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Conflict Resolution and Emotional Expression in Sibling and Mother-Adolescent Dyads: Within-Family and Across-Context Similarities

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Abstract

Early adolescents (aged 12-15) were observed during dyadic conflict discussions with their siblings ($n = 23$) and mothers ($n = 32$) in their homes. The verbal conflict behaviors and affect of family members were coded continuously. Sequential analyses identified temporal associations between individuals' affect and their own and their partners' verbal conflict behaviors. In addition, within-family and across-context similarities in behavior were examined. Results revealed that while many links between emotion and behavior were consistent with previous research (e.g., attack/assert when frowning/upset, withdraw/concede when sad), several differences emerged depending on the relationship (sibling vs. mother-adolescent) and position in the family (e.g., adolescent vs. mother). Furthermore, many within-family

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similarities were observed in responses to emotion, while adolescents showed few similarities in their behavior across contexts. Results are discussed in relation to the developmental context of early adolescence and family systems theory.

Keywords
conflict, siblings, mother-child, family systems, observational

Siblings form some of the most enduring and influential bonds, and their interactions often generate strong emotions and significant conflict. Their relationships are highly variable, as they can be characterized by both great love and support as well as intense conflict and hostility. Early adolescents' ability to manage these emotions and resolve conflict with their siblings contributes to the quality of their relationships and their socioemotional adjustment (Buist, Deković, & Prinzie, 2013; Campione-Barr, Greer, Schwab, & Kruse, 2014). However, little is known as to how early adolescents and their siblings behave in relation to emotions generated by conflict, as well as how these patterns of behavior develop. According to family systems theory, relationships within the family are interconnected (Minuchin, 2001, 1988). In addition, youth learn conflict behaviors through innumerable co-constructive experiences with their family members, who reinforce one another's behavior over time (Parke & Buriel, 2006). As such, patterns of behavior may be shared across early adolescents' conflicts with their siblings and with their mothers. For example, similarities in self-reported conflict tactics have been found across marital, parent-child, and sibling conflict, and these similarities have been hypothesized to occur through a process called "interaction-based transmission" (Noller, 2005). In the present study, behaviors and emotional expressions were observed during dyadic conflict between early adolescents and their siblings and mothers. A microscopic approach was used to assess early adolescents' and their family members' responses to their own and each other's emotions during conflict. Within-family and across-context similarities in behavior were also assessed. Results offer a detailed picture of the links between emotion and behavior of early adolescents during sibling and mother-adolescent conflict. Furthermore, they provide a clearer understanding of the interconnections between family relationships in adolescence, as a result of long-standing and evolving histories of co-constructive experiences within the family.

Siblings have a unique influence on youths' social, emotional, and cognitive development (Dirks, Persram, Recchia, & Howe, 2015). In ways that differ from parents and peers, they provide "support, guidance, and companionship,

as well as intense emotional experiences [that] range from intense love to intense hostility" (Noller, 2005, p. 2). Unsurprisingly then, sibling relationship quality predicts internalizing and externalizing problems across childhood and adolescence, above and beyond parent-child relationships (Solmeyer, McHale, & Crouter, 2014; Whiteman, Solmeyer, & McHale, 2015). A meta-analysis found that while conflict, warmth, and parental differential treatment all predicted internalizing and externalizing problems, frequency and intensity of conflict was the strongest predictor (Buist et al., 2013). As the transition to adolescence is a period of heightened risk for psychopathology (Kessler et al., 2005), sibling conflict during this period warrants greater attention.

Conflict in Sibling Relationships

While intense conflict is predictive of maladjustment, it is also a normative part of sibling relationships (Campione-Barr & Killoren, 2019). Siblings are not chosen, they spend the most time together, and their relationships are characterized by uninhibited affect and behavior. As a result, they are often the most conflictual of all youths' relationships (Furman & Buhrmester, 1985; Punch, 2008). Early adolescence is marked by particularly frequent sibling conflict, as youths' need for autonomy grows and must be negotiated within the contexts of shared space and resources, as well as increasingly egalitarian sibling relationships (Abuhatoum, Della Porta, Howe, & DeHart, 2020; Davies, Parry, Bascoe, Martin, & Cummings, 2019). That said, not all forms of conflict are equal. Constructive conflict is characterized by attempts to reason, understand the other's perspective, and generate solutions, whereas destructive conflict involves coercion, dismissal of the other's perspective, and escalating levels of negative affect (Deutsch, 1973). While much of the sibling literature has measured conflict as a single, negative phenomenon, studies that consider this distinction show that destructive conflict is uniquely tied to adjustment problems and poor relationship quality (Killoren, Thayer, & Updegraff, 2008; Recchia & Howe, 2009). This is likely because destructive behaviors are reinforced within the dyad over time, and youth who develop these maladaptive patterns with their siblings miss out on opportunities afforded by constructive conflict (Stocker, Burwell, & Briggs, 2002).

Conversely, constructive conflict resolution with siblings teaches youth cooperative and prosocial behavior (Lindell, Campione-Barr, & Greer, 2014; Noller, 2005). Conflicts in which siblings attempt to reason, understand the other's perspective, provide support, and problem-solve result in more compromises and are associated with greater intimacy and warmth (Killoren et al., 2008; Ross, Ross, Stein, & Trabaso, 2006). As sibling relationships are generally permanent, they serve as a safe practice ground in which to engage

in conflict without risking relationship dissolution (Recchia, Wainryb, & Pasupathi, 2013). Given that siblings share power more equally than in parent-child relationships, their conflict also allows them to practice resolution tactics that are more applicable to peer relations (DeHart, 1999). Thus, intense conflict with siblings in preadolescence is associated with peer difficulties in adolescence (Bank, Burraston, & Snyder, 2004). In addition, adults report using similar strategies in conflict with romantic partners as they used with their siblings in adolescence (Shalash, Wood, & Parker, 2013). Understanding the processes involved in sibling conflict is therefore an important avenue of research, as behaviors may generalize to relationships outside the family.

To date, the adolescent sibling conflict literature has relied almost exclusively on self- and parent-reports. This may partially explain the emphasis on the negative effects of conflict, as questionnaire measures tend to focus on the frequency and intensity of disagreements (e.g., Buist & Vermande, 2014; Solmeyer et al., 2014). Observational studies that utilize microscopic approaches offer a richer account of *how* disagreements are resolved and of the intricacies of dyadic behavior, as they measure specific, minute behaviors that can then be tied to broader patterns (Baesler & Burgoon, 1987). This type of observational methodology has been useful in describing sibling conflict in earlier childhood. For example, children have been shown to develop more sophisticated conflict behaviors from early to middle childhood (Abuhatoum et al., 2020). Early adolescence is an important developmental period to observe sibling interactions, given the high rates of conflict and the fact that strategies likely change as youths' perspective-taking and emotion regulation abilities continue to advance (Humphrey & Dumontheil, 2016; Morris, Criss, Silk, & Houltberg, 2017). The only observational study of adolescent sibling conflict that we know of supports the idea that destructive sibling conflict alone predicts maladaptive outcomes (Campione-Barr et al., 2014). This highlights the need for further observational research, in order to expand our understanding of the processes involved in destructive and constructive sibling conflict. The present study addressed these limitations, using sequential analyses of naturalistic conflict discussions between early adolescents and their siblings to uncover how the behaviors of both siblings unfold in relation with the emotional context of the interaction, in addition to studying these same processes in conflict between adolescents and their mothers.

Emotion in Family Conflict

The emotional climate of conflict interactions, including the affect expressed by both individuals, has an important influence on youth behavior. In an observational study of sibling conflict in middle childhood, Recchia and

Howe (2010) found that children who believed that they alone felt angry during conflict with their siblings were less likely to compromise when attempting to resolve the conflict, compared to those who perceived that both they and their siblings felt angry. In addition, compromises were more likely when children reported sadness. These findings are in line with goal-based theories of emotion, that associate anger with a desire to reach one's personal goals, which are perceived to be attainable. Conversely, sadness is associated with the abandonment of unattainable personal goals and a refocus on attempting to repair damage to the relationship (Raffaelli, 1992; Sanford, 2007).

Recchia and Howe (2010) identified key links between emotion and behavior during sibling conflict. However, retrospective reporting of children's emotional experiences was utilized, which does not take into account how moment-to-moment changes in affect can influence changes in behavior. In an observational study of mother-preadolescent conflict, Ferrar et al., (2020) used sequential analysis to identify how emotions and behaviors of mothers and preadolescents were linked at a microscopic level. They found that in both mothers and preadolescents, anger predicted increased use of destructive behaviors and assertive communication immediately after, whereas sadness was associated with more avoidance and withdrawal, as well as more conciliatory behavior. They also showed that neutral affect predicted the most use of constructive conflict behavior in both mothers and preadolescents, suggesting that regulating negative emotions facilitates effective conflict resolution (Gottman, 1993; Ferrar et al., 2020). Positive affect predicted more avoidance (e.g., joking, off-topic discussion) in mothers and preadolescents, and in preadolescents alone, constructive behavior as well. Finally, they reported that preadolescents and mothers responded in similar ways to each other's emotions as they did to their own emotions, supporting Recchia and Howe's (2010) findings which suggested that interpersonal partners' emotions also motivate behavior. For example, while their own anger may especially motivate preadolescents to confront their mothers, seeing their mothers angry could provoke defensiveness in the adolescents, and similarly lead to confrontative behavior. Given that significant changes occur to relationships and socioemotional abilities across childhood, applying this methodology to conflict in early adolescence is an essential step to identify how moment-to-moment changes in both individuals' emotions predict behavior across developmental periods and relationships. Sequential analysis of observed behaviors is an ideal method, as it allows for the measurement of links between emotion and behavior at a microscopic level, and can be applied to a sample of any size (Yoder & Tapp, 2004).

Identifying moment-to-moment associations between emotion and behavior in early adolescent *sibling* conflict is especially critical, as sibling

relationships are unique in several ways. First, unlike mother-child relationships, sibships are relatively egalitarian, especially by adolescence, when imbalances in knowledge and experience decrease (Lindell & Campione-Barr, 2017). Parent-child conflict usually ends in win-loss outcomes favoring the parent, whereas sibling conflict often results in standoffs, with children reporting high rates of passive strategies such as avoidance and withdrawal (Raffaelli, 1992; Recchia, Ross, & Vickar, 2010). Second, sibling relationships evoke particularly intense and wide-ranging emotions, which could provoke stronger or more variable reactions to one another (Persram, Scirocco, Della Porta, & Howe, 2019; Shortt & Gottman, 1997). Third, their relationships are especially uninhibited, with youth being less driven to regulate themselves when interacting with their siblings, compared to with their parents or peers (Punch, 2008). This includes being less concerned about hurting their siblings or temporarily damaging their relationship (Dirks et al., 2015; Recchia et al., 2013). Given the particularities of sibling relationships, a deeper understanding of how adolescents behave in relation to their own and their siblings' emotions during conflict is needed.

The Sibling Relationship as Part of the Larger Family

Beyond illustrating how early adolescents as a group respond to emotion during sibling conflict, a final question concerns how individual adolescents learn these behavioral patterns. According to family systems theory, dyadic subsystems within the family (e.g., the sibling subsystem, the mother-child subsystem) are interdependent, mutually influencing one another over time (Minuchin, 2001, 1988). Still, parent-child and sibling relationships are most often studied separately. There has been a call for more research to consider both subsystems in conjunction, in order to better understand their interrelations (Bank et al., 2004; Buist & Vermande, 2014). While it is recognized that subsystems influence one other, the ways in which this occurs is less clear. On the one hand, there is evidence of compensation: for instance, close sibling relationships are protective in the context of poor parenting or interparental conflict (Davies et al., 2019; Whiteman, McHale, & Soli, 2011). Conversely, studies have found positive associations between relationship quality in parent-child and sibling relationships, providing support instead for congruence across family relationships (Jenkins, Rasbash, Leckie, Gass, & Dunn, 2012; Stormshak, Bullock, & Falkenstein, 2009). These results are often understood in terms of the "spillover" hypothesis, namely, that emotions experienced in one subsystem spread to others (Engfer, 1998; Low, Overall, Cross, & Henderson, 2019).

Studies of conflict behavior specifically have found greater evidence for congruence, rather than compensation (Buist, Deković, & Gerris, 2011; Noller, 2005). Adolescents report similar communication patterns in conflicts with their parents as with their siblings (Noller, Feeney, Sheehan, & Peterson, 2000). Likewise, preadolescents and their family members report similar use of constructive and destructive conflict tactics across all subsystems (i.e., parent-child, sibling and marital; Rinaldi & Howe, 2003). Noller and colleagues have termed this phenomenon "interaction-based transmission," arguing that children learn patterns of conflict behavior through interactions with their parents, and then carry over these behaviors to their conflicts with their siblings (Noller, 2005; Noller et al., 2000). The idea of congruence in conflict behavior is in line with dynamic systems and transactional perspectives, which posit that children learn behavioral patterns through exchanges with their family members, and these behavioral patterns influence their functioning in other settings (Hollenstein, 2013; Sameroff, 2009). In the context of destructive conflict, this could involve a spillover of negative affect, reinforcement of maladaptive tactics, as well as a lack of opportunity to develop more constructive conflict resolution patterns.

As mentioned earlier, studies of sibling conflict in adolescence have relied almost exclusively on questionnaires, and this includes those that found similarities in conflict behavior across family subsystems (Noller et al., 2000; Rinaldi & Howe, 2003). The present study therefore assessed whether family members showed similarities in their observed responses to negative emotions during conflict, as well as whether early adolescents demonstrated similar behaviors across contexts (i.e., sibling and mother-adolescent conflicts). These questions were addressed by assessing the partial correlations between equivalent responses to negative emotions (e.g., the tendency of both siblings to escalate conflict following angry affect) of family members and within adolescents across contexts. The focus on responses to negative emotions in evaluating similarities was informed by evidence that negative interpersonal interactions have greater effects than positive interactions (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). It has also been argued that the management of negative emotions during conflict is especially important (Shortt & Gottman, 1997). First, conflict almost always necessitates the communication of a negative emotion or attitude, given that opposition is inherent to conflict (Shantz, 1987). Second, uninhibited, reciprocal, and escalating negative affect are characteristic of destructive conflict, which is linked with individual maladjustment and relationship distress (Killoren et al., 2008; Ross et al., 2006). Indeed, past research has highlighted the particular role of destructive conflict between siblings in adolescent outcomes (Campione-Barr et al., 2014; Solmeyer et al., 2014). Thus, we were particularly

interested in assessing evidence for within-family transmission of behavioral responses to negative emotions.

The Present Study

In the present study, the emotional expressions and verbal behaviors of early adolescents (referred to as "focal adolescents") and their siblings (referred to as "siblings") and mothers were observed during conflict discussions. The first objective was to identify and compare the links between emotion and behavior in sibling and mother-adolescent conflict. Specifically, the temporal relationships between emotional expressions (i.e., sad/distressed, frowning/upset, neutral, and positive affect) and individuals' own and their partners' subsequent verbal conflict behaviors were assessed separately for: (a) focal adolescents interacting with their siblings, (b) siblings interacting with the focal adolescents, (c) focal adolescents interacting with their mothers, and (d) mothers interacting with the focal adolescents. It was expected that the associations found between individuals' own emotions and behaviors observed during family conflict in other developmental periods (Recchia & Howe, 2010; Ferrar et al, 2020) would be replicated in the present study. That is, it was hypothesized that participants would use more destructive (i.e., escalating) and assertive behavior following angry affect (displayed by frowning/upset expressions); more conciliatory and avoidant behavior following sad affect; more constructive (i.e., de-escalating) behavior following neutral affect; and more constructive and avoidant behavior following positive affect. Following their partners' affect, it was hypothesized that mothers and adolescents would show similar, yet weaker associations between affect and behavior, as this pattern was seen in conflict discussions between mothers and preadolescents in a prior study (Ferrar et al., 2020). No hypotheses were made with regard to focal adolescents or siblings' responses to each other's affect, given the paucity of literature on this subject.

The second objective was to assess within-family and across-context similarities in responses to negative (i.e., angry and sad) affect, given the particular role of negative emotion regulation during conflict (Shortt & Gottman, 1997; Solmeyer et al., 2014). Specifically, the relationships between (a) the behavior of individuals within the same family and (b) the behavior of focal adolescents across conflict contexts (i.e., sibling and mother-adolescent conflict) were assessed. As self-report studies of family conflict have found congruence between tactics used across family subsystems (Noller et al., 2000; Rinaldi & Howe, 2003), positive associations were expected between equivalent behaviors (e.g., tendency to escalate conflict following angry affect) of family members and within adolescents across contexts.

Method

Participants

The participants in the present study were a subset of the Concordia Longitudinal Research Project (Concordia Project), a prospective, longitudinal study of the intergenerational transfer of socioeconomic and psychosocial risk. The focus of the current study was a subsample of the second generation of participants, who completed videotaped interactions with their mothers and one of their siblings in early adolescence. Thirty-two offspring of original Concordia Project participants, aged 12 to 15 years (i.e., "focal adolescents"), participated. Focal adolescents were 22 girls and 10 boys, with a mean age of 13.9 years ($SD = 0.84$). Their mothers had a mean age of 42.6 years ($SD = 3.41$) and a mean level of education of 13.1 years (i.e., 2 years post-secondary; $SD = 2.61$). All focal adolescents lived with their mothers. The majority (85.19%) lived in two-caregiver homes (40.74% with married parents, 44.44% with cohabitating parents), while 14.81% lived in single-caregiver homes. All focal adolescents were observed with their mothers. Twenty-three focal adolescents (14 girls and nine boys) had a sibling living in the home, and these adolescents were also observed in interaction with a sibling. When they lived with more than one sibling, the sibling who was younger than and/or closest in age to the focal adolescent was selected. The siblings were 8 to 20 years of age ($\bar{X} = 14.10$, $SD = 3.88$) and were 13 girls and 10 boys. Of the 23 sibling pairs, 11 were mixed-gender, eight were girl-girl, and four were boy-boy. The age difference between the focal adolescents and their siblings ranged from 0.00 (one set of twins) to 5.82 years ($\bar{X} = 3.29$, $SD = 1.68$). Thus, while the siblings had a wider age range than focal adolescents, the age gap between sibling pairs was minimized in the selection of participating siblings when possible. The majority of families were Euro-Canadian and French-speaking.

Procedure

Ethics approval was granted by the University's human research ethics review board prior to data collection. Families were contacted by telephone, and verbal consent was obtained at this time. Standard home visits were conducted by a trained research assistant. All procedures took place on the same day. After informed written consent was obtained, focal adolescents engaged in videotaped interactions, first with their mothers, and then with their siblings. First, mother-adolescent dyads played a board game (Jenga) together. Next, they discussed a pleasant family experience. They then engaged in the mother-adolescent conflict task. After a short break, focal

adolescents then discussed a pleasant family experience with their siblings, and finally, engaged in the sibling conflict task. In the present study, only the sibling conflict task and the mother-adolescent conflict task were used. Participants were given lists of 10 topics that are common sources of conflict between siblings (e.g., respect of privacy, sharing of computer, chore sharing) and 18 topics that are common sources of conflict between parents and adolescents (e.g., chores, respecting rules, choice of friends). In each case, both individuals rated separately, on a 5-point Likert-type scale, the extent to which each topic was a source of disagreement between them (1 = *never* to 5 = *always*). These questionnaires have been adapted from prior studies (e.g., Granger, Weisz, & Kauneckis, 1994) to include a comprehensive list of common sources of conflict between adolescents and their family members and have been used effectively in prior Concordia Project studies (e.g., Ferrar et al., 2020; Martin et al., 2012). For the sibling conflict task, the experimenter selected the topic rated highest by both the focal adolescent and their sibling, and dyads were instructed to discuss the topic for 6 minutes while videotaped. For the mother-adolescent conflict task, the experimenter selected two topics rated highest by both mother and adolescent, and dyads were instructed to discuss each topic for 6 minutes while videotaped. In the present study, only one mother-adolescent conflict discussion (the discussion of the higher-rated topic) was used. This procedure ensured that the topics discussed in the conflict tasks were those that were rated as the greatest sources of conflict within the given relationships. Within the sibling task, 80.95% of dyads agreed on the topic chosen being the most contentious issue between them. Within the mother-adolescent conflict task, 92.59% of dyads agreed on the topic chosen being the greatest source of disagreement. Dyads who expressed no longer being able to discuss their topic before the task elapsed (sibling dyads: $n = 12$, 52.17%; mother-adolescent dyads: $n = 6$, 18.75%) were given their next highest-rated topic. Three sibling dyads (13.04%) discussed three topics. None of the mother-adolescent dyads discussed more than two topics.

Measures

Demographic information. Participant age, sex, and maternal education were collected using the Demographic Information Questionnaire, which has been used effectively in past Concordia Project studies (e.g., Briscoe et al., 2019).

Observational coding. Observational coding was conducted with Mangold INTERACT 18. The same two coding systems were used to code the sibling conflict task and the mother-adolescent conflict task. Both individuals in

each task were coded continuously with each coding system. Two trained researchers independently coded 30% of each sample (mother-adolescent and sibling). Cohen's kappa values ranged from substantial to near perfect on both coding systems, for both samples (.68 to .87; Landis & Koch, 1977). Raters were blind to dyads' scores on all other measures, and one coder on each coding system was blind to hypotheses. The two coding systems had different primary and secondary coders. The order in which participants were coded was counterbalanced.

The Conflict Behavior Coding System assessed participants' verbal conflict behaviors. Behaviors were coded continuously for the length of the conflict task. The coding system was inspired by well-validated systems (e.g., Gottman, 1979; Sillars, 1986) and was adapted to suit sibling and mother-adolescent interactions as well as a mutually exclusive and exhaustive format. The six codes were listening (silent and attending to speaking partner), analytic remarks (providing or requesting information in a nonconfrontational manner), conciliatory remarks (expressing a desire to resolve the conflict in a mutually satisfactory way or by prioritizing partner's desires), disagreement (disagreement with or rejection of the partner's argument), confrontative remarks (attempts to achieve one's own goals or to thwart partner's goals with hostile or argumentative intent), and avoidance/withdrawal acts (behaviors that minimize discussion of the conflict).

The Emotion Behavior Coding System–Adapted was used to code nonverbal emotional expressions. The coding system was adapted from the Emotion Behavior Coding System (Enns & Stack, 2007), which was designed based on existing literature (e.g., Batum & Yagmurlu, 2007; Perez & Riggio, 2003). Additional specification of operational definitions was made based on the coding system used in Moed et al. (2015), and codes were adapted to be mutually exclusive and exhaustive. Emotions were coded continuously, as one of four codes: smile/positive, frown/upset (i.e., angry), sad/distressed, and neutral affect. Codes were assigned primarily based on facial expressions, with tone of voice and body language being used when clarification was necessary (e.g., to differentiate a sarcastic smile from positive affect).

Plan of Analysis

Time-window sequential analysis was conducted using Generalized Sequential Querier 5.1.23 (Bakeman & Quera, 2016), respecting accepted procedures (Bakeman & Quera, 2011; Yoder & Tapp, 2004). Temporal relationships between emotional expressions and individuals' own and their partners' subsequent verbal conflict behaviors were assessed separately for: (a) focal adolescents interacting with their siblings, (b) siblings interacting with focal

adolescents, (c) focal adolescents interacting with their mothers, and (d) mothers interacting with focal adolescents. Time windows were specified as 5-second intervals after the onset of specific emotional expressions ("given" behaviors). Conflict behaviors ("targets") that occurred within those windows were tallied for ensuing analyses. Pooled odds ratios were calculated for each contingency with a base rate above the recommended cut-off of five (Bakeman & Quera, 2011). Odds ratios with 95% confidence intervals that did not include one were considered statistically significant at the .05 level. Statistically significant odds above 1 indicate that the target is more likely to occur after the given behavior; odds ratios below 1 indicate that the target is less likely to occur after the given behavior.

To assess within-family and across-context relations between responses to negative emotions, target behaviors were collapsed into three categories: escalate (disagreement or confrontative remarks), de-escalate (analytic or conciliatory remarks), and avoid/withdraw. Yule's Q values were computed for each dyad, for each contingency of interest. Based on hypotheses, contingencies of interest were the temporal relationships between each negative emotional expression (i.e., frown/upset and sad/distressed) and each category of behavior (escalate, de-escalate, and avoid/withdraw). Yule's Q is an effect size that ranges from −1 to +1, with 0 indicating no effect, negative values indicating a negative relationship, and positive values indicating a positive relationship. For example, if a dyad's Yule's Q for adolescent de-escalating following sibling sad/distressed affect is .60, the adolescent is more likely to use de-escalating behaviors following her sibling's expression of sad/distressed affect. Yule's Qs are less skewed than odds ratios and can be used as continuous variables in subsequent analyses (Bakeman & Quera, 2011). They can only be calculated if both the given and the target behaviors occurred within the dyad's interaction. Partial correlations were used to assess (a) relations between Yule's Qs pertaining to equivalent responses to emotions of participants within the same family and (b) relations between Yule's Qs pertaining to equivalent responses to emotions of focal adolescents in the two conflict contexts. Focal adolescent age and sex were entered as controls in all analyses, and sibling age and sex were also controlled in analyses involving the sibling conflict task.

Results

Objective 1

Results of time-window sequential analyses assessing temporal relationships between (a) adolescents' and siblings' affect, and their own and their partners'

verbal conflict behaviors, and (b) adolescents' and their mothers' affect, and their own and their partners' verbal conflict behaviors, are shown in Tables 1 and 2, respectively. Three contingencies in the mother-adolescent task (*adolescent sad/distressed → adolescent confrontative remark, mother neutral → adolescent confrontative remark*, and *adolescent sad/distressed → mother confrontative remark*) were excluded as they did not meet the minimum base rate of five (Bakeman & Quera, 2011).

Adolescents' and siblings' responses to their own emotions during sibling conflict. Focal adolescents and siblings responded in similar ways to their own emotions during sibling conflict. Following frown/upset affect, they were more likely to make confrontative remarks, disagree, and make analytic remarks and were less likely to avoid/withdraw. Following sad/distressed affect, they avoided/withdrew more, and siblings made more conciliatory remarks. Following their neutral affect, both groups made more conciliatory remarks. Focal adolescents also made more analytic remarks and disagreed less. Following their smile/positive affect, both groups avoided/withdrew more. Focal adolescents also made fewer analytic remarks, and siblings were less likely to disagree.

Adolescents' and siblings' responses to each other's emotions during sibling conflict. Both similarities and differences were seen in focal adolescents' and siblings' responses to each other's emotions. Following their partners' frown/upset affect, both groups were more likely to disagree. Siblings also made more confrontative remarks following focal adolescents' frown/upset affect, as well as following focal adolescents' sad/distressed affect. Following their partners' neutral affect, both groups were more likely to make analytic remarks and avoid/withdraw. Focal adolescents also made more conciliatory remarks. Finally, following their siblings' smile/positive affect, focal adolescents made more analytic remarks and disagreed less.

Adolescents' and mothers' responses to their own emotions during mother-adolescent conflict. During mother-adolescent conflict, both groups were more likely to disagree and make confrontative and analytic remarks following their own frown/upset affect. Adolescents also made fewer conciliatory remarks following their frown/upset, whereas mothers avoided/withdrew less. Following sad/distressed affect, both adolescents and mothers made more conciliatory remarks and disagreed less. Adolescents also avoided/withdrew more and made fewer analytic remarks. The reverse was true of mothers, who made more analytic remarks and avoided/withdrew less following their sad/distressed affect. Following their neutral affect, both

Table 1. Time-Window Sequential Analysis of Focal Adolescents' and Siblings' Responses to Their Own and Their Partners' Emotions.

Given emotional expression	Odds	95% CI	Odds	95% CI	Odds	95% CI	Odds	95% CI	Odds	95% CI
Focal ado behavior	Focal ado analytic remark		Focal ado avoidance/ withdrawal act		Focal ado conciliatory remark		Focal ado confrontative remark		Focal ado disagreement	
Focal ado frown/upset	1.72*	[1.44, 2.04]	0.48*	[0.27, 0.85]	1.11	[0.81, 1.51]	2.21*	[1.26, 3.87]	2.96*	[2.41, 3.65]
Focal ado sad/distressed	1.00	[0.70, 1.43]	1.99*	[1.15, 3.45]	1.22	[0.72, 2.02]	0.74	[0.18, 3.01]	0.66	[0.37, 1.18]
Focal ado neutral	1.29*	[1.11, 1.49]	1.12	[0.83, 1.53]	1.28*	[1.02, 1.61]	1.17	[0.70, 1.94]	0.73*	[0.60, 0.90]
Focal ado smile/positive affect	0.82*	[0.68, 0.99]	1.77*	[1.28, 2.46]	1.06	[0.81, 1.40]	0.93	[0.49, 1.75]	0.97	[0.76, 1.23]
Sibling frown/upset	0.85	[0.69, 1.05]	0.65	[0.40, 1.05]	1.01	[0.75, 1.37]	1.66	[0.93, 2.98]	2.71*	[2.20, 3.33]
Sibling sad/distressed	1.32	[0.91, 1.91]	0.58	[0.18, 1.81]	0.97	[0.50, 1.89]	0.53	[0.07, 3.79]	0.88	[0.48, 1.61]
Sibling neutral	1.30*	[1.12, 1.51]	1.55*	[1.14, 2.11]	1.33*	[1.06, 1.67]	1.42	[0.86, 2.36]	0.93	[0.76, 1.14]
Sibling smile/positive affect	1.26*	[1.07, 1.49]	1.39	[0.99, 1.95]	1.26	[0.97, 1.63]	0.69	[0.35, 1.37]	0.65*	[0.50, 0.85]
Sibling behavior	Sibling analytic remark		Sibling avoidance/ withdrawal act		Sibling conciliatory remark		Sibling confrontative remark		Sibling disagreement	
Sibling frown/upset	1.89*	[1.61, 2.23]	0.44*	[0.24, 0.79]	0.92	[0.66, 1.27]	3.73*	[2.52, 5.51]	2.80*	[2.25, 3.49]
Sibling sad/distressed	1.26	[0.87, 1.84]	2.25*	[1.18, 4.28]	1.91*	[1.15, 3.16]	0.61	[0.15, 2.49]	0.82	[0.42, 1.59]
Sibling neutral	1.03	[0.89, 1.20]	1.15	[0.83, 1.58]	1.33*	[1.05, 1.68]	0.70	[0.47, 1.04]	0.99	[0.80, 1.23]
Sibling smile/positive affect	0.87	[0.73, 1.04]	1.72*	[1.22, 2.42]	1.08	[0.82, 1.43]	0.73	[0.44, 1.22]	0.65*	[0.48, 0.86]
Focal ado frown/upset	1.00	[0.82, 1.23]	0.92	[0.58, 1.47]	1.14	[0.83, 1.56]	2.19*	[1.43, 3.37]	2.38*	[1.89, 3.00]
Focal ado sad/distressed	1.09	[0.78, 1.52]	0.29	[0.07, 1.18]	1.40	[0.85, 2.28]	2.04*	[1.03, 4.05]	0.56	[0.29, 1.09]
Focal ado neutral	1.25*	[1.08, 1.45]	1.61*	[1.17, 2.23]	1.27	[1.00, 1.60]	0.92	[0.62, 1.36]	0.93	[0.76, 1.16]
Focal ado smile/positive affect	1.10	[0.93, 1.31]	1.19	[0.82, 1.74]	1.00	[0.75, 1.34]	0.63	[0.37, 1.09]	0.91	[0.70, 1.19]

Note. ado = adolescent; CI = confidence interval.
*$p < .05$.

Table 2. Time-Window Sequential Analysis of Focal Adolescents' and Mothers' Responses to Their Own and Their Partners' Emotions.

Given emotional expression	Odds	95% CI	Odds	95% CI	Odds	95% CI	Odds	95% CI	Odds	95% CI
Focal ado behavior	Focal ado analytic remark		Focal ado avoidance/ withdrawal act		Focal ado conciliatory remark		Focal ado confrontative remark		Focal ado disagreement	
Focal ado frown/upset	1.98*	[1.73, 2.26]	0.36*	[0.20, 0.65]	1.02	[0.83, 1.25]	5.93*	[1.88, 18.67]	3.51*	[2.93, 4.20]
Focal ado sad/distressed	0.78*	[0.65, 0.93]	3.60*	[2.61, 4.96]	1.40*	[1.16, 1.70]	N/A	N/A	0.65*	[0.49, 0.85]
Focal ado neutral	1.10	[0.96, 1.26]	0.67*	[0.45, 0.98]	1.19	[1.00, 1.41]	0.49	[0.11, 2.22	0.70*	[0.56, 0.87
Focal ado smile/positive affect	0.95	[0.81, 1.12]	1.18	[0.81, 1.72]	1.01	[0.83, 1.24]	1.33	[0.36, 4.91]	0.65*	[0.50, 0.84]
Mother frown/upset	1.09	[0.95, 1.24]	0.56*	[0.38, 0.84]	1.11	[0.94, 1.32]	4.64*	[1.40, 15.40]	2.60*	[2.18, 3.11]
Mother sad/distressed	0.92	[0.77, 1.11]	1.76*	[1.20, 2.58]	1.22	[0.99, 1.52]	2.06	[0.56, 7.59]	0.74*	[0.56, 0.99]
Mother neutral	1.53*	[1.34, 1.73]	1.48*	[1.07, 2.04]	1.01	[0.84, 1.20]	N/A	N/A	0.63*	[0.51, 0.79]
Mother smile/positive affect	0.88	[0.72, 1.06]	1.39	[0.92, 2.09]	1.09	[0.87, 1.37]	0.56	[0.07, 4.35]	0.93	[0.71, 1.21]
Mother behavior	Mother analytic remark		Mother avoidance/ withdrawal act		Mother conciliatory remark		Mother confrontative remark		Mother disagreement	
Mother frown/upset	1.64*	[1.49, 1.81]	0.43*	[0.26, 0.70]	1.13	[0.97, 1.31]	6.18*	[1.64, 23.30]	4.27*	[3.45, 5.28]
Mother sad/distressed	1.24*	[1.09, 1.41]	0.43*	[0.21, 0.89]	1.23*	[1.02, 1.49]	0.62	[0.08, 4.82]	0.62*	[0.44, 0.88]
Mother neutral	0.91	[0.82, 1.02]	2.79*	[1.95, 3.98]	1.15	[0.99, 1.34]	0.23	[0.03, 1.79]	0.41*	[0.31, 0.54]
Mother smile/positive affect	0.84*	[0.72, 0.98]	1.76*	[1.15, 2.70]	0.98	[0.80, 1.21]	0.62	[0.08, 4.83]	0.68*	[0.49, 0.96]
Focal ado frown/upset	1.11	[0.98, 1.25	1.64*	[1.10, 2.43]	0.97	[0.81, 1.17]	2.42	[0.71, 8.26]	2.66*	[2.16, 3.29]
Focal ado sad/distressed	1.18*	[1.05, 1.34]	1.16	[0.74, 1.81]	1.18	[0.98, 1.40]	N/A	N/A	0.56*	[0.40, 0.77]
Focal ado neutral	1.20*	[1.08, 1.33]	1.28	[0.88, 1.85]	1.34*	[1.16, 1.56]	0.24	[0.03, 1.90]	0.97	[0.78, 1.22]
Focal ado smile/positive affect	0.98	[0.87, 1.11]	0.83	[0.52, 1.33]	1.12	[0.95, 1.33]	2.28	[0.67, 7.78]	0.88	[0.79, 1.01]

Note. ado = adolescent; CI = confidence interval.
*$p < .05$.

mothers and adolescents disagreed less. Adolescents also avoided/withdrew less, whereas mothers avoided/withdrew more. Finally, following their smile/positive affect, mothers and adolescents disagreed less. Mothers also made fewer analytic remarks and avoided/withdrew more.

Adolescents' and mother's responses to their partners' emotions during mother-adolescent conflict. Following their partners' frown/upset affect, both mothers and adolescents disagreed more. Adolescents also made more confrontative remarks and avoided/withdrew less following their mothers' frown/upset affect, whereas mothers avoided/withdrew more following adolescents' frown/upset affect. Following their partners' sad/distressed affect, both mothers and adolescents disagreed less. Adolescents also avoided/withdrew more, whereas mothers made more analytic remarks. Following their partners' neutral affect, both groups made more analytic remarks. Adolescents also avoided/withdrew more and disagreed less following their mothers' neutral affect. Mothers made more conciliatory remarks following adolescents' neutral affect.

Objective 2

As stated above, Yule's Q values could only be calculated if both the given and the target behaviors occurred within the dyad's interaction. Missingness on Yule's Q variables ranged from 0.00% to 56.2%. Eight contingencies (*mother frown/upset → mother avoid/withdraw, mother sad/distressed → mother avoid/withdraw, adolescent frown/upset → mother avoid/withdraw, adolescent sad/distressed → mother avoid/withdraw, focal adolescent sad/distressed → focal adolescent avoid/withdraw, sibling sad/distressed → sibling avoid/withdraw, focal adolescent sad/distressed → sibling avoid/withdraw, sibling sad/distressed → focal adolescent avoid/withdraw*) were excluded from analyses because Yule's Q values could not be computed for >50% of the sample. Results of partial correlations are presented in Tables 3 to 7. Only statistically significant hypothesized correlations are described below.

Within-family similarity in responses to frown/upset affect. There was a pattern of statistically significant associations that was consistent with the hypothesis that family members would show similarities in their verbal behaviors following the expression of frown/upset affect. Table 3 shows results concerning the tendency to escalate following frown/upset affect. In mother-adolescent conflict, adolescents' tendency to escalate following their own frown/upset affect correlated positively with mothers' escalation following

Table 3. Partial Correlations Between Escalation Following Frown/Upset Affect Yule's Qs.

Variable	1	2	3	4	5	6	7
1. Mother FU → Mother Esc	—						
2. Ado FU → Ado Esc	.20	—					
3. Ado FU → Mother Esc	.15	.85***	—				
4. Mother FU → Ado Esc	.49**	.05	.13	—			
5. Focal Ado FU → Focal Ado Esc	.48*	.26	.45*	.71***	—		
6. Sibling FU → Sibling Esc	.18	–.31	.10	–.10	.00	—	
7. Sibling FU → Focal Ado Esc	.24	–.41	–.03	–.02	–.01	.38†	—
8. Focal Ado FU → Sibling Esc	.30	.15	–.14	.14	.39†	–.16	.10

Note. Ado = adolescent; FU = frown/upset affect; Esc = escalate.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 4. Partial Correlations Between De-Escalation Following Frown/Upset Affect Yule's Qs.

Variable	1	2	3	4	5	6	7
1. Mother FU → Mother De-esc	—						
2. Ado FU → Ado De-esc	.35*	—					
3. Ado FU → Mother De-esc	.20	.31†	—				
4. Mother FU → Ado De-esc	.17	–.17	.02	—			
5. Focal Ado FU → Focal Ado De-esc	.10	.17	.25	–.25	—		
6. Sibling FU → Sibling De-esc	–.27	–.42	.37†	.21	.58*	—	
7. Sibling FU → Focal Ado De-esc	.12	.27	–.08	–.16	.04	–.27	—
8. Focal Ado FU → Sibling De-esc	.02	.24	.24	–.17	.08	.56*	.12

Note. Ado = adolescent; FU = frown/upset affect; De-esc = de-escalate.
†$p < .10$. *$p < .05$.

Table 5. Partial Correlations Between Avoidance/Withdrawal Following Frown/Upset Affect Yule's Qs.

Variable	1	2	3	4	5
1. Ado FU → Ado AW	—				
2. Mother FU → Ado AW	.20	—			
3. Focal Ado FU → Focal Ado AW	–.01	.75**	—		
4. Sibling FU → Sibling AW	–.26	–.04	.26	—	
5. Sibling FU → Focal Ado AW	–.16	–.24	–.14	.70**	—
6. Focal Ado FU → Sibling AW	.11	.34	.49*	.24	–.20

Note. Ado = adolescent; FU = frown/upset affect; AW = avoid/withdraw.
*$p < .05$. **$p < .01$.

Table 6. Partial Correlations Between Escalation Following Sad/Distressed Affect Yule's Qs.

Variable	1	2	3	4	5	6	7
1. Mother SD → Mother Esc	—						
2. Ado SD → Ado Esc	–.20	—					
3. Ado SD → Mother Esc	.09	.64***	—				
4. Mother SD → Ado Esc	.65***	–.27	.01	—			
5. Focal Ado SD → Focal Ado Esc	–.20	–.10	–.17	.27	—		
6. Sibling SD → Sibling Esc	.33	–.43	–.53	.22	–.35	—	
7. Sibling SD → Focal Ado Esc	.52	–.33	–.22	.78*	–.49	.60*	—
8. Focal Ado SD → Sibling Esc	–.95*	.92**	–.50	–.59	.43	–.27	–.79*

Note. Ado = adolescent; SD = sad/distressed affect; Esc = escalate.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 7. Partial Correlations Between De-Escalation Following Sad/Distressed Affect Yule's Qs.

Variable	1	2	3	4	5	6	7
1. Mother SD → Mother De-esc	—						
2. Ado SD → Ado De-esc	–.08	—					
3. Ado SD → Mother De-esc	.27†	.37*	—				
4. Mother SD → Ado De-esc	–.47**	.05	–.03	—			
5. Focal Ado SD → Focal Ado De-esc	–.34	–.04	–.37	–.14	—		
6. Sibling SD → Sibling De-esc	–.47	–.26	–.34	.84**	.15	—	
7. Sibling SD → Focal Ado De-esc	.14	.28	.02	.41	–.85*	–.09	—
8. Focal Ado SD → Sibling De-esc	–.49	.01	–.39	–.13	–.26	–.35	.45

Note. Ado = adolescent; SD = sad/distressed affect; De-esc = de-escalate.
†$p < .10$. *$p < .05$. **$p < .01$.

their adolescents' frown/upset affect ($r = .85$, $p < .001$). Similarly, mothers' tendency to escalate following their own frown/upset affect correlated positively with adolescents' escalation following their mothers' frown/upset affect ($r = .49$, $p < .01$). Focal adolescents' tendency to escalate following their own frown/upset affect in the sibling conflict was positively associated with mothers' escalation following their own frown/upset affect ($r = .48$, $p < .05$), as well as with mothers' escalation following adolescents' frown/upset affect ($r = .45$, $p < .05$). Two trends emerged in the sibling task: (a) focal adolescents' tendency to escalate following their own frown/upset affect correlated positively with siblings' escalation following focal adolescents' frown/upset affect ($r = .39$, $p < .10$) and (b) siblings' tendency to escalate

following their own frown/upset affect correlated positively with focal adolescents' escalation following siblings' frown/upset affect ($r = .38, p < .10$).

Family members also showed similarities in de-escalation following frown/upset affect (see Table 4). In the mother-adolescent conflict, maternal de-escalation following their own frown/upset affect was positively correlated with adolescents' de-escalation following their own frown/upset affect ($r = .35, p < .05$). There was a trend in the association between adolescent de-escalation following their own frown/upset affect and maternal de-escalation following their adolescents' frown/upset affect ($r = .31, p < .10$). In the sibling task, focal adolescents' de-escalation following their own frown/upset affect correlated positively with siblings' de-escalation following their own frown/upset affect ($r = .58, p < .05$). Siblings' de-escalation following their own frown/upset affect was also associated with their de-escalation following focal adolescents' frown/upset affect ($r = .56, p < .05$), as well as with mothers' de-escalation following focal adolescents' frown/upset affect ($r = .37, p < .10$).

Further evidence of reciprocal exchanges was seen in avoid/withdraw responses to frown/upset affect during sibling conflict (see Table 5). Focal adolescents' avoid/withdraw responses to their own frown/upset affect was associated with sibling avoidance/withdrawal following focal adolescents' frown/upset affect ($r = .49, p < .05$). The reverse was also true: siblings' avoid/withdraw responses to their own frown/upset affect was associated with focal adolescent avoidance/withdrawal following siblings' frown/upset affect ($r = .70, p < .01$).

Within-family similarity in responses to sad/distressed affect. There was also a pattern of associations that was in line with the hypothesis that family members would behave similarly following sad/distressed affect. Results pertaining to escalation following sad/distressed affect again suggested a pattern of reciprocal exchanges (see Table 6). During mother-adolescent conflict, adolescent escalation following their own sad/distressed affect correlated positively with mothers' escalation following adolescents' sad/distressed affect ($r = .64, p < .001$). The reverse was also true: mothers' escalation following their own sad/distressed affect correlated with adolescents' escalation following mothers' sad/distressed affect ($r = .65, p < .001$). In the sibling task, sibling escalation following their own sad/distressed affect was positively correlated with focal adolescents' escalation following siblings' sad/distressed affect ($r = .60, p < .05$). There was also similarity between siblings, across tasks: focal adolescent escalation following their own sad/distressed affect during mother-adolescent conflict was associated with sibling escalation following focal adolescents' sad/distressed affect ($r = .92, p < .01$).

Family members also showed similarities in de-escalation following sad/distressed affect (see Table 7). During mother-adolescent conflict, adolescents' de-escalation following their own sad/distressed affect correlated positively with mothers' de-escalation following adolescents' sad/distressed affect ($r = .37$, $p < .05$). There was also a trend in the association between mothers' de-escalation following their adolescents' sad/distressed affect and their de-escalation following their own sad/distressed affect ($r = .27$, $p < .10$). Across tasks, adolescents' de-escalation following their mothers' sad/distressed affect was positively correlated with their siblings' de-escalation following their own sad/distressed affect ($r = .84$, $p < .01$).

Finally, there was evidence of within-person similarity in focal adolescents' avoidance/withdrawal responses to sad/distressed affect in the mother-adolescent task. Adolescents' avoidance/withdrawal following their own sad/distressed affect was associated with their tendency to avoid/withdraw following their mothers' sad/distressed affect ($r = .83$, $p < .001$). As described above, the other variables pertaining to avoidance/withdrawal following sad/distressed affect were excluded from analyses as Yule's Q values could not be computed for >50% of the sample.

Across-context similarity in focal adolescents' responses to negative affect. There was some limited support for the hypothesis that focal adolescents would respond similarly to negative affect in the two conflict contexts (i.e., mother-adolescent and sibling conflicts). First, adolescents' escalation following their mothers' sad/distressed affect and their escalation in response to their siblings' sad/distressed affect were positively correlated ($r = .78$, $p < .05$). Second, their escalation following their mothers' frown/upset affect and their escalation following their own frown/upset affect during the sibling conflict were positively correlated ($r = .71$, $p < .001$). Third, their avoidance/withdrawal following their mothers' frown/upset affect was associated with their avoidance/withdrawal following their own frown/upset affect during sibling conflict ($r = .74$, $p < .01$).

Discussion

The present study observed temporal relations between emotion and verbal behavior during early adolescents' conflict with their siblings and mothers. Results identified how, overall, adolescents, siblings, and mothers behave in response to their own and their partners' emotions. As well as supporting goal-based theories of emotion (Sanford, 2007; Stein & Levine, 1989), results pinpoint several aspects of conflict that appear unique to each type of relationship during early adolescence. In addition, within-family and

across-context similarities in responses to negative emotions were assessed. Findings provided evidence of congruence, suggesting that patterns of conflict behavior are shared within families (Buist et al., 2011; Noller, 2005).

Focal Adolescents' and Siblings' Behavior Following Their Own Affect During Sibling Conflict

This was the first study to identify moment-to-moment links between emotional expressions and behavior during sibling conflict. As hypothesized, focal adolescents' and siblings' behavior following their *own* negative affect was largely in line with goal-based theories of emotions (Sanford, 2007). First, both focal adolescents and siblings used more escalating behavior (disagreement, confrontation) and analytic remarks following angry (frown/upset) affect. Anger is experienced when individuals perceive that their goals are thwarted and that these goals can be reinstated. As such, it activates individuals' sense of agency and focuses attention and behavior toward reaching their goals (Stein & Levine, 1989). This can be done through either attack or assertive communication, as both types of behaviors can be seen as useful in reaching one's goals, depending on situational and personality factors (Canary, Spitzberg, & Semic, 1998). In either case, anger mobilizes individuals *toward* conflict, which explains why focal adolescents and siblings were also less likely to avoid or withdraw. This finding is consistent with Ferrar et al.'s (2020) study of mother-preadolescent conflict, suggesting that anger reduces avoidance across age groups and family relationships. Conversely, following sad affect, focal adolescents and siblings were more likely to avoid. Sadness is believed to motivate withdrawal from personal goals, replacing them with a desire to end conflict and repair relationship damage (Recchia & Howe, 2010; Stein & Levine, 1989). Indeed, siblings attempted more conciliation following expressions of sadness, although focal adolescents did not. As conflict is particularly intense during early adolescence, adolescents may be less inclined to attempt conciliation even when sad (Campione-Barr & Killoren, 2019). As the siblings had a broader age range, this could suggest that aside from the tense early adolescent period, children are indeed motivated by sadness to resolve sibling conflict amicably.

This study was also novel in its consideration of positive and neutral emotions in sibling conflict. The hypothesis that the most constructive behaviors would follow neutral affect was generally supported. Both groups used more conciliation following neutral affect, and focal adolescents also made more analytic statements and disagreed less. There is increasing evidence of the benefits of neutral affect in conflict resolution (Enns, 2013; Ferrar et al.,

2020). Although the expression of negative emotions is often necessary during conflict, intense negative affect interferes with problem-solving and perspective-taking (Guerrero, 2013; Moed et al., 2015). Thus, regulating these emotions facilitates effective communication. While this has been shown in other relationships, these findings demonstrate that similar processes are at play during sibling conflict. These results suggest that interventions aimed at reducing sibling conflict should promote the regulation of strong negative emotions, in order to help youth use their negative emotions to motivate resolution while preventing discussions from becoming hostile and destructive. Indeed, the intensity of conflict interactions is a key marker of sibling relationship quality (Killoren, De Jesús, Updegraff, & Wheeler, 2017).Over time, conflict becomes more destructive and emotionally charged when issues remain unresolved (Missotten, Luyckx, Branje, Hale, & Meeus, 2017). Thus, helping youth regulate negative emotions and discuss issues more calmly could decrease the negative interactions seen in more conflictual sibling relationships. As expected, both groups' positive emotions were linked to increased conflict avoidance. However, they did not seem to predict more constructive conflict resolution (Guerrero & Floyd, 2006). Siblings can rapidly shift from intensely positive to intensely negative interactions. Thus, positive affect during sibling conflict may function exclusively to lighten the mood and offer a break from intense conflict (Norrick & Spitz, 2008).

Focal Adolescents' and Siblings' Behavior Following Each Other's Affect During Conflict

In order to further understand how the emotional climate of sibling conflict influences behavior, relations between focal adolescents' and siblings' affect and their partners' behavior were examined. Overall, across both groups, patterns of youths' responses to their siblings' emotions were less consistent than their responses to their own emotions. This might be because sibships are highly variable and elicit a wide range of uninhibited affect and behavior, and as such, there may be important differences across families in how youth respond to their siblings' emotions (Furman & Buhrmester, 1985; Punch, 2008). Following their siblings' angry affect, both groups disagreed more, and the sibling group used more confrontation. Thus, links between sibling anger and conflict escalation are present, but are less pronounced than links with their own anger. This may be because siblings' anger sends a signal that they too have a perspective worth defending (Recchia & Howe, 2010; Van Bommel, Van der Giessen, Van der Graaff, Meeus, & Branje, 2019). The only relation between sad affect and partner behavior was that siblings used more confrontation following focal adolescents' sadness.

Instead of evoking sympathy, adolescent sadness may have been perceived as a chance for siblings to double down on their own personal efforts, "kicking them when they are down." Indeed, youth are more comfortable being aggressive with their siblings than with peers or parents, due to reduced risk of negative consequences (Campione-Barr & Killoren, 2019; Recchia et al., 2013). It is also possible that some adolescents display sadness as a way of attempting to sway their siblings and that over time their siblings have learned to see through this tactic and respond instead with increased confrontation. However, as this result was only found in the sibling group, interpretations should be made with caution.

In response to their siblings' neutral affect, both groups used more analytic behavior, and focal adolescents attempted more conciliation. These findings reinforce that a calm emotional climate can promote assertive and constructive communication. Conversely, both groups also avoided conflict more often following their siblings' neutral expressions. Passive strategies are particularly common during sibling conflict, and youth report that their disagreements are often left unresolved (Raffaelli, 1992; Recchia et al., 2010). It is perhaps unsurprising that they use their default strategy when their siblings appear neutral. Finally, only focal adolescents' behavior was linked to their siblings' positive affect, which elicited more analytic remarks and less disagreement. This suggests that by early adolescence, youth are encouraged by their siblings' positive affect to engage in constructive conflict resolution, as has been documented in adults interacting with their spouses and children (Guerrero & Floyd, 2006; Ferrar et al., 2020). The sibling group may not have shown this same pattern due to their wider age range, with some children preadolescent or younger. The fact that neither group responded to sibling positive affect with increased avoidance suggests that joking during conflict is an individual tactic used to defuse tense conflict, rather than a dyadic exchange coordinated between siblings.

Mother and Adolescent Behavior Following Their Own Affect During Conflict

Observing both sibling and mother-adolescent conflict in the same adolescents allowed for the comparison of behavior across contexts. As hypothesized, mothers' and focal adolescents' responses to their own negative affect were consistent with goal-based theories of emotions (Sanford, 2007; Stein & Levine, 1989). They used more conflict-escalating and assertive behaviors when angry, as well as less avoidance. Following sad affect, they made more conciliatory remarks and disagreed less, and adolescents avoided more. The roles of negative emotions during conflict thus appear robust across family

relationships and developmental periods (Guerrero, 2013; Ferrar et al., 2020; Recchia & Howe, 2010).

It was expected that neutral and positive affect would predict more constructive behaviors and that positive affect would also predict more avoidance. These hypotheses were only partially supported in the mother-adolescent context. Neither neutral nor positive affect were associated with increased analytic or conciliatory remarks. Between preadolescence and adolescence, mother-child conflict is characterized by increased negative affect and decreased positive affect (Laursen, Coy, & Collins, 1998; Seiffge-Krenke, Overbeek, & Vermulst, 2010). Thus, conflict resolution between mothers and adolescents may be primarily driven by negative emotions. However, adolescents avoided less following their own neutral affect, whereas mothers avoided more. This could reflect changes to youths' autonomy in early adolescence. As adolescents seek more independence (Hadiwijaya, Klimstra, Vermunt, Branje, & Meeus, 2017), they may be less likely to back down when discussing an issue that is important to them. Conversely, mothers may provide their adolescents increased autonomy by letting go of issues more easily (Darling, Cumsille, & Martínez, 2008). Of note, the two most commonly discussed topics were adolescents' responsibilities and socially appropriate behavior. Through the process of individuation, adolescents may come to perceive these issues as linked to their personal independence and self-exploration, as opposed to solely about responding to their mothers' attempts to elicit compliance (Smetana, 1989). Finally, mothers also avoided more following positive affect, but adolescents did not. Adolescents may be less willing to stray from conflict with their mothers to engage in humor, determined to have their goals addressed (Hofer et al., 2013). Given that youth undergo important cognitive maturation during adolescence, they may be more able to support their arguments in flexible and perseverant ways, allowing them to remain focused on addressing their goals (Branje, 2018).

Mother and Adolescent Behavior Following Their Partners' Affect During Conflict

With respect to mother and adolescent behavior following each other's negative affect, results generally supported hypotheses. That is, links between emotion and behavior were similar to, but less pronounced than links between their own emotions and behavior. Angry (frown/upset) affect predicted more escalating behavior in the other person. Sad affect predicted more constructive behavior (less disagreement, more analytic remarks), and in adolescents, more avoidance. Interestingly, whereas mothers' angry affect predicted less adolescent avoidance, adolescents' angry affect predicted more maternal

avoidance. These findings reinforce the argument that adolescents are driven *toward* conflict, keen on having their goals met, while mothers withdraw, allowing them this increased autonomy (Darling et al., 2008; Hadiwijaya et al., 2017). Alternatively, given that adolescents are less likely to withdraw from conflict when angry, their mothers may grow tired from frequent and prolonged exposure to their adolescents' expressions of anger, and over time begin responding with withdrawal.

As hypothesized, neutral affect predicted more constructive behavior in the other person, with both groups using more analytic remarks, adolescents disagreeing less, and mothers being more conciliatory. Adolescents also avoided more following maternal neutral affect, which could be due to mothers themselves avoiding when neutral, pulling the adolescents away from the discussion. Finally, no associations were found between positive affect and the other's conflict behavior. Negative interactions tend to have a greater impact than positive ones, and this may be especially true of mother-child conflict during this strained period, when negativity between mothers and children peaks (Baumeister et al., 2001; Laursen et al., 1998; Seiffge-Krenke et al., 2010).

Within-Family and Across-Context Similarity in Responses to Negative Emotions

Given the particular roles of negative emotion in conflict (Shantz, 1987; Shortt & Gottman, 1997), the second objective addressed whether focal adolescents' responses to negative emotional expressions were linked to those of their family members. Understanding how responses to negative emotions during conflict develop is important, as they are predictive of psychological adjustment (Moed et al., 2015; Ferrar et al., 2020). According to family systems theory, subsystems are tied to one other; however, the nature of these ties is not entirely clear (Minuchin, 2001, 1988). Results from the present study support the congruence hypothesis. Many positive associations between family members' responses to angry and sad affect emerged, both within interactions (e.g., similarity between siblings in the sibling conflict) and across relationships (e.g., similarity between maternal behavior in mother-adolescent conflict and adolescent behavior in sibling conflict). Several mechanisms can explain these similarities. From a social learning perspective, youth learn through observation and reinforcement, much of which occurs in the home (Bandura, 1977). Dynamic systems theorists argue that patterns of behavior develop through interactions with family members, and these interactions influence youths' behavior in other relationships (Hollenstein, 2013; Sameroff, 2009). When considering the role

of emotional interactions in particular, the spillover effect also comes into play. According to this perspective, negatively valenced interactions are transferred within the family. For example, escalation of negative emotion between an adolescent and their mother may color their attitudes toward the entire family, affecting their interactions with their siblings (Engfer, 1998; Low et al., 2019).

While these mechanisms help explain why behavior is similar between family members and across subsystems, it is important to stress that the cross-sectional nature of this study precludes assumptions on the direction of effects. Noller and colleagues' (Noller, 2005; Noller et al., 2000) model of interaction-based transmission posits that youth develop their conflict styles through parent-child conflict, which they then transfer to conflict with their siblings. However, sibling interactions could also spill into parent-child relationships, especially since parents often intervene in sibling disputes (Persram et al., 2019). Longitudinal studies of both parent-child and sibling conflict are needed to clarify how within-family transmission occurs.

An unanticipated yet consistent finding was that many of the within-family associations involved reciprocal patterns of behavior when one individual displayed a negative emotion. For example, focal adolescents' tendency to avoid when angry was associated with their siblings' tendency to avoid when the focal adolescents were angry, and the reverse was also true. Similarly, adolescents' escalation when they appeared sad correlated with mothers' escalation when the adolescents were sad, and the opposite association also emerged. Proponents of dynamic systems argue that repeated reciprocal exchanges absorb dyads, limiting their ability to act in ways that would shift their interaction in a new direction (Hollenstein, 2013). Certain cycles are especially problematic, such as when both individuals continuously escalate the conflict when upset, in an effort to overpower the other (Moed et al., 2015). Reciprocated negative emotional exchanges within the family are linked to social problems, suggesting that youth internalize maladaptive exchanges and apply them to interactions outside the family (Compton, Snyder, Schrepferman, Bank, & Shortt, 2003; Patterson, 1980). Coercive cycles are thought to become particularly ingrained when they occur in multiple family subsystems (Bank et al., 2004), and this might often be the case, given that within-family similarities also spanned across relationships. Further research is needed to better understand how conflicts unfold in a bidirectional manner over the course of interactions to lead to the up- or down-regulation of emotions and behaviors, and how these processes may then culminate in the development of absorbing (and potentially coercive) cycles.

Despite considerable evidence for congruence between family members, only a few across-context associations in focal adolescents' responses to

negative emotions emerged. First, adolescents who tended to escalate conflict when their mothers appeared sad also tended to escalate when their siblings appeared sad. Second, adolescents' tendency to escalate following their mothers' angry affect was associated with their tendency to escalate following their own angry affect during sibling conflict. Third, avoidance following their mothers' angry affect was associated with avoidance following their own angry affect during sibling conflict. Thus, consistent with self-report studies, some of focal adolescents' conflict patterns generalized across family relationships (Noller et al., 2000). However, the low number of associations indicates that overall, early adolescents act differently depending on with whom they are interacting. Results from the first objective suggested that adolescents are particularly motivated to engage in conflict with their mothers when the emotional climate is negative, perhaps because at this age, they are challenging parents' authority (Hadiwijaya et al., 2017; Van Bommel et al., 2019). Conversely, their interactions with their siblings were more constructive when interactions were neutral and positive. Increasingly egalitarian sibling relationships may lend themselves to a greater use of tactics needed to resolve conflict in peer and romantic relationships (Laursen, Finkelstein, & Betts, 2001; Recchia et al., 2013). This reinforces the idea that sibling interactions are particularly important for the development of social skills needed for relationships outside the family (DeHart, 1999). Differences in focal adolescents' behavior across family relationships thus highlight the need for increased attention to sibling relationships and their unique role in adolescent development. In particular, further research is needed to better understand how the different power structures within these relationships help explain conflict patterns across mother-adolescent and sibling conflict (Recchia et al., 2010).

Limitations and Directions for Future Research

Alongside several contributions, the results of the present study should be considered in light of certain limitations. Although observational data allows for effective sequential analysis of small samples, it would be beneficial to replicate these findings in a larger sample, and to consider the role of individual characteristics. For instance, power constraints precluded comparisons of sibling dyads based on gender constellation. That said, the influence of gender constellation in sibling interactions has been inconsistent in the literature, with many studies of conflict behavior finding no effects (Campione-Barr & Killoren, 2019; Recchia & Howe, 2010). Second, as the adolescent sample was drawn from a larger project, their siblings' ages could not be controlled as systematically as studies that target pairs with specific ages. Although the impacts of age and birth order decrease with age, some

studies of adolescent conflict have found differences; thus, future studies should consider this possibility (Campione-Barr et al., 2014; Killoren et al., 2008). As the participants in the present study were drawn from primarily Caucasian French-Canadian families, the present findings may not generalize to families with other cultural backgrounds, where values of independence versus interdependence may differ. Thus, the field would benefit from cross-cultural research on the interplay between emotion and behavior during conflict. In addition, conflict discussions were limited to mother-child and sibling dyads. It would be valuable to apply the present methodology to interactions including fathers, as well as to triadic or whole-family observations (Della Porta, Howe, & Persram, 2019; Persram et al., 2019). Every family member contributes to the dynamics within the home, and the place of fathers in these dynamics remains understudied (Little, Germeroth, & Garber, 2019; Ravindran, Hu, McElwain, & Telzer, 2019). Finally, as mentioned earlier, the direction of associations could not be identified using the present cross-sectional design; studies that combine longitudinal and observational methods are needed to clarify this point. This design would also permit researchers to assess how patterns of sibling conflict predict youths' socioemotional functioning over time.

Together, results from the present study significantly advance our knowledge of sibling conflict in adolescence as well as its links to parent-adolescent conflict. The observational and sequential design allowed for a thorough investigation into how family members engage in conflict, in relation to the emotional climate of the interactions. Results demonstrate that some associations between emotion and behavior appear across contexts, likely reflecting basic psychological phenomena (e.g., a tendency to approach conflict when angry and to withdraw when sad). Conversely, conflict patterns also show important differences depending on the type of relationship. Furthermore, findings contribute to family systems research, showing that family members are similar in their responses to negative emotion during conflict, whereas adolescent behavior is not necessarily consistent across relationships. Overall, results from this study provide an in-depth understanding of typical family conflict to which high-risk and clinical samples can be compared and can help identify targets for clinical intervention. In particular, similarities between family members suggest that when addressing inherently social difficulties such as destructive conflict, family interventions may provide the best possible results.

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