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The Influence of Parent Distress and Parenting on Bereaved Siblings' Externalizing Problems

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Abstract

Objectives Bereaved siblings experience more externalizing problems compared to non-bereaved peers and norms; however, the mechanisms explaining this phenomenon have not been empirically examined. This study tested the serial indirect effects of sibling bereavement on adolescents' externalizing problems through parent distress (i.e., internalizing symptoms) and parenting (i.e., parenting behaviors, parent-adolescent communication).

Methods During home visits, 72 bereaved adolescents (ages 10–18) whose brother/sister died from cancer and 60 comparison peers reported about their externalizing problems and their mothers' and fathers' parenting behaviors (warmth, behavioral control, psychological control) and parent-adolescent communication (open communication, problematic communication). Mothers and fathers reported their own internalizing symptoms.

Results Bereaved siblings reported more externalizing problems ($p = 0.048$) and bereaved mothers reported more internalizing symptoms relative to the comparison group ($p = 0.015$). Serial multiple mediation models indicated that elevated externalizing problems were partially explained by both bereaved mothers' internalizing symptoms and parenting and communication (less warmth [CI: 0.04, 0.86], more psychological control [CI: 0.03, 0.66], and more problematic mother-adolescent communication [CI: 0.03, 0.79]), with a significant indirect effect also emerging for open mother-adolescent communication [CI: 0.05, 1.59]. Bereaved fathers did not significantly differ in internalizing symptoms from comparison fathers ($p = 0.453$), and no significant indirect effects emerged for fathers.

Conclusions Elevated externalizing problems in bereaved siblings may result from mothers' distress and the impact on their parenting and communication. Targeting adjustment and parenting in bereaved mothers following a child's death may reduce externalizing problems in bereaved siblings. Research to evaluate family-centered interventions is needed.

Keywords Bereavement · Parenting · Parent-child communication · Externalizing problems · Maternal depression

The sibling bond is unique, with shared experiences, interconnected development, and expectations of a lifelong relationship (Giovanola 2005; Packman et al. 2006). As such, sibling bereavement during childhood is different from other types of bereavement, but is relatively unexamined compared to parental, child, or spousal bereavement (e.g., Sood et al. 2006). Following the death of a child, bereaved siblings report experiencing sadness, withdrawal, anxiety, anger, fear, and somatic complaints (e.g., Fanos and Nickerson 1991; Foster et al. 2012).

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Considering that adolescent bereaved siblings report more anxiety, depression, and guilt than children or young adults, it is particularly important to understand adjustment to sibling bereavement during adolescence (Fanos and Nickerson 1991). This limited literature has largely focused on grief and internalizing problems (e.g., depression, anxiety, post-traumatic stress disorder; Hoffman et al. 2018; Hogan and Greenfield 1991); however, bereaved siblings also display externalizing reactions, including aggression, argumentativeness, risk taking, and misbehavior (Barrera et al. 2013; Lohan and Murphy 2001–2002; Packman et al. 2006), as well as elevated substance use in the year after death (Rosenberg et al. 2015). Compared to non-bereaved peers and norms bereaved siblings have been found to display more aggression and behavior problems (Birenbaum et al. 1990; Hutton and Bradley 1994). Thus, it is important to better understand risk mechanisms in the development of externalizing problems in bereaved siblings during adolescence.

Theoretical models from the developmental literature point to dysfunctional parent-adolescent interactions as a mechanism in the development of externalizing problems. Specifically, Patterson's Coercion Theory and the Structural Analysis of Social Behavior framework (SASB; Beveridge and Berg 2007) propose that hostility, low warmth, and parental control are risk factors for adolescent externalizing problems, with harsh and negative parenting behaviors inadvertently reinforcing problem behaviors in adolescents. It is further postulated that parental depression increases adolescents' risk for externalizing problems by interfering with parenting, with parenting dimensions of warmth, behavioral control, and psychological control found to mediate the relation between parent internalizing problems and adolescents' externalizing problems (e.g., Kwok et al. 2005; Papp et al. 2005; Robila and Krishnakumar 2006).

These mechanisms may be particularly important in the context of sibling bereavement, as bereaved parents have reported both elevated internalizing symptoms and altered parenting following the death of a child (deCinque et al. 2006; Gilmer et al. 2012). From a family systems perspective, the death of a family member is expected to affect dyadic relationships, functional roles, and the family system as a whole (Walsh and McGoldrick 2013). Thus, from a family systems perspective, surviving siblings' adjustment would be expected to derive directly from grief, but also indirectly from changes in family relationships (e.g., mother-child relationship, father-child relationship), the role siblings play in the family (e.g., protecting their parents, role reversal), and effects of parental changes (e.g., changes in parenting behaviors; Walsh and McGoldrick 2013). More specifically, it has been argued that bereaved parents provide less attention and emotional support to surviving siblings as a result of their own grief and adjustment difficulties (McCown and Davies 1995; Sood et al. 2006). Bereaved siblings' aggression and externalizing problems are further hypothesized to be motivated in part to solicit attention from bereaved parents (McCown and Davies 1995). Indeed, bereaved parents report decreased availability, attention, and support for surviving siblings (deCinque et al. 2006), with parents reporting that bereaved siblings seek out more parental attention (Barrera et al. 2013). Bereaved parents also report more internalizing problems, anxiety, depression, and parental stress compared to non-bereaved parents and norms (Rosenberg et al. 2012), with bereaved parents and surviving siblings both describing parents as more sad and anxious post-death (Gilmer et al. 2012). Thus, bereaved parents who experience elevated distress may be less capable of providing optimal parenting to bereaved siblings as a result of elevated internalizing symptoms.

Importantly, family communication has been identified as a critical factor in bereaved siblings' adjustment (Giovanola 2005; Hoffman et al. 2018; Packman et al. 2006), with open parent-sibling communication and a close parent-sibling relationship linked to less grief, lower anxiety, and fewer behavior problems for bereaved siblings following the child's death (Lövgren et al. 2018; Lövgren et al. 2016; Packman et al. 2006). Conversely, siblings who were unable to express their grief-related feelings or discuss the death were left feeling overlooked and alone (Packman et al. 2006). Although the sibling bereavement research is limited and based largely on qualitative reports, parenting variables have been studied extensively in the context of parental bereavement. Warmth and effective discipline from surviving parents are consistently related to children's adjustment following parent death (Haine et al. 2008), with low parental warmth and ineffective discipline associated with externalizing problems (Kwok et al. 2005). Furthermore, positive parenting has been found to significantly correlate with bereaved fathers' posttraumatic stress symptoms, depression, and grief, and to mediate the association between bereaved fathers' and surviving siblings' depression (Morris et al. 2016). Thus, in addition to parent-sibling communication, low parental warmth, psychological control, and ineffective discipline are parenting behaviors that may also explain the increased rates of externalizing problems in bereaved siblings and mediate the relation between parental distress and sibling externalizing problems. However, the links between bereaved parents' internalizing symptoms, parenting/communication, and bereaved siblings' externalizing problems have not been empirically demonstrated and additional research is needed to characterize the influence of bereaved parents' internalizing difficulties and parenting on externalizing problems in bereaved siblings.

Families of children who die following an extended illness (e.g., cancer) are often characterized by less attention and altered parenting for healthy siblings even prior to death; thus, siblings bereaved due to an extended illness, such as cancer, may be at even greater psychosocial risk due to months or years of treatment (Gerhardt et al. 2015; Walsh and McGoldrisk 2013; Wilkins and Woodgate 2005). For example, siblings of children with cancer have been found to experience decreased parental attention; decreased financial resources; increased household responsibilities; altered routines; identity changes; and missed school, extracurricular, and social experiences as a result of the child's illness and are at increased risk for adjustment difficulties as a result (e.g., anxiety, depression, behavior problems; Gerhardt et al. 2015; Samson et al. 2016; Wilkins and Woodgate 2005). Furthermore, poor family functioning and parenting behavior (e.g., more psychological control, less acceptance) in the context of childhood cancer are associated with sibling distress (Long et al. 2013), with bereaved parents reporting that parent-sibling relationship problems worsened following the child's death (Barrera et al. 2009). Therefore, it may be particularly important to elucidate these family processes in the context of sibling bereavement due to childhood cancer.

The sibling bereavement literature has been further limited by the lack of comparison groups, heterogeneity in sibling age at death, retrospective study designs several years after the death, heterogeneity in type of death, and an over-reliance on maternal data. These distinctions are important to consider as grief reactions can vary depending on the child's developmental level (Barrera et al 2013; Fanos and Nickerson 1991), time since death (i.e., more severe grief when death is more recent; Hoffman et al. 2018; Rosenberg et al. 2012), type of death (Hogan et al. 2001), and parent gender (Alam et al. 2012). Time since death is found to relate to grief responses, with decreased grief over time (Rosenberg et al. 2012; Rosenberg et al. 2015); however, siblings have also been found to experience distress more than 18 months after the death (Hogan and Greenfield 1991). Furthermore, parent grief reactions are found to vary according to the method of death (e.g., homicide, illness, suicide; Hogan et al. 2001) and the extent to which the death was unexpected or violent (Barry et al. 2002); thus, heterogeneity in type of child death may obscure findings. Lastly, mothers have often been examined as the primary caregiver, with less known about fathers' adjustment and their role in sibling adjustment following bereavement. The limited bereavement literature including fathers suggests that mothers experience more distress and show more overt grief reactions than fathers following the death of a child (Alam et al. 2012; deCinque et al. 2006). Fathers have also been found to cope by focusing on work and activities outside of the home, with mothers instead reporting coping by focusing on surviving children (Alam et al. 2012). Moreover, although much of the literature has focused on mothers, bereaved fathers' adjustment has been found to indirectly relate to sibling depression though positive parenting in a similar manner as proposed for bereaved mothers. Thus, it is critical to extend this literature to better understand how fathers might contribute to bereaved siblings' externalizing problems.

The present study sought to elucidate possible mechanisms explaining externalizing problems in bereaved siblings using a sample of adolescents whose sibling died from cancer on average one year prior to study participation and a matched non-bereaved comparison. Specifically, we examined the indirect effect of sibling bereavement on adolescents' externalizing problems through parents' (mothers and fathers, separately) internalizing symptoms and parenting practices (i.e., parenting behaviors, parent-adolescent communication). It was hypothesized that bereaved siblings would endorse more externalizing problems than non-bereaved comparison adolescents (Hypothesis 1). Secondly, it was hypothesized that bereaved mothers and fathers would endorse more internalizing symptoms than non-bereaved parents, with bereaved siblings reporting less parental warmth, less behavioral control, less open parent-adolescent communication, more psychological control, and more problematic communication (Hypothesis 2). Lastly, it was hypothesized that bereavement would be indirectly associated with elevated externalizing problems through elevated parental internalizing problems and less optimal parenting/parent-adolescent communication (Hypothesis 3). In other words, it was predicted that bereaved parents would report more internalizing symptoms, which would in turn be associated with less optimal parenting behavior (i.e., less warmth, more psychological control, and less behavioral control) and parent-adolescent communication (i.e., less open and more problematic), and ultimately contribute to more externalizing problems in bereaved siblings.

Method

Participants

Bereaved families

Of 169 eligible families, 105 bereaved siblings participated in the school visit. Ten families were not followed longitudinally due to relocation of the study investigator. A total of 88 families participated in the home visit. Children 8–9 years were omitted from these analyses because they were too young to complete our parent-adolescent communication measure; they did not differ from the remaining 72 participating siblings in sex, race, or study variables (all

p-values ns). Sibling relationships were classified as full (85%, $n = 61$), half (8%, $n = 6$), step (4%, $n = 3$), or adoptive (3%, $n = 2$). Deceased children were approximately half female (54%, $n = 39$), 12.29 years of age ($SD = 5.07$, range = infancy - 24 years) at time of death, and diagnosed 32.04 months ($SD = 26.15$) prior to death. Data collection occurred an average of 11.68 months ($SD = 3.72$, range 6–24 months) after the child's death. Data were also collected from 69 bereaved mothers and 43 bereaved fathers of children ages 10–18, including 3 families with only a father participating, 29 families with only a mother participating, and 40 families with two parents participating.

Comparison families

Comparison families were matched to bereaved families on adolescent age, gender, and race. Of the eligible families, 60 adolescents 10–18 years participated; suitable comparisons were unable to be recruited for 12 bereaved siblings (e.g., school declined data collection, not enough peers of matched race/sex). Data were also collected from 55 mothers and 35 fathers, including 3 families with only a father participating, 23 families with only a mother participating, and 32 families with two parents participating. Comparison families did not significantly differ from bereaved families in adolescent age, adolescent sex, race, SES, father age, parent marital status, or parent education; however, comparison mothers were significantly older than bereaved mothers by an average of two years. Adolescent and parent demographic data are noted in Table 1.

Procedures

This research was part of a larger study assessing sibling and parent adjustment following the death of a child from cancer. Initial data were collected in the classrooms of bereaved siblings (Gerhardt et al. 2012), followed by home visits with bereaved and non-bereaved comparison families. This paper uses cross-sectional data collected at the home visits. We identified potentially eligible surviving sibling(s) using cancer registries and initial recruitment letters were mailed 3–12 months after the death. At recruitment, eligible siblings were: (a) 8–18 years old, (b) without full-time special education, (c) English-speaking, and (d) living <100-miles from the hospital. To be inclusive of diverse family structures, full, half-, step-, and adoptive siblings were eligible if regular ongoing contact had occurred. One sibling was randomly selected in families with multiple eligible siblings using a random number generator. One peer who was the same race and sex and closest in birthdate to the bereaved sibling was identified from each sibling's classroom. If the family declined, the next closest classmate was recruited. All comparison families were screened to ensure that they had not experienced the death of a child. In both bereaved and comparison families mothers and fathers were each invited to participate; however, families were eligible as long as at least one parent participated. Although bereaved families were initially contacted for recruitment 3–12 months post-death, home visits took place an average of 11.68 months ($SD = 3.72$, range 6–24 months) after the child's death.

IRB approval was obtained at each of three children's hospitals in the United States (Midwest, South) and Canada.

Table 1 Demographic information across study groups

Percentages					
	Bereaved group	Comparison group	χ^2 (df)	*p*	*OR*
Sibling sex (% Female)	59.7	53.3	0.54 (1)	0.461	1.30
Sibling race (% White)	76.4	86.7	2.25 (1)	0.133	0.50
Mother race (% White)	82.6	89.1	1.20 (1)	0.273	0.56
Father race (% White)	81.4	91.4	1.62 (1)	0.203	0.41
Mother marital status (% Married)	65.3	76.7	2.04 (1)	0.153	0.58
Father marital status (% Married)	91.1	91.7	0.01 (1)	0.930	0.91
	Mean (SD)		*t* (df)	*p*	*d*
Sibling age	13.19 (2.23)	13.18 (2.21)	−0.03 (130)	0.979	<0.01
Mother age	40.38 (6.57)	42.27 (6.79)	1.99 (124)	0.048	0.35
Father age	43.16 (6.65)	42.11 (6.68)	−0.14 (79)	0.891	0.03
Mother years education	13.61 (1.63)	13.84 (1.57)	1.43 (124)	0.154	0.25
Father years education	14.07 (1.68)	14.03 (1.63)	0.98 (79)	0.331	0.22
Family SES	49.62 (22.49)	51.12 (22.45)	0.92 (130)	0.703	0.07

Bereaved group $N = 72$ siblings, 69 mothers, 43 fathers; Comparison group $N = 60$ siblings, 55 mothers, 35 fathers

SES socio-economic status based upon Duncan Total Socioeconomic Index (TSEI) for head of household

Table 2 Means, standard deviations, and ANCOVAs/T-Tests comparing bereaved vs. comparison groups across variables

ANCOVAs *M* (*SD*)				
	Bereaved group	Comparison group	*F (df)*	*η*
Externalizing Problems	51.71 (9.03)	48.57 (8.44)	4.00 (1, 121)*	0.032
M. Internalizing Problems	56.46 (11.87)	51.00 (10.86)	6.10 (1, 123)*	0.048
M. Warmth	24.78 (4.72)	26.84 (3.25)	5.98 (1, 123)*	0.046
M. Psychological Control	17.43 (4.24)	16.37 (3.46)	*1.72 (1, 123)*	0.014
M. Behavioral Control	20.93 (3.74)	20.88 (3.37)	0.09 (1, 123)	0.001
M. Open Communication	37.37 (8.32)	41.42 (6.92)	8.21 (1, 121)**	0.064
M. Problematic Communication	27.82 (6.66)	25.91 (7.45)	2.14 (1, 122)	0.017
	T-Tests *M* (*SD*)		*t (df)*	*d*
F. Internalizing Problems	48.86 (9.48)	49.43 (11.71)	0.76 (76)	0.17
F. Warmth	23.50 (5.81)	24.90 (4.65)	*1.50 (123.53)*	0.27
F. Psychological Control	*16.89 (4.53)*	*15.80 (3.64)*	−1.50 (123.60)	0.27
F. Behavioral Control	20.85 (4.29)	21.07 (3.90)	0.30 (123)	0.05
F. Open Communication	34.33 (10.15)	38.47 (8.69)	2.42 (123)*	0.44
F. Problematic Communication	26.42 (7.82)	25.78 (6.83)	−0.48 (123)	0.09

Bereaved group $N = 72$ siblings, 69 mothers, 43 fathers; Comparison group $N = 60$ siblings, 55 mothers, 35 fathers. ASR and YSR analyses were conducted using raw scores, but means are reported as T-scores for purpose of interpretation. Italicized t-statistics denote comparisons with unequal variances assumed across groups in accord with Levine's Test for Equality of Variances. ANCOVAs controlled for maternal age as a covariate

M mother, *F* father

*$p < 0.05$, **$p < 0.01$

Informed consent was obtained from all individuals included in the study, with parents providing written informed consent and children providing written informed assent. Parents and children independently completed questionnaires in a fixed order with a trained research assistant. Questionnaires were read to participants who needed assistance. Families were compensated for their time ($50–100 per family, depending on the site), with each site compensating bereaved and comparison families the same amount.

Measures

Children's externalizing problems

The Youth Self-Report (YSR; Achenbach and Rescorla 2001) is a 112-item inventory that assesses social, emotional, and behavioral aspects of children's functioning. The YSR yields eight subscale scores for emotional and behavioral problems and two subscales for social competence. Higher order factors include Total Competence, Total Problems, Internalizing Problems, and Externalizing Problems. The YSR has established reliability and validity (Achenbach and Rescorla 2001). Analyses examined Externalizing Problems using raw scores per manual recommendations (Achenbach and Rescorla 2001); however, T-scores derived from a nationally representative sample are reported to aid with interpretation (Table 2). T-scores exceeding 64 are considered clinically elevated (Achenbach and Rescorla 2001).

Parental internalizing problems

Mother and father internalizing symptoms were assessed using the Adult Self-Report (ASR; Achenbach and Rescorla 2003). This 126-item measure for adults ages 18 to 59 years old yields eight syndrome subscales for emotional and behavioral functioning, along with subscales measuring adaptive functioning and substance use. Higher order factors include Total Problems, Internalizing Problems, and Externalizing Problems. Reliability and validity are established (Achenbach and Rescorla 2003). Analyses examined Internalizing Problems using raw scores, with T-scores reported to aid with interpretation (Table 2). T-scores exceeding 64 are considered clinically elevated (Achenbach and Rescorla 2003).

Parenting behaviors and parent-adolescent communication

Adolescents reported on mother and father parenting behaviors using the revised Children's Report of Parent

Behavior Inventory (CRPBI-30; Schludermann and Schludermann 1988). Adolescents rated each parent separately on this 30-item questionnaire using a 3-point scale ranging from 1 (*not like my parent*) to 3 (*a lot like my parent*). The questionnaire yields three subscales: Acceptance *vs.* Rejection, Psychological Control *vs.* Psychological Autonomy, and Firm Control *vs.* Lax Control. Each subscale contains 10 items. For this study, we used the following labels to describe each respective dimension of parenting: Warmth (e.g., "My mother is someone who often praises me." "My mother is someone who cheers me up when I am sad"), Psychological Control (e.g., "My mother is a person who says that if I really cared for her, I would not do things that cause her to worry," "My mother is someone who if I have hurt her feelings, stops talking to me until I please her again"), and Behavioral Control (e.g., "My mother is someone who believes in having a lot of rules and sticking with them," "My mother is someone who lets me go anyplace I please without asking"). Scores on each subscale can range from 10–30. Cronbach's alphas for the three subscales were acceptable to excellent ($\alpha = 0.88$–0.92, $\alpha = 0.75$–0.79, and $\alpha = 0.75$–0.80, respectively) in our sample.

The Parent-Adolescent Communication Scale (PACS; Barnes and Olson 1985) assessed communication between adolescents and their parents. Adolescents reported separately about their mothers and fathers. This 20-item measure is comprised of two factors: Openness in Communication and Problems in Communication. Openness in Communication refers to adolescents' perspective of positive interaction patterns with their parent(s) characterized by ease in communication, free expression, and satisfaction with exchanges. Openness is reflected in such items as "If I were in trouble, I could tell my mother" and "When I ask questions, I get honest answers from my mother." Problems in Communication refers to adolescents' perception of negative communication patterns, including negative adolescent-parent interactions and reluctance and selectivity in disclosing information. Problems in Communication are assessed using items such as "My mother has a tendency to say things to me which would be better left unsaid" and "I don't think I can tell my mother how I really feel about some things." Adolescents rated their agreement with each statement using a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with scores on each subscale ranging from 10–50. Strong validity and test-retest reliability have been established ($r = 0.77$–0.78; Barnes and Olson 1985). In our sample, internal reliability for the Openness and Problems subscales were excellent ($\alpha = 0.90$–0.93) and acceptable ($\alpha = 0.76$–0.78), respectively.

Data Analyses

Descriptive statistics and Pearson correlations were computed for all adjustment and parenting variables. Analysis of covariance (ANCOVA) was used to examine whether adolescent self-report of externalizing problems (Hypothesis 1), mothers' self-report internalizing symptoms, and adolescents' report of mothers' parenting behaviors and communication (Hypothesis 2) differed for bereaved versus non-bereaved comparison families. Given group differences in maternal age, this variable was included as a covariate. T-tests (two-sided; $\alpha = 0.05$) compared fathers' self-report of internalizing symptoms and adolescents' report of fathers' parenting behaviors and communication (Hypothesis 2) for bereaved versus non-bereaved comparison fathers. Serial multiple mediation models were used to examine the indirect effects of bereavement status on adolescents' externalizing problems (Hypothesis 3). Models were tested separately for mothers and fathers using a PROCESS macro developed by Hayes (2013) for SPSS, which uses ordinary least squares path analysis and 10,000 bias-corrected bootstrap confidence intervals. Bereavement status was included as a dichotomous independent variable (bereaved = 1, comparison group = 0). The indirect effect of bereavement status on adolescents' externalizing problems was tested according to three possible indirect effects: (1) through parent internalizing problems, (2) through parenting behaviors (warmth, psychological control, behavioral control) or parent-adolescent communication (open communication, problematic communication), and (3) through both parent internalizing problems and parenting behaviors/parent-adolescent communication. Maternal age was included in maternal models as a covariate. Indirect effects are interpreted as significant if the 95% bootstrap confidence interval excludes zero.

Results

Preliminary Analyses

Means and standard deviations for all study variables are displayed separately for the bereaved and comparison groups (Table 2). Paired-samples t-tests revealed that mothers endorsed significantly more internalizing symptoms compared to fathers in the bereaved group, $t\ (39) = 4.78$, $p < 0.001$, but not in the comparison group, $t\ (31) = 0.45$, $p = 0.657$). Across groups, children described mothers as more open in communication ($t\ [123] = 3.38$, $p < 0.001$), warmer ($t\ [126] = 3.60$, $p < 0.001$), and more psychologically controlling ($t\ [126] = 2.18$, $p = 0.03$) compared to fathers.

Table 3 Correlations between all variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. M. Internalizing Problems	–											
2. F. Internalizing Problems	0.37**	–										
3. M. Warmth	−0.27**	−0.04	–									
4. F. Warmth	−0.19*	−0.12	0.54***	–								
5. M. Psychological Control	0.26**	0.10	−0.37***	−0.01	–							
6. F. Psychological Control	0.22*	0.14	−0.26**	−0.26**	0.60***	–						
7. M. Behavioral Control	0.11	0.05	−0.38***	−0.14	0.36***	0.15	–					
8. F. Behavioral Control	0.07	0.10	−0.19*	−0.21*	0.09	0.40***	0.36***	–				
9. M. Open Communication	−0.17	−0.08	0.76***	0.40***	−0.44***	−0.36***	−0.33***	−0.08	–			
10. F. Open Communication	−0.17	−0.17	0.49***	0.84***	−0.16	−0.37***	−0.16	−0.20*	−0.54***	–		
11. M. Problematic Communication	0.21*	0.06	0.46***	−0.22*	0.42***	0.34***	0.29**	0.10	−0.39***	−0.28**	–	
12. F. Problematic Communication	0.19*	0.05	−0.21*	−0.47***	0.22*	0.53***	0.12	0.22*	−0.17	−0.48***	0.62***	–
13. Externalizing Problems	0.33***	0.03	−0.42***	−0.37***	0.37***	0.32***	0.10	0.11	−0.27**	−0.39***	0.49***	0.37***

$N = 132$

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Correlations for all study variables are presented in Table 3. Mothers' internalizing symptoms were significantly correlated with maternal parenting, mother-adolescent communication, and adolescent externalizing problems in the expected direction. Fathers' internalizing symptoms were not significantly correlated with parenting variables or adolescents' externalizing problems. Adolescents' externalizing problems were significantly correlated with parenting and communication for both parents in expected directions. Adolescents' perceptions of behavioral control were not significantly correlated with either parental internalizing problems or adolescent externalizing problems, nor did they differ according to bereavement status; therefore, behavioral control was excluded from serial mediation models.

Bereaved versus Non-Bereaved Differences in Adjustment Outcomes

ANCOVA (Table 2) revealed a significant difference in adolescents' externalizing problems (Hypothesis 1), with bereaved siblings reporting more externalizing problems than comparison peers. Clinically elevated externalizing problems were reported by 7 (10%) bereaved siblings versus 2 (3%) comparison peers, but no significant difference emerged in frequency of clinically elevated externalizing problems ($\chi^2 = 2.10$, $p = 0.147$). Mothers in the bereaved group also reported significantly more internalizing symptoms (Hypothesis 2), with T-scores corresponding to clinically elevated internalizing symptoms for 15 (22%) bereaved mothers versus 7 (12%) comparison mothers ($\chi^2 = 1.70$, $p = 0.192$). Bereaved fathers did not report significantly more internalizing symptoms, with 5% of bereaved fathers and 14% of comparison fathers endorsing clinically elevated internalizing symptoms ($\chi^2 = 2.19$, $p = 0.139$). Adolescents in the bereaved group perceived their mothers as less warm and reported less open communication with both mothers and fathers. No significant group differences emerged in adolescents' report of parent psychological control, behavioral control, problematic parent-child communication, or father warmth; however, maternal psychological control was significantly associated with maternal age such that younger mothers were perceived by adolescents as using more psychological control.

Serial Mediation Models

Indirect effects of bereavement status (bereaved vs. comparison group) on adolescent externalizing problems were examined separately for mothers and fathers. The following mediators were tested using four serial mediation models for each parent: parent internalizing symptoms (M1) and parenting variables (M2; warmth, psychological control, open communication, problematic communication). It was hypothesized that bereavement would relate indirectly to adolescents' externalizing problems through both parent internalizing symptoms and parenting variables (i.e., X→M1→M2→Y; Hypothesis 3). Results from these analyses are displayed in Table 4 and Fig. 1.

All four maternal models explained a significant amount of variance in adolescents' externalizing problems. Significant indirect effects emerged through both mediators (i.e., maternal internalizing problems [M1] and parenting behavior/communication [M2]) for maternal warmth, psychological control, and problematic mother-adolescent communication. Bereaved status was associated with more internalizing symptoms in mothers, which in turn was associated with less warmth and ultimately more adolescent externalizing problems (see Fig. 1a for unstandardized regression coefficients). With regard to psychological control (Fig. 1b), bereaved mothers reported more internalizing

Table 4 Serial multiple mediation analyses predicting adolescent externalizing problems

Mediators				Indirect effects		
(M1) Parent internalizing	(M2) Parenting/communication	R^2	*F* (*df*)	Ind1	Ind2	Ind3
Mothers	Warmth	0.23	9.01 (4119)***	**0.64 [0.07, 1.96]**	**0.25 [0.04, 0.86]**	**0.73 [0.05, 1.96]**
	Psych. Control	0.21	7.89 (4119)***	**0.69 [0.08, 1.95]**	**0.20 [0.03, 0.66]**	0.27 [−0.39, 1.11]
	Open Com.	0.16	5.54 (4117)***	**0.71 [0.08, 2.07]**	0.06 [−0.01, 0.34]	**0.57 [0.05, 1.59]**
	Problematic Com.	0.31	13.11 (4118)***	**0.61 [0.07, 1.83]**	**0.26 [0.03, 0.79]**	0.44 [−0.54, 1.67]
Fathers	Warmth	0.08	2.14 (3,76)	−0.02 [−0.62, 0.30]	−0.03 [−0.61, 0.02]	0.33 [−0.15, 2.20]
	Psych. Control	0.08	2.31 (3,76)	−0.01 [−0.50, 0.27]	−0.04 [−0.46, 0.03]	0.22 [−0.47, 1.12]
	Open Com.	0.10	2.95 (3,76)*	0.01 [−0.35, 0.60]	−0.06 [−0.70, 0.02]	0.67 [−0.04, 2.82]
	Problematic Com.	0.11	3.26 (3,76)	−0.04 [−0.73, 0.16]	−0.01 [−0.19, 0.08]	0.28 [−0.55, 1.24]

Indirect effects are presented as unstandardized regression coefficients and their respective confidence intervals. Bolded indirect effects signify significant indirect effects as evidenced by a 95% bias-corrected confidence interval not including zero. Maternal models included mother age as a covariate

Psych psychological, *Com* communication, *Ind1* X→M1→Y, *Ind2* X→M1→M2→Y, *Ind3* X→M2→Y

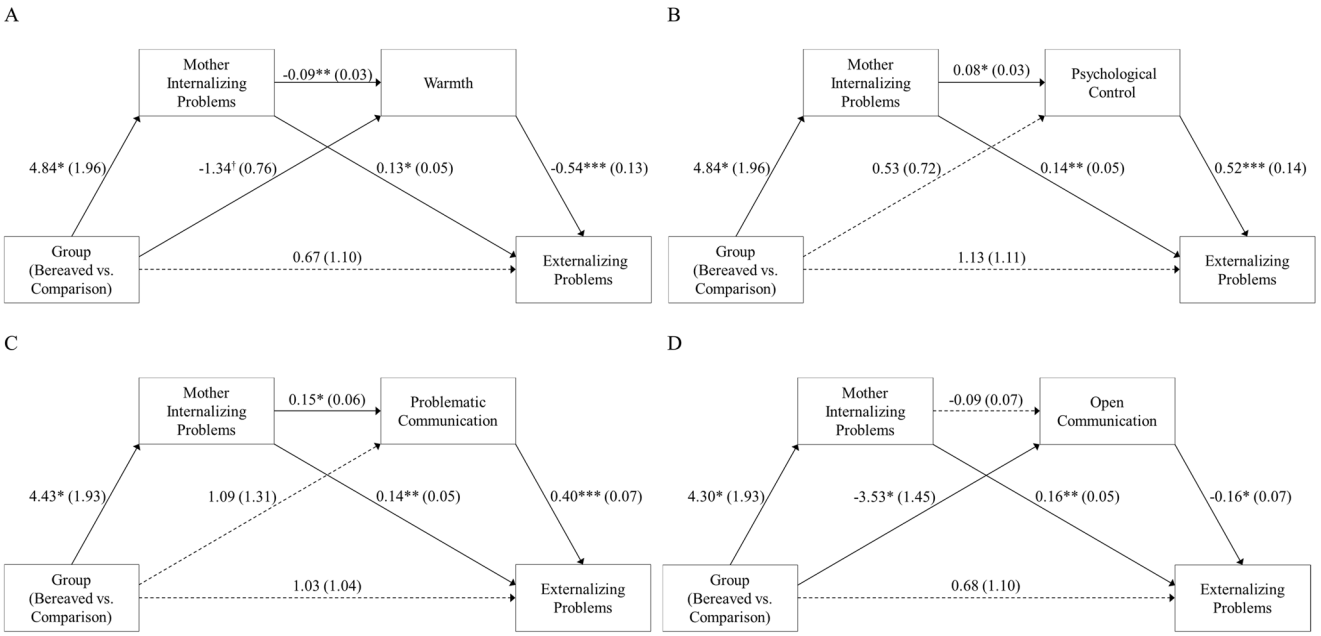

Fig. 1 Serial multiple mediation models testing the mediating effects of **a** maternal warmth, **b** maternal psychological control, **c** problematic mother-adolescent communication, and **d** open mother-adolescent communication on adolescents' externalizing problems. Unstandardized regression coefficients and standard errors. $^{\dagger}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

symptoms, which in turn was associated with more psychological control and ultimately more adolescent externalizing problems. On note, maternal age was negatively associated with maternal psychological control, $B = -0.10$, $p = 0.047$. A similar pattern emerged for adolescents' perception of problematic mother-adolescent communication (Fig. 1c) such that elevated maternal internalizing symptoms were associated with more problematic mother-adolescent communication, which was in turn associated with more externalizing problems. Bereavement was also indirectly related to adolescent externalizing problems separately through each mother internalizing symptoms and adolescents' perception of low openness, but not through both mediators sequentially (Fig. 1d). Of note, mother internalizing symptoms were not significantly associated with adolescent's perception of open mother-adolescent communication. In all four models, the direct effect of bereavement status on adolescent externalizing problems was no longer significant after accounting for the mediating variables.

Neither fathers' internalizing symptoms nor adolescents' perception of fathers' parenting and communication significantly mediated the association between bereavement status and adolescent externalizing problems (Table 4). Although a smaller sample size limited our ability to find significant effects with fathers according to *p*-values, smaller effect sizes were also generally found for father analyses compared to mother analyses across t-tests (Table 2),

correlations (Table 3), and the amount of variance explained in serial mediation models (Table 4), further supporting weaker effects for fathers versus mothers.

Discussion

The death of a child has significant and lasting implications for both parents and surviving siblings, including increased risk for externalizing problems among bereaved siblings (e.g., Packman et al. 2006). Although it has been proposed that siblings demonstrate elevated externalizing problems in part due to parenting deficits (e.g., decreased warmth) resulting from parents' own grief and distress (e.g., McCown and Davies 1995), this had not been examined empirically. The present study tested the serial indirect effects of sibling bereavement on adolescents' externalizing problems through parent distress (i.e., internalizing symptoms) and parenting (i.e., parenting behaviors, parent-adolescent communication). As predicted, elevated externalizing problems among bereaved siblings (relative to comparison peers) were partially explained by mothers' distress and parenting; however, no significant indirect effects emerged through fathers' distress or parenting.

Consistent with prior research (Birenbaum et al. 1990), bereaved siblings reported more externalizing problems than comparison peers (Hypothesis 1), with three times as many bereaved siblings endorsing clinically significant externalizing problems, further supporting that this population is at elevated risk for adjustment problems. However, consistent with prior literature (Hoffman et al. 2018), average externalizing problems were still within normal limits in both groups, with only 10% of bereaved adolescents endorsing clinically elevated externalizing problems and no significant difference in the percentage of adolescents endorsing clinically significant externalizing problems. Thus, subsequent findings do not necessarily reflect predictors of externalizing diagnoses but rather the tendency toward engaging in externalizing behaviors. Nonetheless, findings are also consistent with qualitative reports that bereaved adolescent siblings engage in such externalizing behaviors as risky behavior (e.g., drinking, tattoos), aggression, and misbehavior (Barrera et al. 2013; Lohan and Murphy 2001–2002; Packman et al. 2006).

Similarly, bereaved mothers reported more internalizing symptoms relative to comparison mothers (Rosenberg et al. 2012; Hypothesis 2), with 22% of bereaved mothers endorsing clinically elevated internalizing symptoms. Bereaved siblings also described their mothers as less warm and less open in their communication relative to comparison mothers. This is consistent with prior qualitative reports of decreased parental availability, attention, and support, as well as increased distance between family members (deCinque et al. 2006; Foster et al. 2012). Findings suggest that mothers experience adjustment difficulties in the year after their child's death and exhibit parenting deficits that may place surviving siblings at increased risk for adjustment difficulties. Surprisingly, bereaved fathers' distress was neither elevated compared to non-bereaved fathers nor associated with adolescents' externalizing problems. This is consistent with findings that bereaved mothers display more intense distress than bereaved fathers (e.g., Alam et al. 2012). As in other bereavement studies, more fathers declined participation compared to mothers (Barrera et al. 2013); thus, one possibility is that less distressed fathers self-selected into this study. However, bereaved siblings reported less open communication with their fathers relative to comparison peers, suggesting that bereaved fathers may still experience impaired parenting of surviving siblings following the death of a child. Counter to predictions, behavioral control did not significantly differ for bereaved and comparison families, nor was it significantly associated with adolescents' externalizing problems. This is surprising given that effective discipline has emerged as a key factor in the parental bereavement literature (e.g., Haine et al. 2008; Kwok et al. 2005). However, in contrast with parental bereavement, which leaves only one surviving parent, the effect of behavioral control may instead depend on the overall pattern of discipline bereaved siblings experience across both parents.

Consistent with the parental bereavement literature (Kwok et al. 2005; Hypothesis 3), group differences in bereaved siblings' externalizing problems were partially explained by mothers' elevated distress and impaired parenting (i.e., decreased warmth, increased psychological control). Distressed mothers may find it challenging to be warm with surviving children and, in turn, surviving siblings may engage in alternative strategies to obtain attention, including misbehavior. This is consistent with bereaved mothers' report that they have less patience, tolerance, and energy for parenting surviving children due to grief (Barrera et al. 2007). Moreover, bereaved parents have described feeling like their grief is in conflict with their parenting role, reporting that they find it difficult to balance their own grief with their child's needs (Shankar et al. 2017). With regard to psychological control, more distressed mothers may engage with surviving siblings in a manner perceived as psychologically intrusive and emotionally controlling, with adolescents perhaps responding with externalizing behavior to assert autonomy. For example, bereaved parents have reported being apprehensive, guarded, and overprotective with surviving siblings (Arnold and Gemma 2008; Cacciatore et al. 2013–2014). Bereaved parents have also reported devoting their time to the surviving sibling and described parenting the surviving sibling as their life's purpose (Barrera et al. 2009; Barrera et al. 2013), with some parents

describing themselves as overwhelming the sibling (Cacciatore et al. 2013–2014). Thus, an alternative possibility is that bereaved siblings may find this additional devotion and focus to be intrusive, particularly if it is framed in the context of their mothers' grief. These indirect effects are also consistent with research examining the influence of maternal depression on children's externalizing problems (Papp et al. 2005; Robila and Krishnakumar 2006), suggesting that this mediational pathway is not unique to the context of sibling bereavement but may instead be set in motion by bereaved mothers' increased distress.

As hypothesized (McCown and Davies 1995; Sood et al. 2006; Hypothesis 3), elevated externalizing problems among bereaved siblings were also explained in part by adolescents' perception of problematic mother-adolescent communication. Increased internalizing problems in bereaved mothers may result in a disengaged mother-adolescent relationship that in turn may reinforce acting out in bereaved siblings. Alternatively, maternal distress may lead some mothers to over-disclose concerns, potentially disrupting family interaction patterns. Although maternal distress and less open mother-adolescent communication both appeared to mediate the association between sibling bereavement and externalizing problems, there was surprisingly no evidence of a sequential effect. Specifically, the nonsignificant association between mothers' internalizing symptoms and open mother-adolescent communication suggests that maternal distress might not be the reason for less open communication patterns in bereaved dyads. Instead, bereaved mothers may be less open due to discomfort or uncertainty about how to communicate with the sibling. Alternatively, these findings may also be explained by reports of increased family distance (Foster et al. 2012). Importantly, communication is a dyadic process, with less open communication perhaps also stemming from siblings' discomfort talking about the deceased child or attempts to protect their parents, particularly mothers (Barrera et al. 2013; deCinque et al. 2006). Regardless, the present findings implicate both maternal distress and less open mother-adolescent communication in bereaved siblings' externalizing problems, but as separate, non-serial processes, suggesting that it may be beneficial for interventions to target both mother distress and mother-adolescent communication.

In contrast, indirect effects did not emerge for fathers' internalizing symptoms or parenting/communication. Although the limited sample size affected our ability to find statistical significance, effects sizes suggest fathers' internalizing symptoms are less strongly associated with parenting and externalizing problems ($r = 0.03$–0.17) relative to mothers' internalizing symptoms ($r = 0.11$-0.33). These findings suggest that perhaps fathers may be able to play a role in mitigating the risk linked with bereaved mothers' distress. Although father internalizing symptoms were not significantly associated with parenting or father-adolescent communication, bereaved siblings perceived their fathers as communicating less openly relative to comparison fathers. Rather than internalizing symptoms, limitations in father-adolescent communication may instead be a product of gender differences in parent coping, with bereaved fathers reporting that they immerse themselves in work and grieve privately after the death of a child (Alam et al. 2012; deCinque et al. 2006). Mother and father parenting variables also differentially relate to child adjustment, with a different pattern of correlates for mothers versus fathers (Leinonen et al. 2003), so impairments in bereaved fathers' communication may instead affect other domains of bereaved siblings' adjustment (apart from externalizing problems), such as sibling depression (Morris et al. 2016). Given the scant research with bereaved fathers, it is also possible that existing measures may not adequately capture the bereavement experience of fathers or that other elements (e.g., grief, stress) are more important, such as fathers' experience of posttraumatic stress symptoms (Morris et al. 2016).

Findings highlight the importance of screening for parental adjustment even when the target client is the bereaved sibling. Given that mothers may struggle to engage in optimal parenting practices when overwhelmed by significant distress (e.g., McCown and Davies 1995; Sood et al. 2006), decreasing bereaved mothers' distress may be key to reducing siblings' risk for externalizing problems via a trickle-down effect of improved maternal parenting. Preliminary support has been found for providing emotional support to bereaved parents, fostering the parent-sibling relationship, and facilitating open parent-sibling communication (Horsley and Patterson 2006). Extensive support has also been found for interventions that indirectly treat parentally bereaved children by targeting caregiver mental health, parenting, and the caregiver-child relationship (Bergman et al. 2017). Given findings that bereaved parents discontinue treatment services at higher rates than the general population and perceive services to be ineffective (Lichtenthal et al. 2015), the development of quality interventions for bereaved parents is a critical need.

Limitations

Findings should be considered within the context of several limitations, including the cross-sectional and correlational nature of the research design, limiting our ability to make causal or directional statements. Links between study variables may also be bidirectional, with problematic communication, low maternal warmth, or sibling externalizing problems perhaps intensifying maternal distress. Additionally, although groups were matched on sibling demographic characteristics, groups were not matched on parental

characteristics and maternal age significantly differed across groups. Group differences in maternal age may in part contribute to group differences in parenting; however, findings did not differ when maternal age was included as a covariate. The wide range in time since death (i.e., 6 – 24 months) is also a limitation, potentially obscuring shorter versus longer-term effects. This may be particularly relevant in the context of externalizing problems, as research suggests that externalizing behavior increases during the first year post death but decreases after the first year (Rosenberg et al. 2015). Longitudinal research to replicate these effects and examine changes in parenting prospectively is needed. For example, this literature may benefit from prospective, longitudinal studies that follow bereaved families shortly after the death, thus limiting heterogeneity in time since death and allowing for the examination of how early changes in parent's adjustment and parenting relate to changes in siblings adjustment over time.

The small sample of fathers limits our power to detect statistically significant effects, as well as our ability to further assess mothers' and fathers' adjustment and parenting in a more dynamic manner. It is possible that the overall combination of parenting behavior is more predictive of siblings' adjustment, with mothers or fathers perhaps compensating for each other. Additionally, parenting may differentially affect sons and daughters (Leinonen et al. 2003). However, inclusion of fathers can also be considered a strength of the study, as hypotheses derived from primarily maternal research were not supported in the case of bereaved fathers. Continued inclusion of fathers will be critical for future research, as well as more broadly considering paternal factors that may be uniquely related to adjustment in bereaved siblings. For example, fathers' experience of posttraumatic stress symptoms and prolonged grief may be more relevant for siblings' adjustment (Morris et al. 2016). Future research may consider a wider range of paternal adjustment outcomes to tease apart paternal factors that might relate to siblings' adjustment. Given differences in findings for mothers versus fathers, future research might take a more dyadic approach to examine whether there might be cross-over or compensatory effects.

Families in this study were primarily white despite recruitment from three different hospitals across the U.S. and Canada. Additionally, IRB regulations precluded us from collecting demographic and clinical data for families who declined participation; thus, we were unable to compare participants to those who declined, further obscuring the representativeness of this sample to the broader population. Findings may also only generalize to siblings bereaved to pediatric cancer, or potentially other chronic illnesses, but not necessarily to other types of death. However, the significant overlap in findings with parental bereavement research (e.g., Kwok et al. 2005) suggests that these patterns are likely not unique to this population. Given the scant quantitative research comparing parenting in a sibling bereaved population to a matched comparison group, these findings offer an important first look at the role of parents in bereaved siblings' externalizing problems and highlight mediators that should be further considered in the broader sibling bereavement literature. Specifically, future research should continue to examine parent-adolescent communication, parental warmth, and psychological control as possible mechanisms to explain adjustment problems in bereaved siblings. Moreover, intervention research targeting mothers' internalizing symptoms, parenting, and parent-adolescent communication may assist in better understanding these possible mechanisms in the context of sibling bereavement.

This study also has several strengths, including the use of a non-bereaved comparison group, the inclusion of fathers, focusing on a single type of death (cancer), and the inclusion of a narrower age range (adolescents). Understanding modifiable family factors (e.g., parent distress, parenting behaviors) that may shape the adjustment of bereaved siblings is critical to identifying potential targets for intervention. This study suggests that intervening to decrease mothers' internalizing symptoms could potentially reduce risk for externalizing problems among surviving siblings by improving mothers' parenting (e.g., increased warmth, decreased problematic communication). Thus, heightened externalizing problems in surviving siblings may be ameliorated through screening and early intervention for bereaved families aimed at improving mothers' coping, adjustment, parenting behaviors, and communication.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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