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## Deviant peers and adolescent risky behaviors: the protective effect of nonverbal display of parental warmth

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Risk-taking is common during adolescence, but an important distinction is whether the risky behaviors persist over time or diminish. A key factor in adolescents' risky behavior trajectories is their choice of friends. Adolescents who engage in risky behaviors tend to seek out and affiliate with similarly-minded friends (Osgood et al., 2013) and, in turn, affiliation with deviant peers further increases the likelihood of risky behaviors (Leung, Toumbourou, & Hemphill, 2014). This bidirectional reinforcing cycle can evolve into more severe and pervasive patterns of risk-taking and pose a danger to adolescents' emotional and physical health (Eaton et al., 2011). Yet, some adolescents reduce their risky behaviors over time (Mustanski et al., 2013), which highlights the importance of identifying factors that disrupt trajectories involving deviant peers and risky behaviors.

Parental monitoring and support are two such factors found to have direct effects on adolescents' involvement in risky behaviors (Hoeve et al., 2009) and their affiliation with deviant peers (Goldstein, Davis-Kean, & Eccles, 2005). However, questions remain whether supportive parenting simply lowers the overall likelihood of risky behaviors or actually disrupts bidirectional pathways across time between deviant peers and risky behaviors. In addition, it is important to identify what aspects of positive parenting interrupt this reinforcing cycle (Pardini, Waller, & Hawes, 2015). To address these questions, we examined how observed nonverbal parental warmth during an in-lab family conflict discussion moderates bidirectional associations across several years between affiliation with deviant peers and risky behaviors. We focused on observed parental warmth specifically during a conflict discussion for two reasons: (a) to obtain an objective assessment of parental warmth as contrasted with either parent or child report; and (b) to assess this important

parenting dimension while the parents and child are dealing with hot button issues. The specific aim of this study is to investigate the role of observed parental warmth during an in-lab conflict discussion between parents and their adolescent child as a buffer for trajectories between adolescent risky behaviors and affiliation with deviant peers.

## Deviant Peers and Risky Behaviors

The connection between risky behaviors and deviant peers has been explained by two processes: the *selection* effect and the *influence* effect. The *selection* effect refers to the tendency of youths to affiliate with peers that are similar to themselves (Osgood et al., 2013). That is, adolescents seek out groups of friends where they feel they belong in order to promote identity development and self-esteem (Tajfel & Turner, 1986). The selection effect explains why adolescents who engage in more risky behaviors are prospectively more likely to affiliate with deviant peers. The *influence*, or socialization, effect refers to the process by which adolescents follow the lead of their friends; that is, they are more likely to engage in risky behaviors when affiliating with deviant friends (Hoeben, Meldrum, & Young, 2016). This influence of peers emerges even after controlling for selection effects and adolescents' own previous risky behaviors (Maxwell, 2002; Reitz, Dekovi, Meijer, & Engels, 2006).

In a handful of prospective longitudinal studies, both directions for the association between affiliation with deviant peers and engagement in risky behaviors have been examined. Most of these studies show evidence of reciprocal influences between peers and adolescents' own behaviors with respect to alcohol use (Simons-Morton & Chen, 2006), substance use, (Schaefer, Haas, & Bishop, 2012), and delinquency (Baerveldt, Völker, & Van Rossem, 2008), while others have supported one direction of effect, either the influence (Reitz et al., 2006) or the selection effect (De Kemp, Scholte, Overbeek, & Engels, 2006). The relative strength of the socialization and selection effects is therefore unclear and might differ with varying types of risky behaviors (Kiuru, Burk, Laursen, Salmela-Aro, & Nurmi, 2010). Moreover, beyond the question pertaining to the reciprocal influence of deviant peers and risky behaviors, one recent systematic review (Leung et al., 2014) concluded that potential moderators that could mitigate the influence and selection effects, such as parental factors, are currently understudied.

## The Buffering Effect of Supportive Parenting

Despite the growing influence of peers during adolescence (Stanton et al., 2002), parenting plays a role in adolescents' risk-taking and affiliation with deviant peers (Hoever et al., 2009). The influence of various parenting practices on adolescents' friendship quality, friendship intimacy and affiliation with deviant peers is well documented (see Brown & Bakken, 2011, for a review). For instance, Brody et al. (2001) found that whereas harsh and inconsistent parenting was positively associated with affiliation with deviant peers, nurturing and involved parenting was negatively associated with affiliation with deviant peers, over and above neighborhood factors. Other forms of parenting—including affection, communication, warmth, and monitoring—also have been inversely related to affiliation with deviant peers (De Kemp et al., 2006; Goldstein et al., 2005). A similar influence of positive parenting practice has been found with respect to adolescents' involvement in risky

behaviors (De Kemp et al., 2006; Guilamo-Ramos et al., 2012; Hoeve et al., 2009; Nogueira Avelar e Silva, van de Bongardt, van de Looij-Jansen, Wijtzes, & Raat, 2016) and has been attributed to less dependency on peers, more acceptance of parental values, and the fostering of adolescents' emotion regulation (McAdams et al., 2017; Pardini et al., 2015).

However, the literature on the buffering role of parenting in links between risky behaviors and deviant peers is somewhat mixed and primarily investigates one direction—from affiliating with deviant peers to risky behaviors. For example, longitudinal studies conducted with pre- to early adolescents showed that positive parenting and parent-child relationships mitigate the influence of peers on various types of risky behaviors (Jaccard, Blanton, & Dodge, 2005; Vitaro, Brendgen, & Tremblay, 2000). Similarly, in a sample of Chinese adolescents, low family conflict and high parental concern and caring lessened the association between affiliation with deviant peers and delinquency (Gao, Yu, & Ng, 2013). Related literature shows that nurturant/involved parenting moderates associations from neighborhood environment to deviant peers affiliation (Brody et al., 2001). Finally, a buffering effect of family cohesion has been observed on the association between best friends' alcohol use and adolescent binge drinking (Soloski, Kale Monk, & Durtschi, 2016). Several studies, in contrast, do not show a buffering effect of supportive parenting (De Kemp et al., 2006; Trucco, Colder, & Wieczorek, 2011) on risky behaviors and one study found that parental warmth actually increased the link between gang involvement and substance use (Walker-Barnes & Mason, 2004). These conflicting findings indicate that the influences of positive parenting on adolescents' adjustment vary; sex differences in parents and youth are factors that potentially contribute to this variability.

## Sex Differences in the Protective Role of Parents

Taking into account adolescents' sex helps to clarify the inconsistent results, as some studies suggest that parental support may be protective for girls while actually exacerbating deviant behaviors in boys. For instance, Marshal and Chassin (2000) found that parents' support buffered the impact of peer group affiliation on alcohol use in girls, but had the opposite effect on boys. Similarly, parental involvement exacerbated best friends' influence on adolescent tobacco and alcohol use in boys, but protected against illegal drugs use in girls (Henneberger, Durkee, Truong, Atkins, & Tolan, 2013). Moreover, contrary to expectation, family cohesion appeared to strengthen the association between deviant peers and adolescent delinquency in boys (Henneberger et al., 2013). Though explanations are not entirely clear, the impact of different forms of parental support seems to vary across male and female adolescents.

Sex differences with respect to parents are also observed in previous research. Both mothers' and fathers' support are independently associated with adolescents' lower levels of risky behaviors (Boyd, Ashcraft, & Belgrave, 2006; Nogueira Avelar e Silva et al., 2016). However, when it comes to buffering the negative impact of peers on adolescent risky behaviors, the relative influence of mothers and fathers is unclear. Marshal and Chassin (2000) found that both fathers' and mothers' support reduced the influence of peer group affiliation on adolescent girls' alcohol use. Both fathers' and mothers' effective parenting also protected against boys' conduct problems in the context of low affiliation with deviant

peers (Trudeau, Mason, Randall, Spoth, & Ralston, 2012). However, fathers and mothers may sometimes exert differential influences. In two studies, positive mother-child relationships moderated the influence of peers on adolescent substance use but no effect emerged for positive father-child relationship (Brook, Brook, Gordon, Whiteman, & Cohen, 1990; Farrell & White, 1998). Conversely, according to Dorius, Bahr, Hoffmann, and Harmon (2004) closeness to fathers, but not closeness to mothers, moderates the association between peer drug use and adolescents' marijuana use. In addition, fathers' but not mothers' effective parenting buffered the association between deviant peers and girls' conduct problems during the transition to high school (Trudeau et al., 2012). These findings underline the importance of addressing sex differences of both youth and parents, which contribute to mixed and sometimes complicated results.

## Present Study

The current investigation expands upon past research in several important ways. First, the protective role of positive parenting has been exclusively examined in the association from deviant peers to risky behaviors, thus testing the influence effect. To our knowledge, it is still unknown whether positive parenting moderates prospective links from risky behaviors to affiliation with deviant peers — a hypothesized risky pathway via the selection effect. Second, we examined displays of warmth during in-lab conflict discussions about hot-button issues between parents and youth, a context where parents' warmth might be particularly potent. The focus on warmth adds a new perspective to prior aggregation of a number of parenting dimensions, e.g. support, positive affect, and uniquely focuses on nonverbal behaviors that are central to intimacy and closeness (Andersen, Guerrero, & Jones, 2006) as well as parent-child attachment (Ainsworth, Blehar, Waters, & Wall, 1978; Becker-Stoll, Delius, & Scheitenberger, 2001). Third, we used direct observation to assess parenting behaviors. Past studies have mainly measured parenting behaviors using youths' or parents' report, which conveys global, non-situationally specific perceptions (Hoeve et al., 2009). Though overall perceptions of parenting are useful, they do not reveal the tone of the parent-child relationship when dealing with thorny issues that are sources of disagreement. In addition, self-reports of parenting behaviors are susceptible to bias of self-perception and social desirability (Bornstein et al., 2015). The direct observation of parent-adolescent interactions—particularly during negative, emotionally-charged discussions—provides an objective, standardized, and authentic alternative for assessing parenting warmth. Direct observation of family interactions also has the advantage of objectively capturing more complex interpersonal behaviors (Margolin et al., 1998), such as nonverbal warmth during a conflict discussion, which would be difficult, if not impossible to assess through questionnaire data.

In the current study, we investigated whether the warmth that fathers and mothers display to their adolescent child during an in-lab family conflict mitigates bidirectional, longitudinal associations between affiliating with deviant peers and adolescents' own risky behaviors, controlling for autoregressive effects of risky behaviors and deviant peers. Figure 1 displays all relevant pathways. We assessed affiliation with deviant peers and youth's own risky behaviors at two points in time — mid-adolescence (T1) and approximately three years later (T2). We assessed the moderators — fathers' and mothers' observed warmth during a family

discussion with their adolescent child at T1. First, we tested the direct pathways. We hypothesized (HO1) that affiliation with deviant peers and risky behaviors would show continuity across time (paths a and b). We also hypothesized that deviant peers and risky behaviors would show bidirectional influences over time (HO2), even after controlling for concurrent associations and autoregressive paths. Specifically, we expected that having more deviant peers at T1 would be positively associated with engaging in more risky behaviors at T2 (path c) and, engaging in more risky behaviors at T1 would be positively associated with affiliation with deviant peers at T2 (path d). We then investigated whether fathers' and mothers' warmth toward the youth during an in-lab conflict discussion moderated these associations. We expected that adolescents receiving more warmth would show weaker continuity across time (paths e and h) as well as weaker bidirectional influences (paths f and g) between deviant peers and risky behaviors (HO3). In these models, we also investigated youth sex differences. Based on previous research (Marshall & Chassin, 2000; Trudeau et al., 2012), we predicted that parental warmth would buffer girls' risky trajectories more than boys' (HO4). We also separately tested fathers' and mothers' warmth, as previous studies (e.g. Dorius et al., 2004; Trudeau et al., 2012) report differential and mixed findings depending on parents' sex. Finally, we controlled for parental monitoring given the prior research documenting its association with deviant peers and risky behaviors (Hoeve et al., 2009; Véronneau & Dishion, 2010).

## Method

### Overview

Participants for the current study come from the fourth and fifth waves (referred to here as T1 and T2) of a larger prospective, longitudinal study on the role of family interactions on youth's adjustment (for more details, see Margolin, Vickerman, Oliver, & Gordis, 2010). A community-based sample was recruited through flyers, advertisements and word of mouth at two time points (waves 1 and 3). To be eligible for the original study, both parents (or other significant parental figures) and the child had to be residing together for at least three years and be able to complete the procedures in English. Each study wave was approved by the Institutional Review Board of the University of Southern California.

### Participants

Participants included 107 adolescents and their parents with data from two time points: Wave 4 (T1), when the youth were in mid-adolescence ( $M_{age} = 15.33$ ;  $SD = .71$ ), and Wave 5 (T2), when they were in late adolescence ( $M_{age} = 18.14$ ;  $SD = 1.13$ ). Of the 169 families invited to participate in T1, 140 engaged fully or partially in the procedures (e.g., completing online questionnaires) and 126 families participated in the lab assessment, which included the video-recorded parent-adolescent family discussion. Difficulties with video equipment ( $n = 10$ ) or missing questionnaire data at T1 or T2 ( $n = 9$ ) resulted in a final sample of 107 adolescents (46.7% female). Tests of selective attrition between participants who were included in the current analyses and those who did not participate in the laboratory-based wave 4 procedures showed no significant differences on demographic variables (age, sex, race/ethnicity, family income and parent's education) or on variables of interest (T1 deviant peers or risky behaviors). Eighty-eight of the 107 participants included in the study at T1

also engaged at T2. Comparisons between those who did and those who did not engage at T2 revealed no differences in demographic variables or in T1 deviant peers, risky behaviors, fathers' and mothers' warmth toward the youth, and parental monitoring.

The sample was ethnically diverse with 32.7% participants identifying as Hispanic/Latino. Regarding race, 53.3% of adolescents self-identified as Caucasian, 19.6% as Black or African American, 8.4% as Asian, 0.9% as Native American, and 17.8% identified with more than one race. Annual family income was less than \$40,000 for 11.5%; 30.8% reported between \$40,000 and \$80,000, 21.2% between \$80,001 and \$120,000, and 36.5% reported more than \$120,000 (Median = \$95,000). Parents' education ranged from 7 to 20 years with a mean of 15.48 ( $SD = 2.41$ ) for fathers and of 15.16 ( $SD = 2.43$ ) for mothers. Both the father and the mother participated in the T1 discussion in 89% of the cases ( $n = 95$ ); the father only participated in 3% of the cases ( $n = 3$ ) and the mother only participated in 8% of the cases ( $n = 9$ ). Overall, 98 fathers and 104 mothers engaged in the discussion. No significant differences regarding father or mother warmth, affiliation with deviant peers, and risky behaviors were observed between adolescents who engaged in the triadic discussion with both of their parents versus those who engaged in a discussion with one parent.

## Procedures

Before the lab visit, family members completed online questionnaires regarding risky behaviors of the adolescent and her or his peers, and parental monitoring. Next, they attended a 4-hour lab assessment during which they engaged in a triadic conflict discussion task, or if only one parent was present, a dyadic discussion. Prior to the discussion, participants were presented with a list of 33 common family issues and asked to rate whether and to what extent each issue is a source of conflict between the parents and adolescent youth and/or between the two parents. Experimenters next met individually with each of the family members to identify the most upsetting topics and to prime each family member to express their positions on these issues. Experimenters then conferred with each other to identify the three most upsetting topics across the family members. After the family members reconvened, they engaged in a 15-minute discussion in which they discussed one or more of the identified topics toward the goal of achieving better resolution of the issues; they were encouraged to express their individual points of view. The ecological validity of the discussions was assessed by having youth rate how similar this discussion was to other family discussions: 55.2% rated "moderately similar" or "very similar"; 28.6% rated "somewhat similar"; and 16.2% rated "slightly" or "not at all similar". Approximately three years later, the youth were re-contacted and invited to participate in the next wave of data collection, which included self-reports of risky behaviors and deviant peers.

## Measures

**Parents' displays of warmth during the in-lab family discussion**—Fathers' and mothers' nonverbal displays of warmth toward the youth during the in-lab conflict discussion were coded using the Triadic Global Coding System (Ramos, Rodriguez, & Margolin, 2009). Nonverbal displays of warmth included any behaviors that communicated affection or support such as positive facial expressions as well as reaching out and touching the youth, smiling at the youth, leaning in, and so on. Video-recordings of each 15-minute

family conflict discussion were segmented into five 3-minute intervals. Two trained coders independently rated behaviors in each 3-minute segment on a 4-point scale ranging from 0 (*not at all*) to 3 (*a lot*), according to the extent to which warmth was observed. We averaged the ratings across coders within each segment, and then averaged across the five segments to obtain a total score of warmth across the discussion. Separate scores were computed for fathers' and mothers' warmth. Intraclass coefficients for interrater reliability were .81 for fathers' warmth and .82 for mothers' warmth. Overall, 78% of fathers and 78% of mothers displayed warmth at least once during the discussion. No significant difference was found between fathers' and mothers' mean warmth ( $M = .46$ ,  $SD = .42$  for fathers' warmth and  $M = .42$ ,  $SD = .41$  for mothers' warmth),  $t(93) = -1.08$ ,  $p = .285$ .

**Risky behaviors**—At both T1 and T2, adolescents reported on risky behaviors during the prior year using a modified version of the CDC Youth Risk Behavior Surveillance Questionnaire (YRBS; Brener et al., 2004). We used questions from the YRBS to assess four types of risky behaviors: substance use (e.g., marijuana, ecstasy, prescription drugs, etc.), risky sex (e.g., having sex without using a male condom), aggressive delinquency (e.g., carrying a weapon) and non-aggressive delinquency (e.g., purposely taking something from a store without paying). Because response scales differed across items, e.g., some rated on a scale ranging from 0 (*0 times*) to 5 (*more than 20 times*) and others rated on a scale ranging from 0 (*0 days*) to 5 (*40 or more days*), all items were Z-scored. We then computed the mean across all Z-scored items to obtain a global score, with higher scores indicating more risky behaviors during the past year. As often happens in longitudinal studies and to capture a greater variety of risky behaviors that apply at an older age, different versions of the questionnaires were used at T1 (17 items,  $\alpha = .82$ ) and T2 (30 items,  $\alpha = .86$ ). At both time points, the most commonly endorsed item was drinking alcohol (32.7% at T1 and 60.0% at T2).

**Deviant peers**—Affiliation with deviant peers was assessed with a modified version of the Peer Behavior Inventory (PBI; Prinstein, Boergers, & Spirito, 2001). At T1, adolescents responded to a 13-item questionnaire ( $\alpha = .91$ ) with the prompt “how many kids do you know who...”, for example, tag or do graffiti, use marijuana, etc. The 5-point response scale ranges from 0 (*None*), 2 (*A few*), 4 (*Most*). At T2, the prompt “How many of your friends” preceded 20 questions ( $\alpha = .91$ ) and the 5-point response scale ranged from 0 (*None*), 2 (*A few*), 4 (*Almost all*). At both time points, the total score was the mean across items.

**Covariates**—Data regarding youth sex and age at T1 were gathered via a phone screening. Parental monitoring was assessed at T1 with four parallel items (e.g. “I know who my child’s friends are” and “I know where my child is when s/he is not at home”) for each parent and the adolescent on a comprehensive parenting questionnaire developed for this study (Child and Parent’s View; Margolin, 2000). All reporters rated each item on a scale ranging from 0 (*never*) to 4 (*always*). Scores were averaged across items for fathers ( $M = 3.12$ ,  $SD = .53$ ), mothers ( $M = 3.39$ ,  $SD = .47$ ), and adolescents ( $M = 2.97$ ,  $SD = .71$ ). To avoid redundant analyses and maximize the validity by using multiple reporters, the total score for parental monitoring represents the mean score on each item across the three

reporters and the mean of the four items. The intraclass correlation coefficient for interrater reliability was .77.

### Analytic Plan

Study variables were screened for outliers (1.4% of the total number of data points) and extreme scores were winsorized to a value of 3 *SD* above the mean (Ruppert, 2006). Because affiliation with deviant peers and risky behaviors are naturally non-normally distributed, we used the Maximum Likelihood Robust method of estimation (Yuan & Bentler, 2000).

We tested hypotheses using Mplus version 6.12 (Muthén & Muthén, 1998-2017). First, we conducted a cross-lagged model to examine continuity (HO1) and bidirectional influences (HO2) between deviant peers and risky behaviors over time. Sex differences were explored using multi-group analyses. Second, we tested the moderation effects of fathers' and mothers' warmth during an in-lab conflict discussion on the prospective associations between deviant peers and risky behaviors (HO3) in separate multiple regression models, for both theoretical and sample size considerations. In models that examined the effect of deviant peers at T1 on either deviant peers or risky behaviors at T2, we also adjusted for risky behaviors at T1. Similarly, models that examined the effect of risky behaviors at T1 on either deviant peers or risky behaviors at T2 adjusted for deviant peers at T1. This strategy ensured that autoregressive associations between T1 and T2 variables were taken into account in every model. All continuous predictors and covariates were mean centered prior to the analyses and the sex variable was coded as follows: 0 (*Female*), 1 (*Male*). In multiple regression models, sex differences were investigated by including sex as a moderator of both the main effects and the interaction (HO4). When the three-way interaction with sex was nonsignificant, it was dropped from the model. When the three-way interaction was significant, the model was conducted separately for male and female adolescents to isolate the effects. Parallel models were run to investigate the buffering role of fathers' and mothers' warmth. In models examining the moderation effect of fathers' warmth, we controlled for the main effect of mothers' warmth. Conversely, in models examining the moderating effect of mothers' warmth, we controlled for the main effect of fathers' warmth. Because in some families only the father or the mother engaged in the in-lab discussion, we determined which cases were included in the analyses based on whether the parent engaged in the in-lab discussion. Thus, in models where fathers' warmth was the moderator, we included only participants for whom the father engaged in the in-lab procedure ( $n = 98$ ). However, we handle missing data on mother's warmth (as a covariate) using the Full Information Maximum Likelihood estimation. Similarly, in models where mother's warmth was the moderator, we included only participants for whom the mother engaged in the in-lab discussion ( $n = 104$ ) and handled missing data on father's warmth. Age, family income, and parental monitoring were also examined as covariates. Because they did not change the significance or the direction of the effects in any of the analyses, they were dropped from the final models for parsimony. Significant interactions were plotted with simple slopes represented at values of 1 *SD* above and 1 *SD* below the mean of fathers' and mothers' warmth.



## Results

### Descriptive Analyses

Table 1 presents intercorrelations as well as means and standard deviations for the study variables. Deviant peers and risky behaviors were positively correlated, both within and across time points ( $r = .42 - .73$ ). Both fathers' and mothers' warmth were negatively correlated with risky behaviors at T1 but only fathers' warmth was significantly correlated with risky behaviors at T2. Parental monitoring was inversely related to risky behaviors at T1 and T2 and to deviant peers at T1, as well as positively related to fathers' and mothers' warmth. Results also suggested that older participants at T1 were more likely to affiliate with risky friends and engage in risky behaviors at T1, and were less likely to experience warmth from their fathers. Female adolescents received significantly more warmth from their fathers in comparison to male adolescents,  $t(95) = 2.07, p = .042$  ( $M = .57, SD = .47$  and  $M = .39, SD = .35$ , respectively). No differences emerged between male and female participants for mothers' warmth or for deviant peers and risky behaviors at each time point.

### Prospective Associations between Affiliation with Deviant Peers and Risky Behaviors

We conducted a cross-lagged model examining the associations between deviant peers and risky behaviors within the same time point and across time. In support of HO1, deviant peers and risky behaviors showed significant autoregressive paths from mid- to late adolescence,  $b = .35, p < .001$  and  $b = .37, p < .001$ , respectively. In partial support of HO2, and beyond concurrent associations at T1 ( $b = .21, p < .001$ ) and T2 ( $b = .12, p < .001$ ), cross-lagged associations showed that affiliation with deviant peers at T1 was associated with later T2 involvement in risky behaviors,  $b = .15, p = .013$ . However, the opposite effect did not emerge; risky behaviors in mid-adolescence were not related to affiliation with deviant peers in late adolescence,  $b = .26, p = .124$ .

Multi-group analyses exploring the role of participants' sex were conducted by comparing a model with freely estimated parameters across male and female adolescents with a model that includes equality constraints on correlations and regression paths across sex. The non-significant chi-square difference test,  $\chi^2 = .77, p = .99$ , suggested no sex differences in the longitudinal associations between deviant peers and risky behaviors. The constrained model showed an excellent fit to the data,  $\chi^2 = .77, p = .99$ , CFI = 1.00, TLI = 1.09, RMSEA = .00 with 90% CI [.00, .00].

### Moderation Effect of Fathers' and Mothers' Warmth

Table 2 presents the regression analyses for eight separate models examining the moderation effect of fathers' (left half of the table) and mothers' (right half of the table) warmth on the prospective associations between affiliation with deviant peers and risky behaviors (HO3). Sex of the adolescent was included as a moderator in all models (HO4). Boxes in Table 2 highlight significant interactions that are further decomposed. Age, family income and parental monitoring did not change the significance or the direction of the results and thus were dropped from the models.

Model 1 examined the moderation effect of fathers' and mothers' warmth on the prospective link from T1 deviant peers to T2 deviant peers and Model 2 is an analogous model for T2 risky behaviors. Both models suggested a significant interaction between deviant peers and fathers', but not mothers', warmth on the paths from T1 deviant peers to T2 deviant peers and T2 risky behaviors. Sex did not emerge as a significant moderator. Figure 2 presents plots of the associations between T1 deviant peers and T2 deviant peers (panel a) and T2 risky behaviors (panel b) at high (+1SD) and low (-1SD) levels of fathers' warmth. Simple slopes indicated that the association between T1 and T2 deviant peers was lower for youth exposed to high levels of fathers' warmth compared to those exposed to low fathers' warmth. Results also suggested that mid-adolescents' affiliation with deviant peers predicted risky behaviors in youth exposed to low but not high levels of fathers' warmth.

Models 3 and 4 present the moderation effects when T1 risky behaviors are linked to T2 deviant peers and T2 risky behaviors, respectively. Both models showed significant moderation effects for fathers', but not mothers', warmth on the paths from T1 risky behaviors to T2 deviant peers and T2 risky behaviors. Results of Model 3 indicated that fathers' warmth, but not mothers' warmth, moderated the association between T1 risky behaviors and T2 deviant peers. There also was a significant three-way interaction between T1 risky behaviors, fathers' warmth, and sex. The parallel three-way interaction with mother's warmth was not significant and was therefore dropped from the model. Similarly, Model 4 analyses testing moderation of the path from T1 risky behaviors to T2 risky behaviors showed a significant three-way interaction with sex for fathers' warmth but not for mothers' warmth. The nonsignificant three-way interaction was therefore dropped from this model. To deconstruct the significant three-way interactions, we conducted separate analyses for male and female participants to test how the T1 risky behaviors-fathers' warmth interaction influenced T2 deviant peers and T2 risky behaviors, respectively. For female participants only, there was an interaction between T1 risky behaviors and fathers' warmth to predict both T2 deviant peers,  $b = -1.86, p = .002$ , and T2 risky behaviors,  $b = -1.22, p = .002$ . Figure 3 presents the simple slopes for these analyses for T2 deviant peers (Figure 3a) and T2 risky behaviors (Figure 3c). Simple slopes showed that, for female adolescents who experience high warmth from fathers, T1 risky behaviors were associated with low T2 deviant peers and unrelated to T2 risky behaviors. Simple slopes for low fathers' warmth indicated that T1 risky behaviors were unrelated to T2 deviant peers but positively associated with T2 risky behaviors. For male adolescents, the interaction between T1 risky behaviors and fathers' warmth was not significant (see Figures 3b and 3d) in predicting T2 deviant peers,  $b = .16, p = .782$  or T2 risky behaviors,  $b = .19, p = .512$ .

## Discussion

In the current study, we prospectively examined bidirectional associations between affiliation with deviant peers and engagement in risky behaviors and tested the impact of fathers' and mothers' warmth during an in-lab conflict discussion as a putative buffer. In support of HO1, we found consistencies from mid- to late adolescence in affiliation with deviant peers and involvement in risky behaviors. In partial support for HO2, affiliation with deviant peers at T1 significantly predicted future involvement in risky behaviors. However, T1 engagement in risky behaviors was not a significant predictor of later affiliation with

deviant peers. Finally, we found support for a buffering effect of fathers, but not mothers', warmth on the prospective associations between deviant peers and risky behaviors (HO3); fathers's warmth attenuated the associations between T1 deviant peers and T2 deviant peers and T2 risky behaviors. Girls, in particular (HO4), benefitted from their fathers' warmth as a buffer in the trajectory from T1 risky behaviors to T2 risky behaviors and to T2 involvement with deviant peers. To our knowledge, the current study constitute the first attempt at examining the protective role of fathers' and mothers' warmth during an in-lab conflict discussion on bidirectional, prospective associations between deviant peers and risky behaviors.

### **Prospective Associations between Deviant Peers and Risky Behaviors**

The concurrent and longitudinal associations between risky behaviors and risky peers in the present study support and extend similar findings reported in prior research (De Kemp et al., 2006; Reitz et al., 2006; Simons-Morton & Chen, 2006; Trudeau et al., 2012). Our cross-lagged analyses simultaneously tested bidirectional effects and also tested a wide range of risky behaviors, rather than one type, e.g., alcohol use (De Kemp et al., 2006). In support of the influence effect of peers (Leung et al., 2014; Maxwell, 2002), youth who affiliated with deviant peers in mid-adolescence were more likely to engage in risky behaviors in late adolescence. The cross-lagged model did not support the selection effect despite a significant bivariate correlation between T1 risky behaviors and T2 deviant peers. Even at the same time point, the bivariate associations between risky behaviors and deviant peers accounted for less than 50% of the variance ( $r = .58$  at T1 and  $r = .73$  at T2). Thus, some risky behaviors are not explained by a generally deviant peer context. With some exceptions (Kiuru et al., 2010), bidirectional associations in prior research often focused on alcohol use (see Leung et al., 2014, for a review), which tends to be a highly social phenomenon during adolescence (Osgood et al., 2013) and therefore, might influence the selection of friends. However, our examination of risky behaviors included activities that may not typify the peer group as a whole (e.g., risky sex). More generally, Baerveldt et al. (2008) note that the selection effect is less consistently observed than the influence effect and might be more dependent on school or social network context. They also suggest that the selection effect might be stronger for youth who are persistently delinquent than for adolescents who are experimenting with risky behaviors and who will eventually exit this trajectory. This current community-based sample is likely to be more characterized by non-persistent risk-takers.

### **The Protective Effect of Fathers' Warmth**

These findings provide considerable evidence that nonverbal warmth from fathers during a conflictual family discussion can interrupt a youth's trajectory linking risky behaviors and affiliation with deviant peers. According to the results, fathers' warmth buffered all four of the bidirectional pathways between deviant peers and risky behaviors examined here. Parents' warmth previously has been shown to protect against risk-taking behaviors and risky peers (De Kemp et al., 2006; Goldstein et al., 2005). Our results suggest that fathers' abilities and willingness to relate in a warm, accepting and affectionate manner not only is protective but actually can lessen the deviant peers-risky behaviors connection. This is consistent with other studies showing that peers are likely to have more influence on adolescent's risky behaviors in the context of compromised parenting, but less influence in

the context of positive parenting (Chester, Jones, Zalot, & Sterrett, 2007). Being able to show warmth when discussing a troubling issue understandably would be challenging for parents. However, even with no prompting, 78% of fathers and 78% of mothers were able to demonstrate this behavior at least once during these brief, 15-minute discussions.

It is further noteworthy that mothers' warmth did not emerge as a buffer in the risky trajectories examined here. In a number of prior studies, fathers' and mothers' warmth were combined (Trucco et al., 2011; Trudeau et al., 2012), which makes it impossible to disentangle paternal and maternal influences. In the handful of studies in which the effect of fathers was isolated, fathers' parenting was an effective buffer between negative peer influences and adolescents' marijuana use (Dorius et al., 2004) and conduct problems (Trudeau et al., 2012). Our findings are also consistent with past studies suggesting that fathers' positive parenting has a unique (Updegraff, McHale, Crouter, & Kupanoff, 2011; Suizzo, Rackley, Robbins, Jackson, Rarick, & McClain, 2017) and sometimes stronger impact (Williams & Kelly, 2005) than mothers' positive parenting. Gender socialization theory might help in explaining these findings. For instance, mothers are expected to be more involved in parenting than fathers (Williams & Kelly, 2005), and mother's socialization more typically encourages connectedness and expression of affection and compassion. Father's socialization, in contrast, promotes autonomy, agency and independence (Carter, 2014). Therefore, it may be that when fathers break these gender role expectations and display warmth and accepting behaviors in the midst of a conflict, their behaviors are likely to have a profound impact on youth emotional adjustment.

Another distinction in our results is that parental warmth was more protective for girls than for boys. Differential influence of supportive parenting on boys and girls has also been previously reported where positive parenting behaviors such as support, involvement, and cohesion were protective for girls but actually exacerbated the association between deviant peers and risky behaviors in boys (Henneberger, Durkee, Truong, Atkins, & Tolan, 2013; Mashal & Chassin, 2000). Collectively, these results raise questions about whether positive parenting may inadvertently reinforce boys' risky behaviors. Socialization differences again are a possibility (Mashal & Chassin, 2000) in that girls are more socialized to value connectedness to parents whereas boys are more encouraged toward independence and autonomy (Carter, 2014); parental displays of warmth, as indicators of connectedness may be less concordant with autonomy. Finally, the overall context—discussion with parents about a contentious issue—may be more uncomfortable for boys; perhaps parental warmth in another circumstance, such as a shared physical activity, might be better received by boys and have a greater buffering effect.

The current findings also highlight the buffering effect of fathers' warmth specifically with respect to the association between girls' T1 risky behaviors and T2 deviant peers and T2 risky behaviors. Emotionally supportive father-daughter relationships are identified as key factors in girls' mental health, achievement, and lower rates of early pregnancy (Nielsen, 2012; Williams & Kelly, 2005). With respect to risky behaviors, the quality of the father-daughter relationship has been associated with drug-refusal efficacy in African-American adolescent girls (Boyd et al., 2006), lower risky sexual behaviors (Guilamo-Ramos et al., 2012), and lower anti-social behaviors. These important influences of the father-daughter

relationship have been attributed to girls' sense of self-worth (Allgood, Beckert, & Peterson, 2012) and development of assertive behaviors (Russell & Russell, 1989). Paternal warmth and support also has been shown to promote daughters' physiological regulation during stressful situations with a peer (Byrd-Craven, Auer, Granger, & Massey, 2012). The findings here, particularly with the bidirectional effects between deviant peers and risky behaviors, are evidence of another aspect of the far-reaching influences of the father-daughter relationship.

### Limitations

The results of the current study must be interpreted in light of several limitations. First, as with any laboratory-based interaction, we do not know to what extent parents' warmth, as an observed behavior, generalizes to conflict discussions outside of the laboratory and to the full scope of family interactions, i.e., non-problem focused discussions. Second, and relatedly, despite the importance of parental warmth as a central component of closeness and parent-child attachment, other positive forms of parenting not addressed here, e.g., engaging in activities together, could also be buffers. Third, we focused on fathers and mothers' nonverbal warmth without accounting for the potential contribution of verbal displays of warmth. Unfortunately, the coding system used in the current study only provides a global category of positivity and approval instead of a targeted assessment of verbal warmth. Future studies based on a careful assessment of verbal warmth are needed to provide a more complete picture of the contributions of different types of parental warmth on youth adjustment. Fourth, fathers' and mothers' warmth was assessed only at T1, which leaves the question of whether T1 parental warmth influences T2 youth behaviors or T1 warmth continues across time instigating T2 warmth as a more proximal protective factor. Previous studies have found relative stability in parenting behaviors but also some decline in positive parenting across adolescence (Loeber et al., 2000), suggesting that repeated assessment could better characterize the prospective buffering effect of parenting warmth on risky trajectories. Fifth, due to our sample size, we could not run one comprehensive model to test whether fathers' versus mothers' influence in mitigating the associations between deviant peers and risky behaviors are statistically significant; however, we did control for the other parent's warmth in each model that was tested. Sixth, youth provided information about their affiliation with deviant peers and their risky behaviors, which, due to perceived similarity between youth and their peers, potentially inflates the strength of the association between peers' and their own risky behaviors (Hoeve et al., 2009). Seventh, the questionnaire assessing affiliation at T1 was more inclusive, asking more generally whether the participant knows youth who engaged in various risky behaviors, whereas the questionnaire used at T2 asked specifically about friends. Thus, our measures of deviant peers focus on somewhat different types of peer relations across the two time points. Eighth, the implications of deviant peers and parents' warmth might vary across different types of risky behaviors, which is masked by our combined assessment of multiple types of risky behaviors (i.e. alcohol and substance use, risky sexual behaviors, and delinquency). Future investigations with a larger sample size could help disentangle the influence of parents and peers on these separate types of behaviors. Finally, based on the initial recruitment of two-parent families into our longitudinal samples, almost all of these adolescents (92%) were

living with or had regular contact with both their mothers and fathers, making it difficult to generalize these findings to single-parent families.

## Conclusions

Despite these limitations, the findings of the current study support the importance of parental influences, and specifically fathers' warmth, on the links between affiliation with deviant peers and engagement in risky behaviors. Beyond mitigating the influence of peers, which has been the focus of previous research (Trudeau et al., 2012; Vitaro et al., 2000), our results further suggest that fathers can also disrupt other risky pathways, such as the continuance over time of affiliating with deviant peers and engaging in risky behaviors, as well as the prospective connection between engaging in risky behaviors and later selection of peers. The current study also adds to a growing literature examining fathers' impact on adolescent youth, despite the prior focus on maternal parenting behaviors (Lundahl, Tollefson, Risser, & Lovejoy, 2008), and is in line with previous evidence of the prospective and potentially delayed influence of father's involvement on youth adjustment (Cookston & Finlay, 2006). These findings also shine a spotlight on the importance of small, momentary parenting behaviors that convey warmth and caring even when discussing topics that are sources of family conflict. Parents may not be aware that these behaviors still matter to their adolescent and, in turn, adolescents most likely do not show their appreciation of these behaviors exhibited by their parents. Nonetheless, expressions of paternal warmth are indeed valuable in mitigating risky behaviors and affiliations with risky peers, and may be most important to those adolescents already embarking on risky trajectories.

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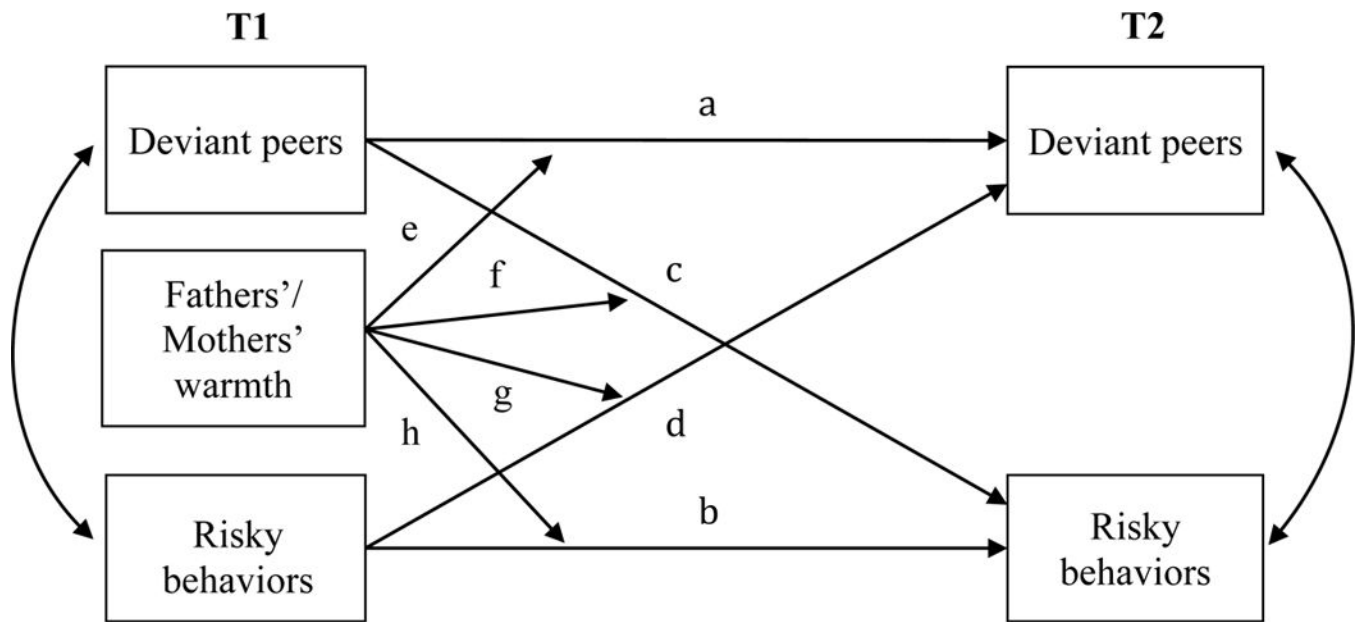
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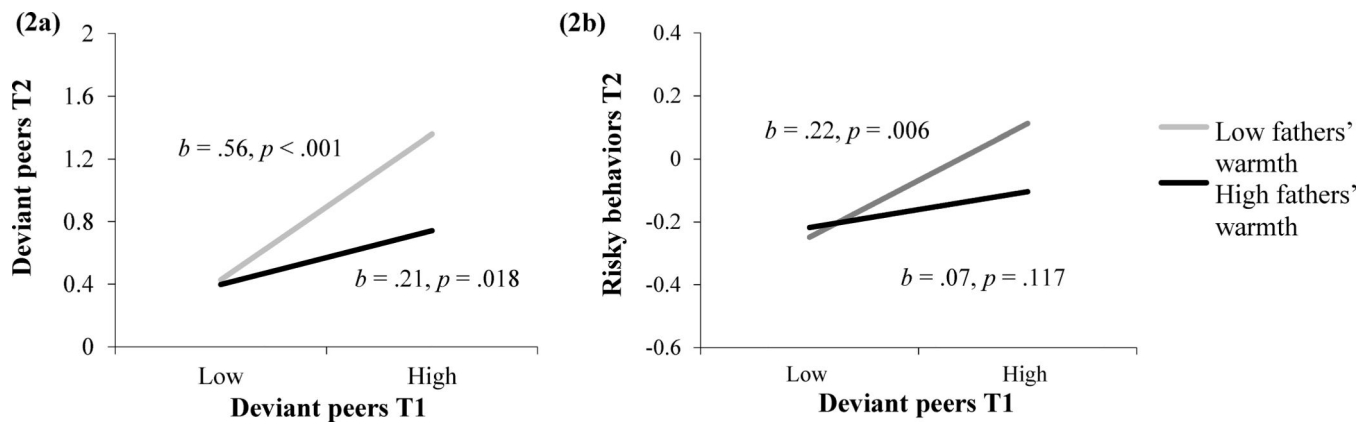
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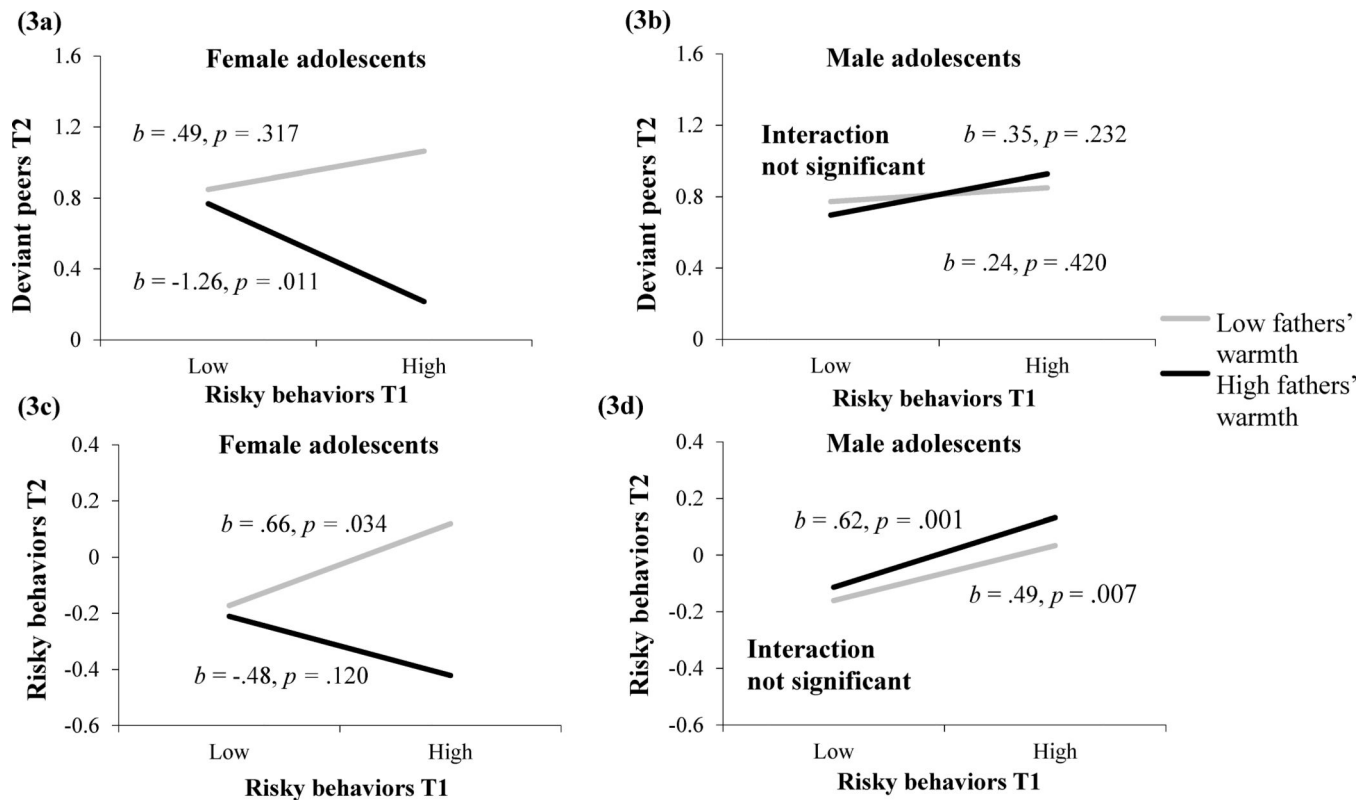


**Figure 1.**

Conceptual Model of the Moderating Role of Fathers' and Mothers' Warmth on the Prospective Associations between Deviant Peers and Risky Behaviors. Path a illustrates the autoregressive path from T1 deviant peers to T2 deviant peers and Path b illustrates the autoregressive path from T1 risky behaviors to T2 risky behaviors. Path c represents the association between T1 deviant peers and T2 risky behaviors. Path d represents the association between T1 risky behaviors and T2 deviant peers. Path e illustrates the moderation effect of fathers' and mothers' warmth on the association between T1 and T2 deviant peers. Path f illustrates the moderation effect of fathers' and mothers' warmth on the association between T1 deviant peers and T2 risky behaviors. Path g illustrates the moderation effect of fathers' and mothers' warmth on the association between T1 risky behaviors and T2 deviant peers. Path h illustrates the moderation effect of fathers' and mothers' warmth on the association between T1 and T2 risky behaviors.



**Figure 2.** Moderation Effects of Fathers' Warmth on the Links from Time 1 (T1) Deviant Peers to Time 2 (T2) Deviant Peers and T2 Risky Behaviors. Panels 2a shows the moderation effect of fathers' warmth on the link between T1 deviant peers and T2 deviant peers. Panels 2b shows the moderation effect of fathers' warmth on the relationship between T1 deviant peers and T2 risky behaviors.



**Figure 3.**

Moderation Effect of Fathers' Warmth on the Links from Time1(T1) Risky Behaviors to Time 2 (T2) Deviant Peers and T2 Risky Behaviors. Panels 3a and 3b show the moderating effect of fathers' warmth in the association between T1 risky behaviors and T2 deviant peers for female and male adolescents respectively. Panels 3c and 3d show the moderating effect of fathers' warmth in the association between T1 risky behaviors and T2 risky behaviors for female and male adolescents respectively. High and low values of warmth and T1 deviant peers are plotted at a score of 1 *SD* above and 1 *SD* below the mean, respectively. High and low T1 risky behaviors correspond to scores at the 80<sup>th</sup> and 20<sup>th</sup> percentiles, respectively.

**Table 1**

Intercorrelations and Descriptive Statistics for all Study Variables

|                                    | 1                   | 2                  | 3                   | 4                 | 5                 | 6                | 7    | 8     | 9     |
|------------------------------------|---------------------|--------------------|---------------------|-------------------|-------------------|------------------|------|-------|-------|
| 1. Deviant peers T1                | –                   |                    |                     |                   |                   |                  |      |       |       |
| 2. Deviant peers T2                | .54 <sup>***</sup>  | –                  |                     |                   |                   |                  |      |       |       |
| 3. Risky behaviors T1 <sup>a</sup> | .58 <sup>***</sup>  | .42 <sup>***</sup> | –                   |                   |                   |                  |      |       |       |
| 4. Risky behaviors T2 <sup>a</sup> | .49 <sup>***</sup>  | .73 <sup>***</sup> | .53 <sup>***</sup>  | –                 |                   |                  |      |       |       |
| 5. Fathers' warmth                 | -.14                | -.14               | -.27 <sup>**</sup>  | -.23 <sup>*</sup> | –                 |                  |      |       |       |
| 6. Mothers' warmth                 | -.10                | .05                | -.20 <sup>*</sup>   | -.18              | .59               | –                |      |       |       |
| 7. Parental monitoring             | -.42 <sup>***</sup> | -.20               | -.39 <sup>***</sup> | -.21 <sup>*</sup> | .31 <sup>**</sup> | .21 <sup>*</sup> | –    |       |       |
| 8. Age                             | .26 <sup>**</sup>   | -.02               | .20 <sup>*</sup>    | .05               | -.22 <sup>*</sup> | -.07             | -.07 | –     |       |
| 9. Family income <sup>b</sup>      | -.02                | .03                | -.07                | .09               | -.04              | -.07             | .04  | .01   | –     |
| Total sample                       |                     |                    |                     |                   |                   |                  |      |       |       |
| <i>M</i>                           | 1.20                | .84                | -.02                | -.03              | .47               | .44              | 3.16 | 15.33 | 10.76 |
| <i>SD</i>                          | .83                 | .65                | .45                 | .43               | .42               | .43              | .42  | .71   | 7.38  |
| Male adolescents                   |                     |                    |                     |                   |                   |                  |      |       |       |
| <i>M</i>                           | 1.07 <sup>†</sup>   | .91                | .00                 | .05 <sup>†</sup>  | .39 <sup>c</sup>  | .38              | 3.11 | 15.36 | 11.15 |
| <i>SD</i>                          | .81                 | .68                | .49                 | .47               | .35               | .41              | .43  | .75   | 7.81  |
| Female adolescents                 |                     |                    |                     |                   |                   |                  |      |       |       |
| <i>M</i>                           | 1.35 <sup>†</sup>   | .76                | -.04                | -.12 <sup>†</sup> | .57 <sup>c</sup>  | .50              | 3.21 | 15.28 | 10.33 |
| <i>SD</i>                          | .82                 | .61                | .40                 | .38               | .47               | .44              | .41  | .66   | 6.91  |

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

<sup>a</sup> Represents the average across Z-scored items.

<sup>b</sup> Income represented as \$10,000.

<sup>c</sup> Male-female adolescents differences  $p < .05$ ;

<sup>d</sup> Male-female adolescents differences  $p < .10$ .

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**Table 2**  
Regression Models for the Moderation Effect of Fathers' and Mothers' Warmth on Time 1 (T1) to Time 2 (T2) Bidirectional Associations between Deviant Peers and Risky Behaviors

|                                      | <u>Fathers' warmth (n = 98)</u> |           | <u>Mothers' warmth (n = 104)</u> |          |           |          |
|--------------------------------------|---------------------------------|-----------|----------------------------------|----------|-----------|----------|
|                                      | <i>b</i>                        | <i>SE</i> | <i>p</i>                         | <i>b</i> | <i>SE</i> | <i>p</i> |
| <b>Predictor: Deviant peers T1</b>   |                                 |           |                                  |          |           |          |
| <b>Model 1: Deviant peers T2</b>     |                                 |           |                                  |          |           |          |
| Deviant peers T1                     | .38                             | .08       | <.001                            | .40      | .09       | <.001    |
| Warmth                               | -.42                            | .15       | .007                             | .47      | .18       | .009     |
| Other parent's warmth                | .57                             | .17       | .001                             | -.38     | .18       | .039     |
| Risky behaviors T1                   | .15                             | .18       | .398                             | .18      | .17       | .288     |
| Sex                                  | .11                             | .11       | .323                             | .15      | .13       | .241     |
| Deviant peers T1 × Warmth            | -.42                            | .15       | .004                             | -.16     | .20       | .288     |
| <b>Model 2: Risky behaviors T2</b>   |                                 |           |                                  |          |           |          |
| Deviant peers T1                     | .14                             | .05       | .005                             | .17      | .06       | .002     |
| Warmth                               | -.12                            | .09       | .177                             | .01      | .12       | .906     |
| Other parent's warmth                | .05                             | .11       | .687                             | -.10     | .10       | .324     |
| Risky behaviors T1                   | .40                             | .13       | .002                             | .28      | .13       | .041     |
| Sex                                  | .14                             | .08       | .096                             | .16      | .09       | .062     |
| Deviant peers T1 × Warmth            | -.18                            | .09       | .050                             | -.12     | .12       | .310     |
| <b>Predictor: Risky behaviors T1</b> |                                 |           |                                  |          |           |          |
| <b>Model 3: Deviant peers T2</b>     |                                 |           |                                  |          |           |          |
| Risky behaviors T1                   | -.19                            | .30       | .526                             | .12      | .18       | .492     |
| Warmth                               | -.72                            | .20       | <.001                            | .44      | .18       | .013     |
| Other parent's warmth                | .51                             | .18       | .005                             | -.37     | .18       | .038     |
| Deviant peers T1                     | .41                             | .09       | <.001                            | .40      | .09       | <.001    |
| Sex                                  | .25                             | .13       | .052                             | .16      | .12       | .179     |
| Risky behaviors T1 × Warmth          | -1.81                           | .57       | .001                             | -.46     | .35       | .183     |
| Risky behaviors T1 × Sex             | .51                             | .38       | .187                             | -        | -         | -        |



|                                    | Fathers' warmth (n = 98) |     |      | Mothers' warmth (n = 104) |     |      |
|------------------------------------|--------------------------|-----|------|---------------------------|-----|------|
|                                    | b                        | SE  | p    | b                         | SE  | p    |
| Warmth X Sex                       | .69                      | .30 | .020 | —                         | —   | —    |
| Risky behaviors T1 × Warmth X Sex  | 1.95                     | .83 | .019 | —                         | —   | —    |
| <b>Model 4: Risky behaviors T2</b> |                          |     |      |                           |     |      |
| Risky behaviors T1                 | .13                      | .23 | .573 | .32                       | .12 | .008 |
| Warmth                             | -.32                     | .12 | .010 | .02                       | .13 | .861 |
| Other parent's warmth              | .02                      | .11 | .872 | -.10                      | .10 | .320 |
| Deviant peers T1                   | .17                      | .05 | .001 | .17                       | .06 | .003 |
| Sex                                | .23                      | .10 | .017 | .18                       | .09 | .048 |
| Risky behaviors T1 × Warmth        | -1.20                    | .39 | .002 | .08                       | .23 | .719 |
| Risky behaviors T1 × Sex           | .38                      | .25 | .128 | —                         | —   | —    |
| Warmth X Sex                       | .42                      | .18 | .022 | —                         | —   | —    |
| Risky behaviors T1 × Warmth X Sex  | 1.39                     | .50 | .005 | —                         | —   | —    |

Notes. Nonsignificant three-way interactions were dropped from models 1 and 2 and from model 3 and 4 for mother's warmth, where they are replaced by dashes. Boxes designate significant interactions that were decomposed (see Figures 2 and 3). Age, family income and parental monitoring were included as covariates. Because they did not change the significance or the direction of the results they were dropped from the models for parsimony.