


# Longitudinal associations between sibling relationship quality and child adjustment after divorce

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## Abstract

**Objective:** This study examined the interplay between the parent–child and sibling relationships in their associations with child adjustment after divorce, in order to understand the postdivorce impact of the sibling relationship more thoroughly.

**Background:** The sibling relationship is unique in its lifetime duration and frequent interactions, and is associated with child adjustment in intact families. Research on the sibling relationship in divorced families is warranted, as it is one of the few stable factors in children's lives shortly after divorce.

**Method:** To examine direct and moderating effects of the sibling relationship, data from  $N = 117$  children ( $M_{\text{age}} = 12.85$ ) of 65 families and their recently divorced parents (60 mothers, 45 fathers) were used. Longitudinal associations of sibling support, sibling conflict, parent–child relationship quality, and their interactions with child adjustment were estimated with generalized estimating equations.

**Results:** The sibling relationship was related to children's (relative change in) externalizing problems and self-esteem over time, but not to internalizing problems. Especially high sibling support was found beneficial and buffered the

**Abbreviations:** CBCL, Child Behavior Checklist; CBSK/A, Self-Perception Scale for Children/Adolescents; CBQ, Co-parenting Behavior Questionnaire; CFA, Confirmatory factor analysis; FDD, Family Dynamics after Divorce; FERB, Faculty Ethics Review Board; FSBS, Faculty of Behavioral Sciences; GEE, Generalized estimating equation; NRI, Network of Relationships Inventory; PMM, Predictive mean matching; SEM, Structural equation modeling; SES, Socio-economic status; YSR, Youth Self Report.

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adversity of sibling conflict regarding children's self-esteem. There was no substantial evidence that siblings moderated parent-child relationship quality.

**Conclusions:** In the context of divorce and adequate parent-child relationship quality, the sibling relationship seems to be *complementary* rather than *compensatory* to that of parents. Given the role of siblings in externalizing behaviors and self-esteem, potential benefits of targeting the sibling relationship in (preventive) interventions aimed at divorced families should be explored.

#### KEYWORDS

child well-being, divorce, family dynamics, parent-child relationships, siblings

## INTRODUCTION

Every day, many children and adolescents worldwide are confronted with the divorce or separation of their parents. On average, they have more difficulties in their psychosocial and behavioral functioning when compared to their peers from intact families (Amato, 2001; Størksen et al., 2006; Weaver & Schofield, 2015), but interindividual variability in postdivorce adjustment has been emphasized as well (Amato & Anthony, 2014; van der Wal et al., 2019). In fact, family functioning after divorce is considered more vital for explaining child adjustment than the divorce itself (Amato, 2010; Lansford, 2009). Although the mother-child relationship was long considered most important for children's functioning, the impact of fathers' involvement has increasingly been recognized, especially since the number of co-parenting arrangements keeps rising (Nielsen, 2011). Yet, whilst the body of literature on parent-child relationships grew over the past few decades, research on the potential role of siblings in postdivorce child adjustment remains scarce (Milevsky & Heerwagen, 2013; Raley & Sweeney, 2020; Shumaker et al., 2011).

The lack of research on sibling relationships in divorced families is striking, given its lifetime duration, the high frequency of interactions, and the shared experience of their parents' divorce (Bush & Ehrenberg, 2003). Moreover, studies with mostly intact families show that whereas more warmth and support from siblings is related to less internalizing and externalizing problems and higher self-esteem in children, higher levels of sibling conflict are linked to more problem behaviors (Buist et al., 2013; Milevsky & Levitt, 2005). These sibling effects are found above and beyond the impact of parenting behaviors and after accounting for initial adjustment (Garcia et al., 2000; Kim et al., 2007; Pike et al., 2005). Therefore, this study examined the impact of the sibling relationship quality on children's postdivorce internalizing and externalizing problems, and self-esteem. Moreover, the moderating role of sibling relationship quality in the associations between parent-child relationship quality and child adjustment after divorce was explored.

### The sibling relationship in divorced families

Often, the sibling relationship is one of the few stable factors in the lives of children whose parents are separated, and its quality seemingly differs from sibling relationships in intact families. Both quantitative and qualitative studies indicate that siblings in divorced families tend to have more supportive relationships (Kunz, 2001), but also experience more conflict (Abbey & Dallos, 2004; Noller et al., 2009). Yet, other studies have reported no differences in sibling support between divorced and intact families (Hetherington & Clingempeel, 1992), of which the latter could be due

to these families being divorced for nearly 4 years and over. In retrospect, siblings reported that they felt closer towards each other especially through the shared experience of the divorce and its related stressors (Abbey & Dallos, 2004). At the same time, driven by negative processes between parents that are often associated with divorce, siblings also fight with each other more often (Ahrns, 2007; Poortman & Voorpostel, 2009). A few person-centered studies found that although for a majority of siblings higher support goes together with lower conflict (i.e., harmonious relationship), a sizeable group has an affect-intense relationship in which high support is accompanied by high conflict (McGuire et al., 1996; Sheehan et al., 2004). High levels of conflict are especially harmful in the context of low sibling support, as children in such a conflictual sibling relationships have a higher risk for aggression than those who experience an affect-intense sibling relationship (Buist & Vermande, 2014). Although simply having a sibling and spending time with each other could already benefit children after divorce (Jacobs & Sillars, 2012; Kempton et al., 1991), little is known on the potential impact of sibling support and sibling conflict, as well as their interaction, on postdivorce child adjustment.

Small to moderate concurrent correlations between sibling relationship quality (i.e., based on negativity and positivity) and children's internalizing and externalizing problems in divorced families were reported (Deater-Deckard et al., 2002). Similarly, sibling negativity and positivity as separate constructs have been associated with children's externalizing problems in divorced families (Hetherington & Clingempeel, 1992; Kim et al., 1999). These findings fit with the idea of social learning through observing and imitating behaviors, attitudes, and emotional reactions of others (Bandura, 1973, 1977), in which the sibling relationship is considered a unique context for children to practice and learn behaviors that they can use in interaction with others (Feinberg et al., 2012; McHale et al., 2012). In contrast to previous work on intact families, a longitudinal study on divorced families did not show a link over time between sibling relationship quality and externalizing problems, which was likely due to high stability (i.e., autocorrelations) of externalizing problems (Hetherington & Clingempeel, 1992). As the majority of previous studies in the context of divorce relied on concurrent or retrospective data, there is a need for more longitudinal research on the potential impact of sibling relationship quality on child adjustment in recently divorced families specifically.

## The compensatory and exacerbating effect of sibling relationship quality

When children receive adequate support from parents and are able to transition to a satisfactory reorganized family system after divorce, sibling support is thought to be merely *complementary* to the support of parents (Jacobs & Sillars, 2012), directly affecting psychosocial adjustment. However, the sibling relationship quality may also serve as a source of protection and support in stressful circumstances (Feinberg et al., 2012). Reorganization of the parent-child relationships could form such postdivorce stressors, as parents tend to be less available and responsive to their children during the first years after divorce (Wallerstein et al., 2013), just at the time when they are most in need of parental support. Stressors of a recent divorce, such as conflict with the ex-spouse, financial struggles, and moving houses, may preoccupy parents and cause them to be less responsive to the emotional needs of their children, less communicative, and engaged in more conflicts with them. In a recent meta-analysis, parenting behaviors and parent-child relationship quality have been related to child adjustment after divorce (van Dijk et al., 2020). Although children have a basic need for parental love and support (Rohner, 1986), and parent-child conflict might result in children's distress and emotional insecurity (Cummings & Miller-Graff, 2015), a supportive and warm sibling relationship could partly compensate for low parent-child relationship quality.

This potential buffering effect of the sibling relationship is in line with a *compensatory* perspective (Jacobs & Sillars, 2012; Milevsky & Levitt, 2005) and fits with family systems theory in

which different subsystems are assumed to be dependent of each other (Cox & Paley, 1997, 2003). Drawing from the literature on intact families, modest compensatory effects of the sibling relationship have been documented for several stressors. Positive sibling ties buffered adversity of marital conflict (Davies et al., 2019; Deković & Buist, 2005), general negative life events (Gass et al., 2007), and poor parent–child relationship quality (Milevsky & Levitt, 2005). In addition to a source of protection, high conflict levels and low support within the sibling relationship could potentially *exacerbate* the impact of negative parent–child processes. Potential compensatory and exacerbating effects of the sibling relationship in divorced families have yet to be examined.

## Current study

This study examined the link between sibling relationship quality and child adjustment after a recent divorce. The focus on recently divorced families is informed by empirical findings that increases in sibling conflict after divorce tend to be short-termed (Bush & Ehrenberg, 2003), and diminished parent–child relationship quality is most likely to be apparent during and the first few years after the divorce (Wallerstein et al., 2013). It therefore seems most fruitful to examine sibling processes, and potential moderating effects of the sibling relationship, not too long after parents have separated. As research in mostly intact families has linked sibling relationship quality to internalizing and externalizing problems (Buist et al., 2013), and self-esteem (Milevsky & Levitt, 2005), and these outcomes are most consistently reported on as affected by parental divorce (Amato, 2001; van Dijk et al., 2020), they were chosen as outcomes in the present study. It is important to acknowledge that most of the studies, if reported, focused on European American, White, and/or ethnic majority samples (exceptions are Davies et al., 2019; Garcia et al., 2000; Milevsky & Levitt, 2005), as is congruent with the current study.

The first objective was to examine whether (1) sibling warmth and sibling conflict related to children's psychosocial adjustment in divorced families 1 year later, above and beyond parent–child relationship quality. Less sibling warmth and more sibling conflict were hypothesized to associate with more internalizing and externalizing problems, and lower self-esteem over time. Given the findings that both high levels of support and conflict are more common in sibling dyads of divorced families, this study also explored whether (2) these aspects of the sibling relationship interacted in their association with postdivorce child adjustment. We expected high levels of sibling conflict to have stronger negative outcomes in the context of low sibling support than those in the context of high sibling support. Furthermore, (3) we examined the interactions between parent–child and sibling relationship quality to identify potential moderating processes of family relationships. It was anticipated that sibling warmth would compensate, and sibling conflict would exacerbate low levels of parent–child relationship quality. Lastly, in addition to testing over time associations, these research questions were also examined for relative change in child adjustment (4), by accounting for initial child adjustment levels.

Although shared physical custody arrangements are more common nowadays (Nielsen, 2011), divorced fathers are still less likely to co-reside with a child than divorced mothers (Kalmijn, 2013a; Koster et al., 2021). Research shows that on average, parent–child relationship quality after divorce decreases and that this is especially true for the father–child relationship (Kalmijn, 2013b; Thuen et al., 2021), even for fathers who were highly involved before the divorce (Shapiro & Lambert, 1999). However, there are indications for considerable heterogeneity in this effect (Elam et al., 2019), which makes it plausible that father–child relationship quality would be differently related to child adjustment than mother–child relationship quality. Likewise, differences in moderation effects could become apparent. Given these possible differences, all research questions were examined separately for mother–child and father–child relationship quality.

## METHOD

The data used in this study are part of the longitudinal research project “Family Dynamics after Divorce” (FDD) and consist of three annual measurement waves in which data were gathered from 77 recently divorced families (i.e.,  $N = 135$  children) in the Netherlands during the years 2016–2020. The study was approved by the independent Faculty Ethics Review Board (FERB) of the Faculty of Social and Behavioral Sciences (FSBS) of Utrecht University (FETC16-056). This study used the annual data of Waves 2 and 3 (referred to as Time 1 (T1) and Time 2 (T2) in this study), as these waves contained information on the relevant aspects of the parent–child relation, sibling relationship (i.e., support and conflict), and child adjustment after divorce (i.e., internalizing and externalizing problems, and self-esteem).

## Participants

Of the original sample, 12 families were not part of this study sample. Of these families, five families ( $n = 10$  children) initially participated but could not be reached for T1 of this study, one family ( $n = 2$  children) dropped out after T1, and in six families ( $n = 6$  children), the child did not have a (half-)sibling. There were no significant mean differences in study variables at T1 for children that were included or excluded from the study ( $p$  values of Welch’s  $t$  tests ranged from  $p = .416$  to  $p = .958$ ), except for sibling conflict ( $t(116) = 5.71$ ,  $p < .000$ ), which was higher for the excluded children at T1 ( $M = 0.50$ ) compared to the study sample ( $M = -0.01$ ). The final sample for the current study consisted of  $N = 65$  predominantly White families, with information from  $n = 117$  children,  $n = 60$  mothers, and  $n = 45$  fathers at T1. In  $n = 42$  families, both parents participated; of  $n = 18$  families, only mother participated; of  $n = 3$  families, only father participated; and of  $n = 2$  families data from both parents was missing at T1. Some of the participating children were part of the same family: In 8 families 3 children participated; in 36 families, 2 children participated; and 21 families had one child participating. The average family size was 2.27 children per family. Of the participating children, 48.7% were first-borns, 41.9% were second-borns, and 9.4% were third-born children.

At T1, children were between 9 and 17 years old ( $M = 12.85$ ;  $SD = 2.27$ ), 59 children (50.4%) were boys, less than half (40.2%) of them went to primary school, and 59.8% went to secondary school. Almost all children (94.0%) were born in the Netherlands, and others were born in Morocco (0.9%), Surinam (0.9%), England (1.7%), Kenia (1.7%), and Slovakia (0.9%). Most children (60.7%) lived with both parents an equal amount of the time (i.e., 3–4 days/nights each), 37.6% reported living entirely or mostly with their mother (i.e., minimum of 5 days/nights), and 1.7% lived mostly with their father. The age difference of the sibling dyads ranged from 1 year to 11 years and 5 months ( $M = 2.77$ ;  $SD = 1.68$ ), and most were mixed sex dyads (50.4%) compared to sister dyads (26.4%) and brother dyads (23.0%). Descriptive statistics of children’s parents are depicted in Table 1.

## Procedure

Recruitment took place through advertisements on websites specifically aimed at divorced parents, in school newsletters, and in waiting rooms of general practitioners, divorce counselors, and mediators. Of the families in the current study sample, 68% responded to our request for participation in the school newsletter, 15% to an online advertisement, 12% were notified about the research project by someone they knew, and 5% were recruited by a mediator/divorce counselor. After families indicated their willingness to participate, they received further information about the study. Both parents gave active informed consent for the participation of their child(ren), even

**TABLE 1** Descriptive statistics of parents in the study sample

	Mothers ( <i>n</i> = 60)			Fathers ( <i>n</i> = 46)		
	<i>M</i> / %	<i>SD</i>	Range	<i>M</i> / %	<i>SD</i>	Range
Time since divorce T1	1.89	0.57	1.0–3.17	-	-	-
Parent age T1	44.17	5.89	30.8–54.1	45.71	6.29	33.9–59.2
Country of birth						
The Netherlands	95.0			97.8		
Other <sup>a</sup>	5.0			2.2		
Highest attained education						
Primary education	1.7			-		
High school <sup>b</sup>	11.7			17.8		
Vocational education	26.7			13.3		
College education	40.0			37.8		
University education	20.0			31.1		
Taxable monthly income						
<€1.250	13.8			-		
€1.250–€3.750	63.8			35.7		
>€3.750	22.4			64.3		
New partner T1	43.1			53.8		
New partner T2	53.1			60.9		

*Note:* Both the educational level and monthly income of mothers and fathers were higher than the national average (CBS, 2020, 2021).

<sup>a</sup>Mothers not born in the Netherlands were born in Turkey (1.7%), Germany (1.7%), and Czech Republic (1.7%). One father (2.2%) was born in England.

<sup>b</sup>High school educational level ranged from prevocational to pre-university level.

if only one of the parents was involved in the study. Children also gave their active written consent. Data were collected during annual home visits by the principal investigator of the project, research assistants, and graduate students of the Faculty of Social and Behavioral Sciences (FSBS) of Utrecht University, except for 10% of the T2 visits that were substituted with online meetings due to COVID-19 restrictions. There were no mean differences in outcomes at T2 based on the method of gathering data (i.e., online or home visits) nor its timing (i.e., before or during the COVID-19 restrictions). If both parents participated, one home visit was scheduled with each of the parents. During the home visits, privacy was guaranteed regarding the information participants provided. Children filled out the survey independently, but for the 9- to 10-year-olds, as well as for those with dyslexia or a reading disability, questions were read out loud. Each wave, children received €10 for their participation. Parents did not receive a compensation for their participation.

## Measures

### Internalizing and externalizing problems

Children reported on their internalizing and externalizing problems at T1 and T2 through the Youth Self-Report (YSR) and parents reported on their children's problems through the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). Cronbach's alpha for the internalizing scale (31 items YSR, 32 items CBCL) based on the different reporters and waves ranged from  $\alpha = .88$  to  $\alpha = .94$ . Cronbach's alpha for the externalizing scale (32 items YSR, 35 items CBCL) ranged from  $\alpha = .76$  to  $\alpha = .96$ . All answers were given on a 3-point Likert scale,

namely *Not true* (0), *Somewhat or sometimes true* (1), and *Very or often true* (2). Concerning the different reporters (i.e., child, mother, and father), the correlations for the outcomes at different timepoints ranged from  $r = .43$  to  $r = .56$  between child and mother report, from  $r = .20$  to  $r = .42$  between child and father report, and from  $r = .39$  to  $r = .55$  between mother and father report. These correspondence rates between different informants are not uncommon, as also shown by a meta-analysis on interrater discrepancies (De Los Reyes et al., 2015). We averaged the scores of the different reporters into a single score in order to obtain robust measures of children's internalizing and externalizing problems. Sensitivity analyses based on only child-reported problem behaviors can be found in the supporting information (Data S1).

## Self-esteem

Children's self-esteem was measured using the subscale "global self-worth" (5 items) of the Self-Perception Scale for Children/Adolescents (CBSK/A; Treffers et al., 2004; Veerman et al., 1997). Example items were: "I am quite happy with myself" and "Often I am disappointed in myself." Answers were given on a 5-point Likert scale, ranging from *Not true at all* (1) to *Completely true* (5). Cronbach's alpha was  $\alpha = .80$  at T1 and  $\alpha = .81$  at T2.

## Mother-child and father-child relationship quality

Children reported on parent-child relationship quality with the "negative interaction" subscale (6 items) of the short version of the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985, 1992) and two subscales of the Co-parenting Behavior Questionnaire (CBQ; Schum & Stolberg, 2007): "parental warmth" (7 items) and "parent-child communication" (6 items). Example items were: "How much do you and your mother/father get upset with or mad at each other?" (negative interaction), "My mother/father says she/he loves me and gives me hugs" (warmth), and "My mother/father and I have friendly talks" (communication). A 5-point Likert scale was used, ranging from *Strongly disagree* (1) to *Strongly agree* (5) for "warmth" and "communication," and from *Hardly* (1) to *Extremely much* (5) for "negative interaction." Cronbach's alpha ranged from  $\alpha = .78$  to  $\alpha = .91$ .

## Sibling relationship: Support and conflict

When children reported on multiple sibling relationships, the relationship with the biological (half-)sibling they chose to report on first was used. This resulted in 65.0% dyadic relations (i.e., the same sibling relationship was reported on by both siblings) and 35.0% unilateral sibling reports. Within the dyadic relations, both sibling support ( $r = .69$ ) and sibling conflict ( $r = .55$ ) were highly correlated. In 49.6% of the cases, children reported on a younger sibling, and 50.4% of the children reported on their relationship with an older sibling. Children reported on the levels of sibling support and conflict with the "support" (8 items) and the "negative interaction" (6 items) scales of the NRI short version (Furman & Buhrmester, 1985, 1992). Example items were: "How much do you really care about your sibling?" (support) and "Do you and your sibling get on each other's nerves?" (negative interaction). Answers were given on a 5-point Likert scale, ranging from *Hardly* (1) to *Extremely much* (5). Cronbach's alpha was  $\alpha = .87$  for support and  $\alpha = .93$  for conflict.

Sister dyads scored significantly higher on sibling support when compared to brother dyads ( $\Delta M = 0.65$ ,  $p = .004$ ) and mixed sex dyads ( $\Delta M = 0.48$ ,  $p = .011$ ),  $F(2,110) = 6.37$ ,  $p = .002$ ). Also, the sister dyads scored higher on internalizing problems when compared to the brother dyads ( $\Delta M = 0.16$ ,  $p = .032$ ,  $F(2,110) = 3.27$ ,  $p = .042$ ). Lastly, the bigger the age difference

between siblings, the less sibling conflict was reported ( $r = -.25, p = .008$ ). Although these characteristics of the sibling relationship warrant attention, preferably as moderators, this was beyond the scope of the current study aims and also not possible to examine due to the small sample size. Age difference between siblings was not associated with any of the outcomes, and sister dyads scoring higher on internalizing problems when compared to the brother dyads can be explained by girls in general scoring higher on internalizing problems. Hence, this will be accounted for by including sex as a covariate.

## Analyses

Before the main analyses, confirmatory factor analyses (CFAs) for all predictors and self-esteem at T1 and T2 were conducted through structural equation modeling (SEM), as factor scores are preferred over the use of scaling scores (e.g., mean- or sum scores; McNeish & Wolf, 2020). Because the required number of parameter estimates in the CFAs for combining information from the YSR/CBCL of multiple reporters was beyond the scope of the current sample size, averaged scores were used for internalizing and externalizing problems at T1 and T2. This was deemed appropriate, as the YSR/CBCL scales have been widely used and extensively validated in prior research (De Wolff et al., 2014; Ebesutani et al., 2011; Lambert et al., 2007). For the CFAs, the diagonally weighted least squares (DWLS) estimator was used, as it provides less biased factor loadings for Likert-type data when compared to a (robust) maximum-likelihood estimator (ML or MLR; Li, 2016). The fit statistics and factor loadings of the CFAs are depicted in Table 2. The individual factor scores of the latent measurement models were then saved for subsequent analyses. Table 3 contains the correlations between the study variables, together with the means and standard deviations based on the mean scale scores of the variables (i.e., as computing factor scores involves centering and will return a mean of zero).

To examine the links between parent–child relationship quality, sibling support and conflict, and postdivorce child adjustment, multiple generalized estimating equations (GEEs) were performed. This approach was the most appropriate because in some cases, multiple children from the same family were included, violating the assumption of independence of the data. Because the sample involved small and unbalanced clusters (i.e., one to three children per family), GEEs

**TABLE 2** Fit statistics and factor loadings of the CFAs for the different study variables

	$\chi^2$ (df)	<i>p</i>	CFI	RMSEA	SRMR	Factor loadings
Self-esteem T1	1.61 (5)	.900	1.000	0.000	0.038	[0.50–0.88]
Self-esteem T2	1.10 (5)	.954	1.000	0.000	0.034	[0.43–0.82]
MC relationship quality T1	74.71 (150)	1.000	1.000	0.000	0.072	[0.50–1.00]
Negative interact. [R]						[0.50–0.90]
Warmth <sup>a</sup>						[0.57–0.77]
Communication						[0.37–0.76]
FC relationship quality T1	46.28 (150)	1.000	1.000	0.000	0.061	[0.39–1.00]
Negative interact. [R]						[0.64–0.98]
Warmth						[0.70–0.91]
Communication <sup>a</sup>						[0.55–0.92]
Sibling support T1	20.53 (20)	.425	1.000	0.015	0.082	[0.53–0.77]
Sibling conflict T1	3.66 (9)	.932	0.999	0.000	0.045	[0.71–0.87]

Note: A DWLS-estimator was used for all CFAs. Negative interact. = Negative interaction.

<sup>a</sup>In case of a very small (negative) variance, it was set to 0 to avoid estimation problems.



**TABLE 3** Correlations and descriptive statistics of the study variables ( $N = 117$ )

	1	2	3	4	5	6	7	8	9	10
1. Mother-child RQ T1	-									
2. Father-child RQ T1	.52***	-								
3. Sibling support T1	.39***	.12	-							
4. Sibling conflict T1	-.24*	-.24**	-.56***	-						
5. Internalizing T1	-.09	-.29**	.05	.12	-					
6. Externalizing T1	-.30***	-.24**	-.12	.32***	.55***	-				
7. Self-esteem T1	.20*	.26**	-.05	-.07	-.50***	-.21*	-			
8. Internalizing T2	-.21*	-.29**	-.06	.16	.72***	.45***	-.45***	-		
9. Externalizing T2	-.30**	-.16	-.30**	.32***	.28**	.64***	-.10	.57***	-	
10. Self-esteem T2	.18	.25**	.00	-.14	-.34***	-.18	.50***	-.64***	-.30**	-
<i>M</i>	4.20	4.03	3.54	2.44	0.29	0.17	4.18	0.28	0.17	4.09
<i>SD</i>	0.49	0.68	0.76	0.96	0.21	0.12	0.82	0.24	0.16	0.87

*Note:* For the correlations, internalizing and externalizing problems at T1 and T2 were based on the average mean scores of the multiple informants (i.e., child, mother, and father), the factor scores of the CFAs were used for the predictors at T1 and T2. The means and standard deviations are based on mean scores for all variables. Correlations with self-esteem T2 were based on  $N = 115$ .

Abbreviation: RQ, relationship quality.

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

were preferred over the use of multilevel models, as the latter are likely to overestimate the variance at the family level (McNeish, 2014). As our goal was to account within-family dependency, rather than explain variance at the different levels, this approach suited the research questions best. GEEs make no assumptions regarding the (normal) distribution of the random effects, and the dependency within clusters is treated as nuisance (Ballinger, 2004; McNeish et al., 2017). There are several ways to model the dependency due to clusters in GEE models, also referred to as “correlation working structure.” For each model, the best fitting structure (i.e., either “unstructured” or “exchangeable,” or “autoregressive” for models including initial adjustment measures) was selected, based on the smallest value of the quasi-likelihood, correlation information criterion (CIC; Hin & Wang, 2009; McNeish et al., 2017). Because GEE requires data without missing information, we performed multiple imputation using predictive mean matching (PMM) to impute child-reported parent–child negativity measures for six children of three different families (i.e., based on 100 imputed datasets).

We tested separate GEEs for different child outcomes (i.e., internalizing problems, externalizing problems, and self-esteem), as well as for mother–child relationship quality and father–child relationship quality separately. Both sibling support and sibling conflict were examined simultaneously in their association with each outcome 1 year later. The GEEs were performed in a stepwise manner. First, we entered the covariates age, sex, and birth order of the child, time since the (physical) divorce of parents, and (co-)residence arrangements in the models. The significant covariates were maintained in the subsequent steps and models, whereas nonsignificant covariates were omitted. Second, the main effects of sibling support, sibling conflict, and parent–child relationship quality were simultaneously added to the model. Third, moderating effects were examined by entering the interaction terms one-by-one (i.e., sibling conflict \* sibling support; sibling support \* parent–child relationship quality; sibling conflict \* parent–child relationship quality). Fourth, we repeated the second and third step of the analyses, but this time accounting for initial problem behaviors and self-esteem to measure relative change in child adjustment. Analyses were performed in the statistical software program “R” (version 3.6.3; R Core Team, 2020), using the “Lavaan”-package (Rosseel, 2012) for the CFAs, and the “Geepack”-package (Højsgaard et al., 2005) for the GEEs. Significant interaction terms were inspected by calculating the regions of significance (Johnson–Neyman method; Johnson & Fay, 1950), using the “jtools” package (Long, 2021).

## RESULTS

### **GEEs: Effects of family factors on internalizing problems**

The results of the different GEE models for internalizing problems are shown in Table 4. Girls showed higher levels of internalizing problems compared to boys. Also, a longer time since the divorce was related to more internalizing problems at T2. Both lower mother–child and father–child relationship quality at T1 were significantly associated with more internalizing problems at T2, whereas none of the sibling measures nor the interaction terms were related to internalizing problems 1 year later. In addition, lower mother–child relationship quality was significantly related to a relative increase in internalizing problems over time (i.e., when accounting for initial internalizing problems), but father–child relationship quality was not. None of the other factors or interaction terms significantly predicted relative change in internalizing problems.

### **GEEs: Effects of family factors on externalizing problems**

The parameter estimates of the different models for externalizing problems are depicted in Table 5. Regarding the covariates, a longer time since the divorce was associated with

**TABLE 4** Internalizing problems: GEE parameter estimates for parent–child relationship quality, sibling support, sibling conflict, and their interactions terms (*N* = 117)

	<i>B</i>	<i>SE B</i>	$\beta$	Wald	<i>p</i>	<i>R</i> <sup>2</sup>
1. Model 1: Covariates						
Age	0.00	0.01	.04	0.18	.674	.12
Sex	<b>0.09</b>	0.03	<b>.19</b>	<b>6.57</b>	<b>.010</b>	
Time since divorce	<b>0.08</b>	0.04	<b>.20</b>	<b>4.11</b>	<b>.043</b>	
Birth order	−0.02	0.03	−.06	0.80	.372	
(Co-)residence	−0.04	0.04	−.11	1.06	.302	
2. Model 1 + main effects						
Sex	<b>0.12/0.11</b>	0.04/0.03	<b>.26/.23</b>	<b>12.1/12.8</b>	<b>.000/0.000</b>	.18/.17
Time since divorce	0.07/0.07	0.04/0.04	.19/.17	3.81/2.60	.051/.107	
PC RQ T1	<b>−0.13/−0.26</b>	0.05/0.09	<b>−.22/−.31</b>	<b>6.62/8.74</b>	<b>.010/0.003</b>	
Sib support T1	0.01/−0.00	0.03/0.03	.03/−.00	0.07/0.00	.793/.956	
Sib conflict T1	0.04/0.03	0.02/0.02	.15/.12	2.58/1.55	.108/.213	
3. Model 2 + interactions						
Sib sup * Sib con	−0.04/−0.03	0.03/0.03	−.13/−.10	1.42/1.14	.233/.286	.20/.18
PC RQ * Sib sup	0.01/−0.06	0.05/0.08	.02/−.05	0.09/0.51	.767/.474	.18/.17
PC RQ * Sib con	0.00/0.15	0.05/0.10	.01/.15	0.01/2.11	.916/.066	.18/.20
4. Model 2 + stability						
Sex	0.03/0.03	0.03/0.03	.07/.06	1.00/0.87	.320/.350	.56/.54
Time since divorce	0.04/0.04	0.03/0.03	.10/.10	1.94/1.63	.160/.200	
PC RQ T1	<b>−0.08/−0.09</b>	0.04/0.07	<b>−.13/−.11</b>	<b>4.20/1.79</b>	<b>.040/.180</b>	
Sib support T1	−0.01/−0.01	0.02/0.02	−.02/−.05	0.11/0.39	.740/.530	
Sib conflict T1	0.02/0.01	0.02/0.02	.06/.05	0.44/0.22	.510/.640	
Internalizing T1	<b>0.72/0.69</b>	0.09/0.09	<b>.64/.63</b>	<b>66.0/63.0</b>	<b>.000/0.000</b>	
5. Model 4 + interactions						
Sib sup * Sib con	−0.03/−0.02	0.03/0.03	−.09/−.08	1.03/0.80	.310/.370	.57/.55
PC RQ * Sib sup	0.03/0.00	0.03/0.05	.05/.00	0.78/0.01	.380/.920	.56/.54
PC RQ * Sib con	−0.03/0.09	0.04/0.06	−.05/.11	0.41/2.64	.524/.100	.56/.55

Notes: Parameter estimates displayed in bold were significant at *p* < .05; those before the slash are for the mother–child models, and estimates after the slash for the father–child models. Based on the smallest CIC values, in 65% of the models, the “exchangeable” structure was used, in 29% “unstructured” was preferred, and in 6% of the models, the “autoregressive” structure was chosen. For sex: 0 = boys; 1 = girls.

Abbreviations: PC RQ, parent–child relationship quality; Sib con, sibling conflict; Sib sup, sibling support.

higher levels of externalizing problems, but the other covariates were not. In both the mother–child and father–child model, more sibling conflict was significantly related to more externalizing problems at T2. Higher mother–child relationship quality was related to less externalizing problems, but father–child relationship quality was not. None of the interaction terms were significant. When controlling for T1 externalizing problems, the association between sibling conflict and externalizing problems was no longer significant. Yet, higher levels of sibling support did directly relate to a relative decrease in externalizing problems in both the mother–child and father–child model. Again, none of the interaction terms was significant.

**TABLE 5** Externalizing problems: GEE parameter estimates for parent–child relationship quality, sibling support, sibling conflict, and their interactions terms ( $N = 117$ )

	<i>B</i>	<i>SE B</i>	$\beta$	Wald	<i>p</i>	<i>R</i> <sup>2</sup>
1. Model 1: Covariates						
Age	−0.01	0.01	−.10	0.82	.360	.05
Sex	−0.04	0.03	−.12	1.54	.210	
Time since divorce	<b>0.04</b>	0.02	<b>.16</b>	<b>4.20</b>	<b>.040</b>	
Birth order	−0.02	0.02	−.08	0.68	.410	
(Co-)residence	−0.02	0.02	−.07	0.70	.400	
2. Model 1 + main effects						
Time since divorce	<b>0.05/0.05</b>	0.02/0.02	<b>.18/.20</b>	<b>7.37/7.76</b>	<b>.007/.005</b>	.19/.16
PC RQ T1	−0.07/−0.03	0.04/0.05	−.18/−.06	3.59/0.48	.058/.487	
Sib support T1	−0.03/−.04	0.02/0.02	−.14/−.21	1.43/3.81	.231/.051	
Sib conflict T1	<b>0.04/0.04</b>	0.02/0.02	<b>.22/.21</b>	<b>4.84/3.98</b>	<b>.028/.046</b>	
3. Model 2 + interactions						
Sib sup * Sib con	−0.05/−0.05	0.03/0.03	−.23/−.21	2.89/2.36	.089/.125	.24/.20
PC RQ * Sib sup	−0.02/−0.01	0.04/0.07	−.04/−.02	0.14/0.04	.713/.847	.19/.16
PC RQ * Sib con	−0.01/0.05	0.05/0.04	−.01/.08	0.02/1.41	.897/.235	.19/.17
4. Model 2 + stability						
Time since divorce	<b>0.04/0.04</b>	0.01/0.01	<b>.14/.16</b>	<b>7.63/8.67</b>	<b>.006/.003</b>	.48/.49
PC RQ T1	−0.00/0.01	0.03/0.03	−.01/.05	0.01/0.77	.922/.380	
Sib support T1	<b>−0.04/−0.05</b>	0.02/0.02	<b>−.25/−.26</b>	<b>8.09/11.7</b>	<b>.004/.001</b>	
Sib conflict T1	−0.00/0.00	0.01/0.01	−.00/.01	0.00/0.01	.993/.909	
Externalizing T1	<b>0.81/0.84</b>	0.12/0.12	<b>.60/.61</b>	<b>45.9/47.5</b>	<b>.000/.000</b>	
5. Model 4 + interactions						
Sib sup * Sib con	−0.02/−0.02	0.03/0.03	−.11/−.10	0.69/0.56	.406/.456	.49/.49
PC RQ * Sib sup	0.03/0.02	0.04/0.05	.07/.02	0.63/0.13	.427/.723	.49/.49
PC RQ * Sib con	−0.02/0.04	0.04/0.02	−.05/.07	0.31/3.03	.577/.082	.49/.49

*Note:* Parameter estimates displayed in bold were significant at  $p < .05$ ; those before the slash are for the mother–child models, and estimates after the slash for the father–child models. Based on the smallest CIC values, in 53% of the models, “unstructured” was used, and for the other models, the “exchangeable” structure was preferred. For sex: 0 = boys, 1 = girls. Abbreviations: PC RQ, parent–child relationship quality; Sib con, sibling conflict; Sib sup, sibling support.

## GEEs: Effects of family factors on self-esteem

The results for self-esteem are shown in Table 6. Girls were more likely to have a lower level of self-esteem at T2. Because children’s age trended towards significance (i.e., older children had lower self-esteem levels), this covariate was also included in subsequent models. The other covariates were not related to children’s self-esteem and therefore omitted from further analyses. With regard to the family factors, higher levels of mother–child relationship quality, but not father–child relationship quality, were related to higher self-esteem levels. More sibling conflict was also related to lower levels of self-esteem at T2 in the mother–child model, and this effect was qualified by levels of sibling support in both the mother–child and father–child model, as indicated by the significant interaction terms. More sibling conflict was related to lower self-esteem at T2 only when sibling support was low (below  $-0.1$  SD, see Figure 1), but not when sibling support was medium to high. The regions of significance indicated that this was true for relatively high levels of sibling conflict (above  $+1.5$  SD; see the vertical line on the

**TABLE 6** Self-esteem: GEE parameter estimates for parent–child relationship quality, sibling support, sibling conflict, and their interactions terms ( $N = 115$ )

	<i>B</i>	<i>SE B</i>	$\beta$	Wald	<i>p</i>	<i>R</i> <sup>2</sup>
1. Model 1: Covariates						
Age	−0.07	0.04	−.18	3.44	.064	.11
Sex	<b>−0.40</b>	0.15	<b>−.24</b>	<b>6.80</b>	<b>.009</b>	
Time since divorce	0.13	0.13	.09	0.98	.321	
Birth order	0.02	0.10	.02	0.04	.834	
(Co-)residence	0.09	0.13	.07	0.48	.488	
2. Model 1 + main effects						
Age <sup>a</sup>	<b>−0.06/−0.06</b>	0.03/0.03	<b>−.17/−.16</b>	<b>3.85/3.59</b>	<b>.049/.058</b>	.16/.16
Sex	<b>−0.47/−0.42</b>	0.17/0.16	<b>−.28/−.25</b>	<b>7.39/6.98</b>	<b>.007/.008</b>	
PC RQ T1	<b>0.39/0.57</b>	0.19/0.35	<b>.19/.19</b>	<b>4.03/2.65</b>	<b>.045/.103</b>	
Sib support T1	−0.06/0.00	0.11/0.11	−.06/.00	0.31/0.00	.577/.973	
Sib conflict T1	<b>−0.15/−0.12</b>	0.07/0.08	<b>−.17/−.14</b>	<b>4.03/2.04</b>	<b>.045/.154</b>	
3. Model 2 + interactions						
Sib sup * Sib con	<b>0.29/0.30</b>	0.12/0.12	<b>.27/.27</b>	<b>6.22/5.90</b>	<b>.013/.015</b>	.22/.22
PC RQ * Sib sup	−0.12/0.17	0.13/0.32	−.05/.05	0.82/0.28	.365/.594	.16/.16
PC RQ * Sib con	0.12/−0.45	0.16/0.25	.05/−.14	0.54/3.22	.462/.073	.16/.18
4. Model 2 + stability						
Age	−0.03/−0.03	0.03/0.03	−.08/−.08	1.30/1.23	.255/.270	.29/.29
Sex	−0.28/−0.25	0.17/0.16	−.16/−.15	2.61/2.51	.106/.110	
PC RQ T1	0.21/0.31	0.19/0.32	.10/.10	1.23/0.91	.267/.340	
Sib support T1	−0.06/−0.03	0.11/0.11	−.05/−.02	0.32/0.06	.575/.800	
Sib conflict T1	−0.12/−0.11	0.07/0.08	−.14/−.12	2.97/1.98	.085/.160	
Self-esteem T1	<b>0.46/0.46</b>	0.12/0.12	<b>.39/.38</b>	<b>15.5/15.6</b>	<b>.000/.000</b>	
5. Model 4 + interactions						
Sib sup * Sib con	<b>0.29/0.29</b>	0.12/0.12	<b>.26/.26</b>	<b>5.70/5.35</b>	<b>.017/.021</b>	.36/.36
PC RQ * Sib sup	<b>−0.28/0.11</b>	0.12/0.33	<b>−.12/.03</b>	4.99/0.10	<b>.026/.750</b>	.31/.29
PC RQ * Sib con	0.26/−0.23	0.17/0.27	.12/−.07	2.33/0.69	.127/.406	.31/.30

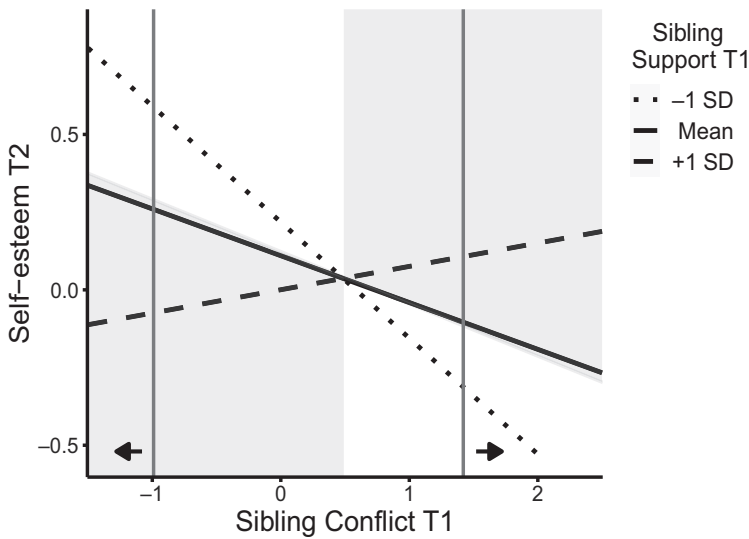
Note: Parameter estimates displayed in bold were significant at  $p < .05$ ; those before the slash are for the mother–child models, and estimates after the slash for the father–child models. Based on the smallest CIC values, in 71% of the models, the “exchangeable” structure was used, for 18% of the models, “unstructured” was preferred, and for 12% of the (autoregressive) models, the “autoregressive” structure had the best fit. For sex: 0 = boys; 1 = girls.

Abbreviations: PC RQ, parent–child relationship quality; Sib con, sibling conflict; Sib sup, sibling support.

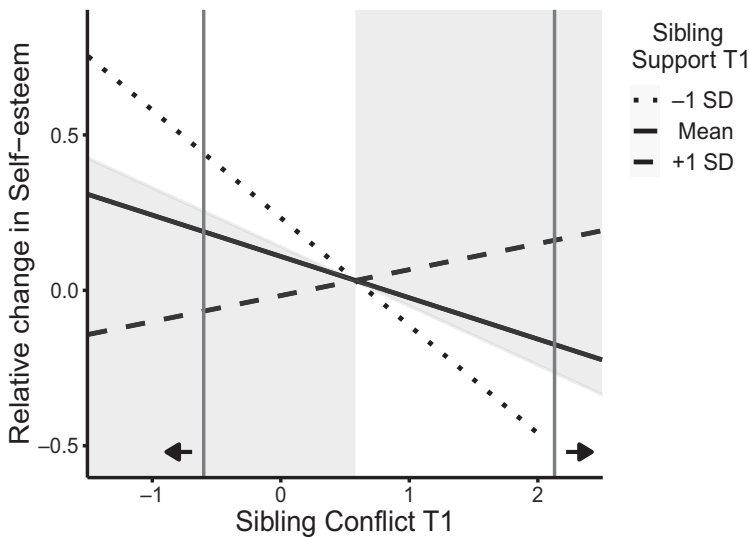
<sup>a</sup>Because age trended towards significance, this covariate was included in subsequent models.

right). In case of low sibling conflict (below  $-1.0$  SD; see the vertical line on the left), low sibling support was associated with more self-esteem at T2 as compared to medium to high levels of support. The interaction explained an additional 6% of variance in self-esteem.

Similar patterns were found for relative change in self-esteem in both models. As shown in Figure 2, more sibling conflict was related to relative change in self-esteem when sibling support was below  $-0.3$  SD (i.e., white region), but not in case of medium to high levels of sibling support. The interaction was significant for low (below  $-0.6$  SD) and high (above  $+2.2$  SD) levels of sibling conflict, and accounted for an additional 7% of explained variance in relative change in children’s self-esteem. Lastly, the estimates suggested that lower mother–child relationship quality related to a relative decrease in self-esteem when sibling support was low as well (below



**FIGURE 1** Plotted interaction of “sibling support \* sibling conflict” on levels of self-esteem at T2



**FIGURE 2** Plotted interaction of “sibling support \* sibling conflict” on relative change in self-esteem

–0.6 SD), but not for medium to high sibling support. However, the region of significance was outside the interval  $[-3.21, 0.79]$ , whereas the actual range of mother–child relationship quality was  $[-1.45, 0.52]$ .

## DISCUSSION

During and after parental divorce—often marked as a period of instability and uncertainty—the sibling relationship is one of the few stable factors in the lives of children. More knowledge on the role of the sibling relationship in children’s postdivorce adjustment can contribute to

guidelines for practitioners working with divorced families. Therefore, the current study examined the interplay of the sibling and parent–child relationships in their associations with child adjustment after divorce. Overall, after accounting for parent–child relationship quality, the sibling relationship was related to children’s externalizing problems and self-esteem 1 year later, as well as to relative change in these adjustment domains, but not to internalizing problems. Hardly any evidence was found for compensating or exacerbating effects of the sibling relationship on the associations between the mother–child and father–child relationships and postdivorce child adjustment. Additionally, mother–child relationship quality had more impact in terms of statistical significance when compared to father–child relationship quality, despite the fact that almost two thirds of the sample stayed at their mothers’ and fathers’ home an equal amount of the time. Yet, of the remaining third of the sample, most children lived mostly or only with their mother, which could partly account for the findings that the mother–child relationship was more often found to be significantly associated with postdivorce child adjustment when compared to father–child relationship quality. It should be noted that these alleged differences are merely based on comparing the patterns of significance, rather than explicitly testing for statistical differences between mothers and fathers. Moreover, the differences in explained variance of the mother–child versus father–child models were relatively small.

## **Associations between family factors and psychosocial adjustment over time**

### **Parent–child relationship quality and sibling support and conflict**

First, the study examined if sibling support and sibling conflict were related to children’s over time internalizing and externalizing problems, and self-esteem above and beyond the parent–child relationship quality in divorced families. The results showed no significant association between internalizing problems and either sibling conflict or sibling support, whereas higher levels of both mother–child and father–child relationship quality were related to less internalizing problems 1 year later. Although this is in contrast with previous work on the sibling relationship and internalizing problems (Buist et al., 2013; Deater-Deckard et al., 2002), it fits with the conclusion that, based on retrospective reports of adults, only companionship or time spent with a sibling benefited their personal adjustment as opposed to emotional, informational, or instrumental support (Jacobs & Sillars, 2012). Another recent study did not find a longitudinal association between sibling support or conflict and children’s depressive symptoms in predominantly intact families either (Buist et al., 2019).

In addition, the results indicated that more sibling conflict was related to more externalizing problems and lower levels of self-esteem 1 year later, above and beyond the parent–child relationship quality. For self-esteem, only mother–child relationship quality was significantly related to children’s self-esteem 1 year later, whereas father–child relationship quality was not. The negative association between sibling conflict and self-esteem was only evident when sibling support was relatively low and sibling conflict was high (conflictual relationship), and in cases when both sibling support and conflict were low (disengaged relation). This suggests that in affect-intense sibling relationships, high sibling support alleviates or buffers the adversity of high sibling conflict regarding their self-esteem. This interplay between the different aspects of a sibling relationship is particularly relevant in the context of divorce, where siblings tend to have more supportive relationships (Kunz, 2001), but also experience more conflict (Abbey & Dallos, 2004; Noller et al., 2009), and emphasizes the importance of both aspects—as well as their dependency—in explaining postdivorce child adjustment.

The contrasting findings on the role of the sibling relationship for internalizing versus externalizing problems seem to suggest that in case of diminished parent–child relationship quality after divorce, children tend to express their distress inwards. In a conflictual sibling relationship

with a lack of support, children rather display their distress outwards. It may well be that the parent–child context and the degree to which children feel unconditionally loved by both their parents is specifically vital in preventing internalizing behaviors, whereas the sibling relationship offers a context for children to practice and learn behaviors that they can use in interaction with others (Feinberg et al., 2012; McHale et al., 2012), which is in line with the premises of social learning theory (Bandura, 1973, 1977). Hence, in case of a conflictual sibling relationship, aggressive behaviors are likely to transfer into other contexts, whereas high sibling support offers children the opportunity to observe, imitate, and practice more positive skills as well. Another explanation might be that some children are predisposed for more aggression in general, both in the sibling relationship and in other contexts (Stormshak et al., 1996). Future studies could benefit from examining the bidirectionality of effects between sibling conflict and aggression in other domains (Feinberg et al., 2012). The same goes for other aspects of the sibling relationship, internalizing problems, and self-esteem of children from divorced families.

With regard to self-esteem, both mother–child and sibling relationship quality were related to children’s postdivorce self-esteem. As self-esteem was the least stable outcome over time, this is particularly important given its relevance for children’s psychosocial functioning (Saint-Georges & Vaillancourt, 2020; Zeigler-Hill, 2011). Self-esteem might act as a mechanism underlying the associations between postdivorce family functioning and children’s psychosocial problems on the long run, or be a risk factor. According to the vulnerability model, low self-esteem would increase the probability of poor adjustment when confronted with stressful or negative experiences (Zeigler-Hill, 2011), which are likely to occur shortly after divorce. Although self-esteem and internalizing problems are related (Stadelmann et al., 2017) and both result from the complex interaction between biological and environmental factors, differences in their etiology and correlations between the two constructs suggest that self-esteem and internalizing problems are distinct from each other (Sowislo & Orth, 2013). As biological factors (i.e., genetic influences, physiological regulatory processes, neurotransmitters, and brain structures) might play a more prominent role in the development of internalizing problems (Waszczuk et al., 2016; Zahn-Waxler et al., 2000) than in the development of self-esteem, which might be more strongly affected by social feedback (Leary, 2011, 2012), this could mean that self-esteem is more susceptible to multiple social and family relations. Future research should examine the specific role of children’s self-esteem after divorce more thoroughly.

## The compensatory and exacerbating effects of sibling relationship quality

Despite the direct associations of the sibling relationship with postdivorce adjustment of children, none of the interaction terms were significantly associated with child adjustment. Hence, in contrast to several previous findings in intact families (Milevsky & Levitt, 2005; Voorpostel & Blieszner, 2008), no buffering nor exacerbating effects of the sibling relationship were found in the current sample of recently divorced families.

Because children reported relatively high levels of parent–child relationship quality in the current sample, it could be that there was simply not enough parent–child adversity to either buffer or exacerbate. This is in line with the perspective that the sibling relationship is found to be merely *complementary* to that of parents when children receive adequate parental support and are able to transition to a satisfactory reorganized family system, as opposed to the *compensatory* perspective (Jacobs & Sillars, 2012; Milevsky & Levitt, 2005). Although the current study focused on potential compensatory effects, future research could also benefit from examining (negative and positive) spillover from the parent–child systems into the sibling dyad, also referred to as the congruence perspective (Boer et al., 1992).



## Family factors and relative change in psychosocial adjustment

After taking into account initial child adjustment, hence testing for relative change in adjustment, only mother–child relationship quality remained a significant predictor for internalizing problems. Hence, higher mother–child relationship quality was associated with a relative decrease in internalizing problems over time. For change in externalizing problems, the main effect of sibling conflict disappeared. This is congruent with previous studies on longitudinal links between negative sibling interactions and externalizing problems in both divorced families (Hetherington & Clingempeel, 1992) and intact families (Defoe et al., 2013). In the latter study, one sibling's externalizing problems associated with the other sibling's externalizing problems, but negative sibling interactions did not relate to their externalizing problems. However, both previous studies did not include positive sibling relationship aspects, which appeared particularly relevant for relative change in child adjustment in the current study. That is, higher sibling support was related to a relative decrease in externalizing problems over time. In addition, the negative associations between sibling conflict and relative change in self-esteem were only evident when sibling support was low and conflict was high (conflictual relationship), and in cases when both sibling support and conflict were low (disengaged relation). This suggests that in more affect-intense sibling relationships, high sibling support alleviates or buffers the adversity of high sibling conflict regarding their self-esteem.

Although the interaction term between mother–child relationship quality and sibling support was significant, implying that lower mother–child relationship quality related to a decrease in self-esteem when sibling support was low as well, this moderation effect extrapolated on the data. Hence, the interaction effect was significant for values of mother–child relationship quality that were outside the actual range of the current data. This supports the notion that the parent–child relationship quality levels were relatively high in current sample, lacking substantive adversity to either buffer or exacerbate by the sibling relationship. Future research could benefit from examining whether similar patterns emerge in recently divorced families that are more representative for the entire population of children who experience parental divorce.

## Limitations and strengths

In addition to the well-adjusted sample that was relatively small in size, the current study had some other limitations that should be taken into account when interpreting the results. First, the current study sample predominantly consisted of divorced parents with a medium to high socioeconomic status (SES). In addition, it consisted primarily of White, ethnic majority families, as is the case with many of the studies we based our hypotheses on. However, it is unclear whether these patterns of results can be generalized to samples with other racial or ethnic minority backgrounds. Many family studies suffer from this limitation (e.g., Fakkell et al., 2020), including most of the studies cited in this article, warranting the need to conduct similar research with a more diverse sample with regard to SES and racial and ethnic background. Second, aspects of the sibling relationship other than support and conflict may also be related to child adjustment after divorce, as features such as sibling dominance and parental role taking may be particularly relevant in the context of divorce. Parentification is a more common phenomenon in divorced families than in intact families (Jurkovic et al., 2001; Mayseless et al., 2004), which also entails parents expecting or asking their child(ren) to help with the upbringing of their (younger) sibling(s). Siblings in divorced families do engage in more caretaking behavior (MacKinnon, 1989). Third, previous literature has indicated that the sex combination of the sibling dyad and the age difference between siblings moderate the association between sibling relationship quality and child adjustment (i.e., stronger effects for a higher percentage of brother dyads and for smaller age difference; Buist et al., 2013), which was not taken

into consideration in the current study because of the limited sample size. However, associations between these sibling characteristics and the outcomes in the current study (i.e., internalizing and externalizing problems, and self-esteem) were not significant. Lastly, because we focused on divorced families only, we could not examine the current links in intact families and check whether the associations found in the current study are unique for divorced families.

Despite these limitations, the current study was one of the first to examine the impact of siblings in child adjustment after a recent divorce and over time. Since the first few years after a divorce are often the most turbulent (Wallerstein et al., 2013), and the increased level of sibling conflict after divorce is suggested to be only short-termed (Bush & Ehrenberg, 2003), zooming in on this specific period seems especially relevant for research on family relations and postdivorce child adjustment. The effect of time since the divorce in the current study suggests that both children's internalizing and externalizing problems are more likely to manifest when the (physical) divorce of parents has occurred some time ago rather than directly after, also referred to as the *sleeper effect* (Wallerstein, 1987). The findings also imply that parent-child and sibling relationship quality shortly after the divorce are eminent in explaining differences in postdivorce child adjustment. The longitudinal design of the study allowed for testing over time associations as well as relative change in children's adjustment. Moreover, examining both sibling support and conflict, along with their interaction, contributes to more detailed knowledge on the specific aspects of the sibling relationship. Future research could benefit from inspecting the parent-child relationship quality in more detail when the interplay of multiple family subsystems is of interest, which was outside the scope of the current study with a specific focus on the different aspects of the sibling relationship.

## Conclusions and practical implications

Taken together, the current study supports the notion that—for relatively well-adjusted, White families with a medium to high SES—the sibling relationship is merely *complementary* to that of parents when the parent-child relationship quality is adequate (Jacobs & Sillars, 2012; Milevsky & Levitt, 2005). In contrast to our expectations, hardly any evidence pointed towards a *compensatory or exacerbating* effect of the sibling relationship in the association between parent-child relationship quality and child adjustment. Nevertheless, both sibling support and sibling conflict, and the interaction between these two aspects, were relevant for children's externalizing problems and self-esteem 1 year later, above and beyond the parent-child relationships. That is, sibling conflict was associated with externalizing problems 1 year later, and sibling support was related to a relative decrease in externalizing problems over time. Moreover, higher levels of sibling support were found to alleviate the adversity of high sibling conflict on self-esteem 1 year later as well as for relative change in self-esteem. Knowledge on the interplay between the different aspects of the sibling relationship is especially relevant in the context of divorce, as siblings from divorced families are more likely to experience both high levels of sibling support and conflict (Sheehan et al., 2004).

Based on the current study, it should be evident that the sibling relationship in the context of divorce should no longer be overlooked both in the field of research and practice. Concerning the latter, the potential benefits of including siblings in treatment programs after divorce were already discussed three decades ago (Schibuk, 1989), yet to date, there appear to be no (preventive) intervention programs aimed at divorced families that explicitly target the sibling relationship to improve child adjustment. In addition to the most frequently targeted family subsystems, including siblings in intervention efforts fits with the notion of family systems theory (Cox & Paley, 1997, 2003), and its potential benefit should at least be examined in future studies. Likewise, the advantage of marking sibling conflict (i.e., especially in combination with

low sibling support) as a potential risk factor in the screening procedures of divorced families that seek professional help should be explored.

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