchange and contact but also more conflict (although the latter is not significant). Female respondents indicate lower contact with their brother than male respondents with

their brother or sister. Gender (composition) effects were stronger than the intergenerational relationship effects of both siblings on contact, but weaker than ego's intergenerational effect on support exchange.

Higher educated egos have slightly more support exchange with their sibling, whereas higher educated alters report more contact with their sibling. No evidence was found for differences in the three relationships due to siblings' religion. Egos living further away from their father have more contact with their sibling.

Siblings who live further away from each other have lower support exchange and contact. Support exchange was higher between siblings with divorced parents and the probability of conflict between siblings was smaller when they had more siblings. Parental conflict did not reduce support or contact or increase conflict.

The percentages of explained variance both at the dyad level (1) and at the family level (2), cf. Snijders and Bosker (2012), are slightly lower for the support exchange than for the contact relationships, 0.37 and 0.43 at level 1, and 0.46 and 0.56 at level 2, respectively. The explained variance of 26% for conflict was slightly lower.

Discussion and Conclusion

Combining a family systems approach with the principles of balance theory, this study derived hypotheses on enhancement, compensation, and loyalty conflicts in triadic configurations of two siblings and their parents. The hypotheses were tested for three relational dimensions: support exchange, contact, and conflict. Strong evidence was found for enhancement, especially for support exchange. Although both intergenerational relationships (father-child and mother-child) turn out to be important predictors for the sibling relationship, the relationship with mother is the most important predictor for sibling support exchange and contact, in line with the notion that kinkeeping is a predominantly female affair (Hagestad, 1986). Some indication was obtained for the effect of loyalty conflicts on sibling relationships but only for contact and not for support exchange and conflict. Thus, the results of this study substantiate interdependency between intergenerational and adult sibling relationships.

A loyalty conflict was defined as the discrepancy in siblings' intergenerational relationships and connected with balance theory by defining positive (stronger) and negative (weaker) relationship in terms of the difference with the (overall) mean, which induced a well interpretable interaction effect. To investigate the sensitivity of our findings to this choice in defining the loyalty conflict, an alternative specification by the

absolute difference between the siblings' intergenerational relationships was tested as well. The multilevel analyses led to quite similar parameter estimates and substantively equal conclusions (analyses available on request). Although we distinguished between siblings' gender composition and their intergenerational relationships with fathers and mothers, specific intergenerational gender combinations such as father–son or mother–daughter were not taken into account. Additional analyses (available on request) show that adding intergenerational gender combinations to the separate father and mother models also would lead to the same conclusions.

In addition to lack of statistical power due to most family relationships not showing conflict, a possible explanation for the difference in results for on the one hand support exchange and contact, and on the other hand conflict, may be derived from the operationalization of balance theory. Structural balance theory is expressed in terms of “positive” and “negative” relationships, which we translated into “stronger” and “weaker” family relationships, whereas conflict is more easily interpreted as a “negative” or “weaker” characterization of the family relationship. The reverse of no conflict is not the same as a strong relationship. In addition, the tendency toward the “all-negative” triad may be due to a confounding underlying family conflict style that affects all ties in the family. Moreover, in this study we performed separate analyses for each relational dimension, whereas family relationships are often simultaneously characterized by “positive” and “negative” dimensions, here support exchange and contact versus conflict, that are not mutually exclusive. The co-occurrence of positive and negative relational dimensions is also known as ambivalent relationships (Bengtson et al., 2002; de Bel, Snijders, & Widmer, 2019; Lüscher & Pillemer, 1998; Priester & Petty, 2001; Widmer, Girardin, & Ludwig, 2018).

Our results are in line with some previous research findings on enhancement (e.g., Derkman et al., 2011; Hank & Steinbach, 2018; Portner & Riggs, 2016, although the former and the latter are applicable to younger siblings). The compensation in support found in other studies (e.g., Hank & Steinbach, 2018; Milevsky, 2005; Voorpostel & Blieszner, 2008) was not replicated in our study. The strong result for contact found in our study is hard to compare with previous research into enhancement and compensation by not using the same relational dimension for the intergenerational as for the sibling relationship. Hank and Steinbach (2018), for example, found support for compensation by testing the cross-dimensional relationship associations of intergenerational conflict with adult sibling intimacy.

The results in Voorpostel and Blieszner (2008)'s study, using a larger sample from the same NKPS data set with a similar objective, methodological,

and statistical approach, shows enhancement in the support relationship. Their main interest however is in cross-dimensional relationship associations, where they find an indication of a compensation mechanism between intergenerational contact frequency and sibling support. Therefore, these results are not easily comparable to the results in the current study, which in accordance with balance theory studied compensation, as well as enhancement and loyalty conflict, *within* one relational dimension.

The sample used in this study suffered from selection bias, leading to a sample with respondents who are slightly though significantly older, better educated, and coming from more harmonious families (analyses available on request). Indeed, the results from our study indicate that sibling–parent–sibling configurations are most likely to resemble the “all-positive” situation, where support exchange and contact is high and conflict is low between all family members. Additional analyses (available on request) showed that applying weights including demographic adjustments for Sibling 1 and weights correcting for underrepresentation of Sibling 2 (as secondary respondents) having a poorer relationship with Sibling 1, did not substantially affect the regression effects.

Due to the cross-sectional character of the study, its findings cannot be interpreted causally nor can we make inferences about the effect of changes in the intergenerational relationship on the sibling relationship. Although our study was focused on the sibling relationship, it is reasonable to assume that the sibling relationship also affects the intergenerational relationship (Derkman et al., 2011). As balance theory could of course be applied from the perspective of the parent to either sibling, or to the parental relationship, it would be an interesting next step to investigate further associations within family triadic configurations. In the current data, adding parental reports would lower the sample size by 50% since only one parent was interviewed. In addition, the considerable nonresponse among parent alters would even further decrease sample size (Kalmijn & Liefbroer, 2011).

Analyzing family data with more information, either through a longitudinal design or by including more or larger family configurations seems a natural extension of the current study. By distinguishing more detailed triadic configurations (Rawlings & Friedkin, 2017), applying more elaborate multilevel models (cf. Gerlsma, Snijders, Van Duijn, & Emmelkamp, 1997) or social network analysis further insight can be obtained in the interdependence of—and association between—family relationships. Obtaining such data for a large and representative sample is obviously exceedingly complex.

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Note

1. Since conflict information was collected regardless of siblings' and parents' coresidence, 621 cases were available for conflict. The analyses (available on request) on the larger data set lead to similar results and conclusions.

Supplemental Material

Supplemental material for this article is available online.

References

- Afshartous, D., & Preston, R. (2011). Key result of interaction models with centering. *Journal of Statistics Education, 19*(3), 1-24. Retrieved from <http://www.amstat.org/publications/jse/v19n3/afshartous.pdf>
- Amato, P. R. (2000). The consequences of divorce for adults and children. *Journal of Marriage and the Family, 62*, 1269-1287. doi:10.1111/j.1741-3737.2000.01269.x
- Amato, P. R. (2010). Research on divorce: Continuing trends and new developments. *Journal of Marriage and Family, 72*, 650-666. doi:10.1111/j.1741-3737.2010.00723.x
- Amato, P. R. (2014). The consequences of divorce for adults and children: An update. *Društvena Istraživanja: Časopis Za Opća Društvena Pitanja, 23*(1), 5-24.
- Amato, P. R., & Afifi, T. D. (2006). Feeling caught between parents: Adult children's Relations with parents and subjective well-being. *Journal of Marriage and Family, 68*, 222-235. doi:10.1111/j.1741-3737.2006.00243.x
- Bedford, V., & Avioli, P. S. (2012). Sibling relationships from midlife to old age. In V. H. Blieszner & R. Bedford (Eds.), *Handbook of families and ageing* (2nd ed., pp. 125-151). Santa Barbara, CA: Praeger.
- Bengtson, V. L., Giarrusso, R., Mabry, J. B., & Silverstein, M. (2002). Solidarity, conflict, and ambivalence: Complementary or competing perspectives on inter-

- generational relationships? *Family Relations*, 64, 568-576. doi:10.1111/j.1741-3737.2002.00568.x
- Cartwright, D., & Harary, F. (1956). Structural balance: A generalization of Heider's theory. *Psychological Review*, 63, 277-293. doi:10.1037/h0046049
- Cicirelli, V. G. (1995). *Sibling Relationships across the Life Span*. Boston, MA: Springer.
- Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology*, 48, 243-267. doi:10.1146/annurev.psych.48.1.243
- de Bel, V., Snijders, T. A. B., & Widmer, E. D. (2019). *Ambivalent family triads*. Manuscript submitted for publication.
- de Leeuw, E., & de Heer, W. (2002). Trends in household survey nonresponse: A longitudinal and international comparison. In R. M. Groves, D. A. Dillman, J. L. Eltinge, & R. J. Little (Eds.), *Survey nonresponse* (pp. 41-54). New York, NY: Wiley.
- Derkman, M. M. S., Engels, R. C. M. E., Kuntsche, E., van der Vorst, H., & Scholte, R. H. J. (2011). Bidirectional associations between sibling relationships and parental support during adolescence. *Journal of Youth and Adolescence*, 40, 490-501. doi:10.1007/s10964-010-9576-8
- Dykstra, P. A., Kalmijn, M., Knijn, G. C. M., Komter, A. E., Liefbroer, A. C., & Mulder, C. H. (2005). *Codebook of the Netherlands Kinship Panel Study, a multi-actor, multi-method panel study on solidarity in family relationships, Wave 1* (NKPS Working Paper No.4). The Hague, Netherlands: Netherlands Interdisciplinary Demographic Institute.
- Eriksen, S., & Gerstel, N. (2002). A labor of love or labor itself: Care work among adult brothers and sisters. *Journal of Family Issues*, 23, 836-856. doi:10.1177/019251302236597
- Gans, D., Silverstein, M., & Lowenstein, A. (2009). Do religious children care more and provide more care for older parents? A study of filial norms and behaviors across five nations. *Journal of Comparative Family Studies*, 40, 187-201. doi:10.1111/obr.12065.
- Gerlsma, C., Snijders, T. A. B., Van Duijn, M. A. J., & Emmelkamp, P. M. G. (1997). Parenting and psychopathology: Differences in family members' perceptions of parental rearing styles. *Personality and Individual Differences*, 23, 271-282. doi:10.1016/S0191-8869(97)00033-0
- Hagestad, G. O. (1986). The family: Women and grandparents as kinkeepers. In A. Pifer & L. Bronte (Eds.), *Our aging society: Paradox and promise* (pp. 141-160). New York, NY: Norton.
- Hank, K., & Steinbach, A. (2018, June). Intergenerational solidarity and intragenerational relations between adult siblings. *Social Science Research*, 76, 55-64. doi:10.1016/j.ssresearch.2018.08.003
- Heider, F. (1946). Attitudes and cognitive organization. *Journal of Psychology*, 21, 107-112.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York, NY: John Wiley.

- Kalmijn, M. (2006). Educational inequality and family relationships: Influences on contact and proximity. *European Sociological Review*, 22, 1-16. doi:10.1093/esr/jci036
- Kalmijn, M., & Leopold, T. (2019). Changing sibling relationships after parents' death: The role of solidarity and kinkeeping. *Journal of Marriage and Family*, 81, 99-114. doi:10.1111/jomf.12509
- Kalmijn, M., & Liefbroer, A. C. (2011). Nonresponse of secondary respondents in multi-actor surveys: Determinants, consequences, and possible remedies. *Journal of Family Issues*, 32, 735-766. doi:10.1177/0192513X10390184
- Lüscher, K., & Pillemer, K. (1998). Intergenerational ambivalence: A new approach to the study of parent-child relations in later life. *Journal of Marriage and the Family*, 60, 413. doi:10.2307/353858
- Matthews, S. H. (2002). *Sisters and brothers/daughters and sons: Meeting the needs of old parents*. Bloomington, IN: Unlimited.
- Milevsky, A. (2005). Compensatory patterns of sibling support in emerging adulthood: Variations in loneliness, self-esteem, depression and life satisfaction. *Journal of Social and Personal Relationships*, 22, 743-755. doi:10.1177/0265407505056447
- Minuchin, S. (1974). *Families and family therapy*. Cambridge, MA: Harvard University Press.
- Mulder, C. H., & van der Meer, M. J. (2009). Geographical distances and support from family members. *Population, Space and Place*, 15, 381-399. doi:10.1002/psp.557
- Poortman, A.-R., & Voorpostel, M. (2009). Parental divorce and sibling relationships: A research note. *Journal of Family Issues*, 30, 74-91. doi:10.1177/0192513X08322782
- Portner, L. C., & Riggs, S. A. (2016). Sibling relationships in emerging adulthood: Associations with parent-child relationship. *Journal of Child and Family Studies*, 25, 1755-1764. doi:10.1007/s10826-015-0358-5
- Priester, J. R., & Petty, R. E. (2001). Extending the bases of subjective attitudinal ambivalence: Interpersonal and intrapersonal antecedents of evaluative tension. *Journal of Personality and Social Psychology*, 80, 19-34. doi:10.1037/0022-3514.80.1.19
- Rawlings, C. M., & Friedkin, N. E. (2017). The structural balance theory of sentiment networks: Elaboration and test. *American Journal of Sociology*, 123, 510-548. doi:10.1086/692757
- Riggio, H. R. (2001). Relations between parental divorce and the quality of adult sibling relationships. *Journal of Divorce & Remarriage*, 36, 67-82. doi:10.1300/J087v36n01
- Silverstein, M., Gans, D., Lowenstein, A., Giarrusso, R., & Bengtson, V. L. (2010). Older parent-child relationships in six developed nations: Comparisons at the intersection of affection and conflict. *Journal of Marriage and Family*, 72, 1006-1021. doi:10.1111/j.1741-3737.2010.00745.x
- Snijders, T. A. B., & Bosker, R. J. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modelling* (2nd ed.). London, England: Sage.

- Sobolewski, J. M., & Amato, P. R. (2007). Parents' discord and divorce, parent-child relationships and subjective well-being in early adulthood: Is feeling close to two parents always better than feeling close to one? *Social Forces*, *85*, 1105-1124. doi:10.1353/sof.2007.0056
- Spitze, G., & Trent, K. (2006). Gender differences in adult sibling relations in two-child families. *Journal of Marriage and Family*, *68*, 977-992.
- StataCorp. (2015). Stata [Statistical software]. College Station, TX: StataCorp LP.
- Van Duijn, M. A. J. (2013). Multilevel modeling of social network and relational data. In M. Scott, J. Simonoff, & B. Marx (Eds.), *The Sage handbook of multilevel modeling* (pp. 599-618). London, England: Sage.
- van Gaalen, R. I., Dykstra, P. A., & Flap, H. (2008). Intergenerational contact beyond the dyad: The role of the sibling network. *European Journal of Ageing*, *5*, 19-29. doi:10.1007/s10433-008-0076-6
- Voorpostel, M., & Blieszner, R. (2008). Intergenerational solidarity and support between adult siblings. *Journal of Marriage and Family*, *70*, 157-167.
- Voorpostel, M., Dykstra, P. A., & Flap, H. (2007). Similar or different? The importance of similarities and differences for support between siblings. *Journal of Family Issues*, *28*, 1026-1053. doi:10.1016/j.procs.2015.07.135
- Voorpostel, M., van der Lippe, T., & Flap, H. (2012). For better or worse: Negative life events and sibling relationships. *International Sociology*, *27*, 330-348. doi:10.1177/0268580911423051
- Waite, L. J., & Harrison, S. C. (1992). Keeping in touch: How women in mid-life allocate social contacts among Kith and Kin. *Social Forces*, *70*, 637-655. doi:10.2307/2579747
- Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications* (Vol. 8). Cambridge, England: Cambridge University Press.
- White, L. K., & Riedmann, A. (1992). Ties among adult siblings. *Social Forces*, *71*, 85-102. doi:10.1093/sf/71.1.85
- Whiteman, S. D., McHale, S. M., & Soli, A. (2011). Theoretical perspectives on sibling relationships. *Journal of Family Theory & Review*, *3*, 124-139. doi:10.1111/j.1756-2589.2011.00087.x
- Widmer, E. D., Girardin, M., & Ludwig, C. (2018). Conflict structures in family networks of older adults and their relationship with health-related quality of life. *Journal of Family Issues*, *39*, 1573-1597. doi:10.1177/0192513X17714507