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Modeling trajectories of adolescent-perceived family conflict: Effects of marital dissatisfaction and parental alcoholism

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Throughout adolescence, children of alcoholic parents (COAs) show rates of psychopathology and impairment across a range of domains that surpass those of non-COAs (Chassin, Pitts, DeLucia, & Todd, 1999; Hussong et al., 2008), including higher rates of internalizing disorders (Chassin et al., 1999; Hussong et al., 2008), externalizing behavior (Chassin, Ritter, Trim, & King, 2003, Park & Schepp, 2014), alcohol and drug use (Chassin, et al., 2003, Chassin et al., 1999), and academic and cognitive deficits (Chassin et al., 2003, Park & Schepp, 2014). Previous studies indicate that impaired family environments partially account for this increased risk (Hussong et al., 2008; Park & Schepp, 2014). Considering the spread of dissatisfaction from the interparental relationship to the broader family context (e.g., Davies & Cummings, 1994; Elam et al., in press; Margolin, Christensen, & John, 1996; Seiffge-Krenke, 1999) is a potentially useful way to conceptualize how this risk is conveyed.

Researchers posit several mechanisms by which marital dissatisfaction causes conflict in the broader family environment. Marital dissatisfaction predicts the use of maladaptive (e.g., violent, avoidant) communication styles within the interparental relationship that are then noticed and modeled by other family members (Bertoni & Bondenmann, 2010; Vuchinich, Vuchinich & Wood, 1993). Marital dissatisfaction also predicts low family cohesion, warmth, and affection (Campbell & Snow, 1992; Katz & Woodin, 2002; Seiffge-Krenke, 1999), and creates negative affectivity in the interparental relationship that then permeates the family environment as a whole (Kitzmann, 2000). However, important gaps in the literature remain regarding the developmental course and sensitivity of the effects of marital dissatisfaction on family conflict as well as the utility of this model for understanding conflict in COA families (Faircloth, Schermerhorn, Mitchell, Cummings & Cummings, 2011; Van Ryzin & Dishion, 2012). Interventionists note that a better understanding of the mechanisms and processes that affect family conflict over time is needed for programming to be maximally effective (Cummings & Schatz, 2012). To address these gaps in the literature, our study characterizes trajectories of family conflict over time, identifies the extent to which marital dissatisfaction alters conflict trajectories in families with adolescents, and identifies whether these trajectories differ in families with an alcoholic parent.

Defining Family Conflict

Common to many definitions of family conflict is a focus on physical and verbal aggression, frequent criticism and displays of anger, and recurring arguments that occur across multiple relationships in the family as opposed to only within dyadic parent-child or parent-parent relationships (Cummings & Schatz, 2012; Van Ryzin & Dishion, 2012). Accordingly, family conflict cannot be inferred from assessments of individual dyads only but should also be assessed as a broader, family level construct (Cummings & Schatz, 2012; Rothenberg, Hussong, & Chassin, 2015; Emery, 1993).

Family systems and social learning theories link marital dissatisfaction with the larger family climate (Margolin et al., 1996; Seiffge-Krenke, 1998). According to family systems theory, in families where parents are unable to effectively communicate with one another threatening tension born from dissatisfaction in the interparental dyad is often redirected towards other dyads (e.g., parent-child dyads) in an attempt to preserve a “normal” state of functioning in the interparental dyad (Margolin et al., 1996). This redirection of tension could manifest in any number of behaviors, including maladaptive communication styles (Bertoni & Bondenmann, 2010), continuity in negative affectivity across dyads (Kitzmann, 2000), lack of warmth, cohesion, and supportive parenting in interactions (Katz & Woodin, 2002; Finger, Eiden, Edwards, Leonard & Kachadourian, 2010), and spill-over of interparental conflict into the larger family environment (Faircloth et al., 2011; Finger et al., 2010). According to social learning theory, family members could observe these modeled behaviors and emulate them when they are dissatisfied with other relationships or events in the family environment (Margolin et al., 1996), consequently increasing family conflict. Therefore, parent perceptions of their satisfaction in one family dyad (i.e. the marital relationship) can increase parental deleterious behaviors across other family dyads that can be observed and experienced by their children, ultimately influencing child perceptions of conflict across the family environment as a whole. The current study offers a methodologically novel approach to investigating these effects by obtaining independent reports of marital dissatisfaction (i.e. mother and father-reports) and family conflict (i.e. adolescent reports).

Furthermore, family theorists have identified adolescence as a developmental period in which family conflict is especially salient due to families having to navigate issues of adolescent autonomy (Margolin et al., 1996). Past investigations have shown that arguments between spouses were at their highest, and adaptive communication between spouses was at its lowest, when their children were adolescents (Margolin et al., 1996; Olson et al., 1983). Additionally, in families with adolescents, high marital dissatisfaction is associated with limited family cohesion, low rates of marital communication, and increased parent-adolescent distance (Steinberg & Silverberg, 1987; Silverberg & Steinberg, 1990, Seiffge-Krenke, 1998). As a result, inter-parental dissatisfaction and subsequent family conflict experienced by adolescents may compromise the sense of protection, safety, and security that is typically provided by families (Cummings & Schatz, 2012; Davies & Cummings, 1994). Therefore, perceptions that adolescents in particular have about family conflict may be a key factor linking marital dissatisfaction with deleterious adolescent outcomes (Cummings & Schatz, 2012).

Although previous studies show that adolescent perceptions of family conflict mediate the relation between inter-parental dysfunction and adolescent adjustment (Davies, Sturge-Apple, Bascoe, & Cummings, 2014; Cummings, Schermerhorn, Davies, Goeke-Morey, & Cummings, 2006), few examine the changing patterns and predictors of family conflict over time. Only two studies systematically examined trajectories of family conflict across time. One 6-year longitudinal study characterized the intensity of family conflict in adolescents with Spina Bifida and controls over ages 9–15. For control youth, the intensity of family conflict increased over ages 9–15, with especially steep increases over ages 11–15, but for youth with Spina Bifida family conflict intensity decreased over ages 9–13 and then increased slightly between ages 13–15 (Jandasek, DeLucia, Holmbeck, Zebracki, & Friedman, 2009). Further demonstrating the heterogeneity in conflict across families over time, Van Ryzin and Dishion (2012) used growth mixture modeling to describe seven trajectories characterizing adolescent-reported family conflict over ages 12–17. In this sample, family conflict was most often consistently low (41% of families) or moderate (37%) over time though for smaller subgroups family conflict was consistently high, rising throughout adolescence, or peaking in 6th, 7th or 8th grade.

Taken together, these studies suggest that there are significant individual differences in how family conflict changes over time. However, neither of these studies capture family conflict across the entirety of late-childhood and adolescence, allowing for changes in conflict at different ages to be assessed. Studies of parent-adolescent dyads suggest that dyadic conflict reaches its peak in late childhood and early adolescence (between the ages of 10–13) before declining in later adolescence (between the ages of 17–20; Shanahan, McHale, Osgood & Crouter, 2007, Feinberg, McHale, Crouter & Cumsille, 2003; Laursen, Coy & Collins, 1998). Although untested, investigators have speculated that family-level conflict may follow a similar pattern of moderate decline over time (Smetana, Campione-Barr & Metzger, 2006). To test this question, *the current study examined trajectories of adolescent-reported family conflict from ages 10–17*. In doing so, the present study makes two novel contributions to the literature. First, the present study broadens the age range over which trajectories of family conflict are estimated, as it is the only study which captures trajectories from ages 10 to 17. Second, the present study is also the first to empirically compare different functional forms of growth in family conflict over late childhood and early adolescence to examine whether declines in conflict are constant over adolescence or show age-specific peaks and valleys.

Parental Influences on Family Conflict

We investigated two parental influences on adolescent-reported trajectories of family conflict, namely high marital dissatisfaction and parent alcoholism. High marital dissatisfaction has been directly associated with family climate. In one study, composite indicators of family climate derived from adolescent-, mother-, and father-reports were significantly associated with marital dissatisfaction across 4 time points when adolescents were ages 13–17 (Seiffge-Krenke, 1998). These significant correlations indicated that high marital satisfaction was associated with lower family climate scores at each time point (Seiffge-Krenke, 1998). Additionally, a longitudinal investigation by Davies and colleagues (Davies et al., 2014) found that parents' marital dysfunction in families when adolescents

were 12 years old predicted increases in adolescent appraisals of family conflict from ages 13 to 14. Similarly, an intervention targeting the effects of marital dysfunction on family-wide conflict in families with 11–16 year-old adolescents found that after treatment, mothers and fathers demonstrated greater support for each other and resolution of interparental conflict, and all family members demonstrated greater constructiveness and less negativity in family-wide conflict discussions (Cummings & Schatz, 2012).

However, many existing studies rely on between-family comparisons, permitting us to conclude that families with high marital dissatisfaction have greater family conflict. These between-family comparisons do not tell us whether or how marital dissatisfaction operates within families to predict changes in conflict over time. Disaggregating between- and within-family effects would add to the literature by examining the extent to which marital dissatisfaction distinguishes families with higher versus low conflict (a between-family effect) as well the extent to which marital dissatisfaction within a family changes levels of conflict over time (a within-family effect). *The current study tests the between- and within-family effects of marital dissatisfaction on adolescent-perceived trajectories of family conflict over time.* In so doing, the present study makes a novel contribution to the existing literature by simultaneously modeling the between- and within-family effects of marital satisfaction. While some investigations have examined between-family effects, no current investigations have disaggregated within-family effects while controlling for between-family effects.

Additionally, existing literature suggests that marital dissatisfaction may serve as a mediator of the effect of parent alcoholism on adolescent perceptions of family conflict such that having a parent with an alcoholism diagnosis predicts high marital dissatisfaction, which in turn predicts high adolescent-perceived family conflict. Support for this hypothesis comes from longitudinal work which finds marital dissatisfaction when children are 24 months old mediates the relation between paternal alcoholism when children are 12 months old and deficits in warm and sensitive parenting when children are 36 months old (Kachadourian, Eiden, & Leonard, 2009). Similarly, multiple investigations find that greater parental problem drinking predicts high marital dysfunction which in turn is associated with greater maladaptive parenting (i.e. low warmth, high control and conflict) in children ages 5–12 (Keller, Cummings, Davies, & Mitchell, 2008; Keller, Cummings, & Davies, 2005; El-Sheikh & Flanagan, 2001). Taken together these studies suggest that marital dysfunction is one mechanism by which parent alcoholism conveys its deleterious effects on the family environment.

However, there are also several opportunities to build on existing literature. First, extant investigations have predicted outcomes at the dyadic (e.g., parenting behaviors) but not the family level. Investigating family-wide conflict could allow for greater understanding of how parent characteristics affect functioning across multiple family relationships (Emery, 1993). Additionally many studies measure marital dissatisfaction and parenting behaviors at the same point in time, making it difficult to determine if parent alcoholism affects the interparental relationship first, which then leads to family dysfunction, or vice-a-versa. Finally, current literature has only investigated the mediating role of marital dissatisfaction in families with young children. However, investigation of this mediating process during

adolescence is warranted, as researchers have called for future studies to examine marital dissatisfaction as a mediator in older samples of children (Kachadourian et al., 2009) and adolescents are at high-risk for experiencing deleterious effects of parent alcoholism (Chassin et al., 2003). Therefore, the present investigation uniquely contributes to existing literature by examining marital dissatisfaction as a potential mediator of the prospective links between parent alcoholism and family conflict in a sample of families with adolescents.

The Current Study

The current study examined whether the effects of high marital dissatisfaction on family conflict occur across time within families and whether these effects are a mechanism conveying risk in families with an alcoholic parent. Based on literature reviewed above, we hypothesized that (1) adolescent-reported trajectories of family conflict will peak in early adolescence before declining over time, (2) predictors of these trajectories will show that COA families have higher initial levels of conflict and greater increases in family conflict over time compared to non-COA families, (3) between-family effects of marital dissatisfaction on family conflict will show that families with higher marital dissatisfaction will have adolescents who report higher initial levels of conflict and greater increases in family conflict over time, (4) within-family effects of marital dissatisfaction on family conflict will show that when marital dissatisfaction is higher than usual for a family adolescent-reported family conflict is higher than usual, and (5) marital dissatisfaction will mediate the relationship between parental alcoholism and family conflict. We tested these hypotheses using a longitudinal investigation of adolescent children of alcoholics and matched controls aged 10–17 who were followed over three years.

Methods

Data from the Adolescent and Family Development Project (AFDP; Chassin, Rogosch, & Barrera, 1991) were used for this study. AFDP is an ongoing longitudinal study of children of alcoholic parents (COAs) and matched controls assessed from adolescence into adulthood. The current study analyzed data from the first three assessment waves when data were collected annually from mothers, fathers, and a single target adolescent in initially intact families.

Participants

At wave 1, the AFDP sample consisted of 246 adolescents with at least one alcoholic parent and 208 matched adolescents with no biological or custodial alcoholic parent (Chassin et al., 1999) for a total of 454 families. Attrition was minimal, as 445 of 454 families (98%) were retained at the annual wave 3 time point. COA families were recruited using DUI court arrest records, HMO wellness questionnaires and community telephone screenings (see Chassin et al., 1991) and met the following inclusion criteria: parents reported being either Hispanic or non-Hispanic Caucasian, Arizona residents, had a child aged 10.5–15.5 years at wave 1, were English-speaking, and like their children had no cognitive limitations that would preclude interview. Direct interview data confirmed that at least one parent in COA families met *DSM* criteria (*DSM-III*; American Psychiatric Association, 1980) for alcohol

abuse or dependence. When a COA family was identified, reverse directories were used to identify matched control families living in the same neighborhood. Controls were screened to match COAs in ethnicity, family structure (single versus two-parent household), target child's age and gender, and socioeconomic status.

The current analyses included data from 435 families (54.2% COA families) who had at least one adolescent-report of family conflict and at least one mother- or father-report of marital dissatisfaction across the three waves (19 families were excluded from the study because parents in these families reported being divorced at all 3 time points). Adolescents were 53% male, 71% Caucasian, 23% Hispanic, and 6% of other ethnic origin and ranged in age from 10 to 17 across waves ($M = 13.2$ ($SD = 1.4$) at wave 1, 14.2 ($SD = 1.4$) at wave 2, 15.2 ($SD = 1.4$) at wave 3). Mothers in these families were 81% Caucasian, 16% Hispanic and 3% of other ethnic origin, ranging in age from 24 to 54 at wave 1 ($M = 38.9$, $SD = 5.62$). Fathers in these families were 78% Caucasian, 21% Hispanic and 1% of other ethnic origin, ranging in age from 28 to 69 at wave 1 ($M = 41.2$, $SD = 6.15$). Although minimal, missing data among the 435 families was addressed using multiple imputation techniques (see results) such that all 435 families were retained in analyses.

Procedure

At each of three annual waves, parental consent and adolescent assent were obtained first, and then data were primarily collected via in-person computer-assisted interviews (Chassin et al., 1991). Family members were typically interviewed simultaneously and in separate rooms to avoid contamination and to increase privacy. Interviews typically lasted from 1 to 3 hours and participants were paid up to \$70 per wave. Confidentiality was reinforced with a Department of Health and Human Services Certificate of Confidentiality. All study procedures were reviewed and approved by the university's Institutional Review Board.

Measures

Demographics—Parents and adolescents identified their gender (0= female, 1= male) and adolescents reported their age. Child gender was controlled in all analyses.

Parental alcohol use disorder (AUD)—The presence of parental lifetime DSM-III diagnoses of alcohol abuse or dependence was determined by direct parent report from a computerized version of the DIS-III interview (Version 3; Robins, Helzer, Croughan & Ratcliff, 1981). Alcoholism diagnoses were based on spousal report for non-participating parents using Research Diagnostic Criteria (FH-RDC; Andreasen, Endicott, & Spitzer, 1977). In current analyses, families were characterized as having an alcoholic parent if at least one parent met lifetime criteria for a substance use disorder.

Family conflict—Family conflict was measured using a 5-item family conflict subscale derived from Bloom's Family Processes Scale (Bloom, 1985). Adolescents rated the extent to which they agreed that a statement reflected their family life in the past 3 months using a five-point response scale ranging from 1 (*"strongly agree"*) to 5 (*"strongly disagree"*). Examples of items include, "We fought a lot in our family" and "Family members sometimes got so angry they threw things". In the present study, internal reliability estimates

for adolescent reports ranged from $\alpha=.70$ to $\alpha=.75$ across waves. Items were averaged so that higher scores indicated higher levels of family conflict. Zero-order correlations among observed variables, including family conflict, are presented in Table 1.

Marital Dissatisfaction—Marital dissatisfaction was measured using two items from the Dyadic Adjustment Scale (DAS; Spanier, 1976). The DAS has been found to have adequate internal reliability in previous studies ($\alpha = .94$; Spanier & Thompson, 1982) and to demonstrate discriminant validity in distinguishing between distressed and non-distressed couples (Margolin & Wampold, 1981). In the present study, internal reliability estimates ranged from $\alpha=.81$ to $\alpha=.84$ across waves for mothers and from $\alpha=.67$ to $\alpha=.78$ across waves for fathers. Mothers and fathers reported how often things between them and their partners were going well on a six-point scale ranging from 1 (“*a lot of the time*”) to 6 (“*never*”). Mothers and fathers also reported how happy they were with their relationship in the past 3 months on a scale from 1 (“*extremely unhappy*”) to 7 (“*extremely happy*”). The second item was reverse scored and both items were then standardized at each time point (which was indexed by adolescent age, rather than wave of assessment, to match the time metric used in analyses, see below). Items were standardized for two reasons. First, they were standardized to account for differences in response scales (i.e., before standardization one of the items was on a 6 point scale, and the other was on a 7 point scale). Second, they were standardized by time point to control for changes in marital dissatisfaction over time. We initially attempted to model such change by estimating growth models for mother and father marital satisfaction, but analyses revealed that neither the slopes for mother- ($\beta = -0.02$, $p = .41$) or father-reported ($\beta = 0.02$, $p = .22$) marital satisfaction were significant, indicating that these measures did not systematically vary over time. To be conservative in our analyses, however, we still standardized items at each time point to control for change in marital satisfaction over time while still preserving time-specific effects of marital dissatisfaction on family conflict. After standardization, the two items were averaged at each time point to form repeated measures of father and mother-reported marital dissatisfaction.

These indicators were then family-mean centered to capture the *within-family effect* of mother- and father-reported marital dissatisfaction at each time point. Additionally, family means for mother and father marital dissatisfaction across all waves of assessment were calculated and grand mean-centered to capture the *between-family effect* of mother and father-reported marital dissatisfaction. For all measures of marital dissatisfaction, higher scores indicate higher marital dissatisfaction.

Analytic Strategy

Longitudinal studies of development collect repeated measures on the same families over time creating a hierarchical data structure in which repeated measures are *nested* within families across time. MLM is an optimal analytic framework when analyzing nested longitudinal data, especially when compared to conventional general linear model-based techniques (such as ANOVA). These techniques assume independence of repeated observations of the dependent variable, and consequently do not account for the effects of nesting on the data structure. Therefore, general linear modeling frameworks are unable to disaggregate variability attributable to between-group differences from variability

attributable to time-specific within group effects. Without accounting for each source of variance, model parameter and effect sizes estimates can be biased, and study inferences can be limited (Curran & Bauer, 2011; Raudenbush & Bryk, 2002).

Multilevel modeling (MLM) within the SAS 9.3 software package was used to test study hypotheses and analyses followed recommendations by Curran and Bauer (2011) throughout. In the MLM framework, repeated measures can be linked within families over time to form trajectories that are defined by a family-level intercept and slope (Curran & Bauer, 2011; Raudenbush & Bryk, 2002). Differences across families in these intercepts and slopes can then be predicted to test how predictors alter trajectory development *between families over time*. In the current study, these *between-family predictors* include parental AUD as well as mother- and father-reported marital satisfaction (as demonstrated in Figure 3).

A significant advantage of MLM is that it also can be used to examine how an underlying trajectory can be altered, or perturbed, *within a family at a specific time point*. For instance, perhaps in one family, the underlying trajectory of adolescent-perceived family conflict indicates that family conflict is decreasing as the adolescent ages. However, in this same family, adolescent-perceived family conflict may increase dramatically at a specific time point, *despite the fact that the overall trajectory of adolescent-perceived conflict in the family is decreasing*. MLM allows investigators to model and predict why such time-specific within-family effects occur *even after controlling for variance explained by the overall trajectory of adolescent-reported conflict in the family*. In the current study, these effects are represented at the bottom of Figure 3, with pathways from mother-reported marital dissatisfaction predicting age-specific adolescent-perceived family conflict (father-reported marital dissatisfaction was not significant and thus not included in Figure 3 due to space limitations, see results). Following recommendations by Curran and Bauer (2011), we tested these effects by creating two indicators of marital dissatisfaction to disaggregate between- and within-family effects; one that is *grand-mean* centered to allow for prediction of the between-family effects of predictors on trajectories (i.e. effects on intercept and slope) and one that is *family-mean centered* to allow for the prediction of the within-family effects of the predictor on time-specific alterations in these trajectories (i.e. the prediction of age-specific adolescent-perceived family conflict not already accounted for by the underlying trajectory).

All MLM analyses were based on adolescent age rather than wave of assessment as the indicator of time (see Figure 3 for sample size at each wave). This decision was made because adolescents of multiple ages were included in each study wave. Therefore, to separate age from study wave in this cohort-sequential study design and to capture family conflict trajectories across adolescence, adolescent age was used as the unit of time in study analyses. An advantage of MLM over other analytic frameworks (e.g. repeated measures ANOVAs or MANOVAs) is that MLM's maximum-likelihood estimation approach can account for data sparseness in parameter estimates when age, instead of wave, is used as the unit of time (Biesanz, Deeb-Sossa, Papadakis, Bollen, & Curran, 2004; Curran & Bauer, 2011). Analyzing data by age is an established practice in multilevel modeling of

longitudinal data (Curran & Bauer, 2011), and has been applied to the AFDP data set (e.g., Hussong et al., 2012; Hussong et al., 2010).

We had complete data for both between-family covariates (parent gender and parental AUD). We addressed the issue of missing data in the within-family covariates (mother- and father-reported marital dissatisfaction) and adolescent-reported family conflict using multiple imputation (Schafer, 1997, Mistler, 2013). Out of the total number of observations ($n = 1290$), 8.7% ($n = 112$) were missing mother-reported marital dissatisfaction, 20.2% ($n = 261$) were missing father-reported marital dissatisfaction, and 0.01% ($n = 11$) were missing adolescent reported family conflict. The primary source of missing within-family covariate data was reporter unavailability at the time of the interview. Notably, those families missing at least one report of marital dissatisfaction or family conflict reported significantly higher mother- ($t = -5.94$ to -3.48 , $p < .01$ across wave) and father-reported ($t = -3.51$ to -2.35 , $p < .05$ across wave) marital dissatisfaction, as well as higher family conflict ($t = -3.27$ to -2.56 , $p < .05$ across wave) than those families which did not report any missingness. Because there were systematic differences across groups, we could not assume data were missing completely at random and engage in list-wise deletion. Therefore, following convention in the MLM literature, we conservatively assumed that our data were missing at random (i.e. that the probability that a variable is missing depends on other variables which are present in the data set; Curran & Bauer, 2011). To control for systematic missingness among study variables and conduct analyses consistent with the missing at random assumption, we imputed missing data. Following standard recommendations in the multiple imputation literature (Rubin, 1996), we created 50 data sets for which missing data in the within-family covariates was imputed and we included all independent and dependent variables in the MMI_Impute model. We used a SAS Macro written by Mistler (2013; MMI_Impute) to impute missing data in the within-family covariates. MMI_Impute imputes missing data using an adaptation of Joseph Schafer's PAN algorithm (Mistler, 2013; Schafer, 2001).

Results

Modeling Trajectories of Family Conflict

Before trajectories were fit to the data a random-effects only model was estimated to determine whether significant variability existed between and within families on adolescent-perceived family conflict. A random effects model revealed significant between- ($\tau_{00} = 0.31$, $p < .01$) and within- ($\sigma^2 = 0.27$, $p < .01$) family variability in adolescent-reported family conflict with an intra-class correlation (ICC) of 0.54, indicating that of the total variability in family conflict, 54% was due to differences between families and 46% was due to within-family differences. To capture these family differences, we estimated a series of models to identify the functional form of family conflict over time. Intercepts for trajectories were centered at age 10. We compared three competing models: a random intercept-only model (i.e., differences in intercepts across families with no random slope estimated), a linear growth curve model with a random intercept and linear random slope, and a quadratic model with a random intercept, linear random slope, and quadratic random slope. Results of a likelihood ratio test revealed that the linear growth curve model fit the data significantly

better than the random intercept-only model ($\chi^2(2) = 6.7, p = .04$), and that there was no significant model improvement when the quadratic slope term was added, indicating that a linear growth curve model best captured change in adolescent-perceived family conflict over time. Supporting hypothesis 1, the linear growth model had a significant mean intercept ($\widehat{\gamma}_{00} = 2.70, p < .01$) and a significant negative slope ($\beta = -0.07, p < .01$) such that, on average, adolescent-reported family conflict when the adolescent was aged 10 was about 2.7 units (between “Disagreeing” and “Neither Agreeing or Disagreeing” that their family had conflict) and decreased modestly across ages 10–17 at a rate of 0.07 units per year. Additionally, variance in both intercept ($\tau_{00} = 0.46, p < .01$) and slope ($\tau_{11} = 0.16, p < .01$) was significant, indicating significant between-family differences in both intercept and slope.

Between-Family Effects of Parent Substance Use

To test all other study hypotheses, we estimated a series of conditional multilevel models. We fit each model to all $N = 50$ imputed data sets and combined the parameter estimates and standard errors using SAS PROC MIANALYZE (which implements procedures developed by Rubin, 1987). In the first model testing hypothesis 2 (depicted by Model 1 in Table 2), we added parent AUD and child gender as a predictor of the intercept and slope of adolescent-reported family conflict trajectories to examine the between-family effects of parent AUD. Parent AUD predicted between-family differences in intercept ($\beta = 0.25, p < .01$), but not slope ($\beta = 0.05, p = .10$). Therefore, at age 10 adolescents from families with a parent AUD perceived family conflict to be 0.25 points higher than adolescents from families without an AUD diagnosis, and this difference did not significantly change over time (as depicted graphically in Figure 1). Additionally, child gender did not significantly predict differences in intercept ($\beta = -0.06, p = .33$) or slope ($\beta = 0.00, p = .94$). In the interest of parsimony, non-significant paths predicting family conflict trajectory slope from parent alcoholism and adolescent gender were dropped in subsequent analyses.

Between and Within-Family Effects of Marital Dissatisfaction

We next tested the between- and within-family effects of marital dissatisfaction on adolescent-reported family conflict. We added to model 1 the two between-family predictors (i.e. grand-mean centered mother and father-reported marital dissatisfaction) and the two within-family predictors (i.e. family-mean centered mother and father-reported marital dissatisfaction) of adolescent-perceived conflict. The between-family predictors were each used to predict differences in the intercept and slope of adolescent-perceived conflict trajectories. Mother-reported marital dissatisfaction was found to be a significant predictor of slopes ($\beta = .05, p = .02$), but not intercepts ($\beta = .03, p = .76$). These results indicate that that mother-reported marital dissatisfaction did not predict initial differences between families on adolescent-perceived conflict at age 10, but did predict changes in adolescent-reported family conflict over time. To discover the age at which mother-reported marital dissatisfaction does become a significant predictor of adolescent-perceived conflict, we performed a series of analyses in which we re-estimated our model with child age re-centered at each year after age 10. These analyses revealed that the between-family effect of mother-reported marital dissatisfaction was a significant predictor of adolescent-reported family conflict starting at age 13 ($\beta = .11, p = .03$), and predicted attenuated decreases in

adolescent-reported family conflict over time until age 17 ($\beta = 0.37, p < .01$). In families with higher mother-reported marital dissatisfaction, adolescent-perceived family conflict decreased less steeply across ages 13–17. Figure 2 depicts these findings by presenting the extent to which various levels of mother marital dissatisfaction (i.e. one standard deviation above-mean, below-mean, and mean marital dissatisfaction) predicted attenuated decreases in adolescent-perceived family conflict over time. As seen in Figure 2, while marital-dissatisfaction scores do not differentially predict adolescent-perceived family conflict at age 10 higher mother-reported marital dissatisfaction scores do predict less steep declines in family conflict over time.

Father-reported marital dissatisfaction was a significant predictor of the intercept ($\beta = 0.13, p < .01$) but not the slope ($\beta = .01, p = .62$) of adolescent-perceived family conflict. Adolescents reported greater family conflict in families with higher father-reported marital dissatisfaction when adolescents were age 10, and this effect remained constant over time.

We also examined time-specific within-family effects for mother and father-reported marital satisfaction. Within-family effects for mother ($\beta = 0.08, p < .01$) but not father-reported ($\beta = 0.02, p = .52$) marital dissatisfaction were significant, indicating that at any given adolescent age, a one unit deviation in mother-reported marital dissatisfaction corresponded to a 0.08 unit deviation in adolescent-reported family conflict above and beyond the deviation expected given a family's underlying conflict trajectory. In other words, if at any given time point mother-reported marital dissatisfaction was higher than usual, adolescent-perceived family conflict was higher than expected given the family's overall conflict trajectory. We also tested whether the effects of marital dissatisfaction differed in magnitude at different time points (e.g., does the magnitude of the association between marital dissatisfaction and family conflict at age 11 meaningfully differ from the same association at age 14, 16, etc.) by estimating predictor-by-age interactions. Interactions between father-reported ($\beta = 0.01, p = .51$), and mother-reported ($\beta = -0.01, p = .50$) marital satisfaction and age were not significant. This indicates that the time-specific associations between both mother- and father-reported marital dissatisfaction and adolescent-perceived family conflict do not differ meaningfully in magnitude over age. Therefore, the magnitude of the significant within-family effect of mother-reported marital satisfaction on adolescent-perceived family conflict (i.e. $\beta = 0.08, p < .01$) can be held constant across age. Results from can be found in Table 2 (model 2), and are also depicted at the bottom of Figure 3. Notably, we conducted a sensitivity analysis to test whether gender of the alcoholic parent impacted these findings and found that it did not. The between and within-person effects of mother- and father-reported marital satisfaction were significant, and of virtually the same magnitude (significant coefficients did not differ more than .01 across models) regardless of whether mother or father alcoholism diagnosis was used as the predictor of COA status.

Overall, model results supported Hypotheses 3 and 4, marital dissatisfaction had both between and within-family effects on family conflict, even after accounting for the effects of parental AUD and child gender. Higher father-reported marital dissatisfaction predicted higher adolescent-reported family conflict at age 10, but mother-reported effects of marital dissatisfaction were the only significant predictor of change in family conflict over time and within families.

Mediating Effects of Marital Dissatisfaction

Finally, because parent alcoholism was a significant predictor of the adolescent-reported family conflict intercept, but not slope, in Model 1, we tested whether marital dissatisfaction mediated the association between parent alcoholism and initial adolescent-reported family conflict at age 10. We conducted separate mediational models using both mother and father-reported marital dissatisfaction indicators. As reported in Model 1 above, the direct effect of parental AUD was found to significantly predict adolescent-reported family conflict at age 10 ($\beta = 0.25, p < .01$). This association was still significant ($\beta = 0.13, p < .05$), but greatly reduced in magnitude in Model 2, once mother-reported and father-reported marital dissatisfaction were added as predictors of initial levels of adolescent-reported family conflict. This drop in magnitude of the effects of parental AUD as a predictor from model 1 to model 2 is consistent with mediation but to formally test this effect we followed procedures in Krull and MacKinnon (1999). Results revealed that the indirect effects of parental AUD on initial levels of adolescent-reported family conflict at age 10 through both father- ($\beta = 0.06, p < .01$) and mother-reported marital dissatisfaction ($\beta = 0.10, p < .01$) were significant. Therefore, hypothesis 5 was supported, as both father- and mother-reported marital dissatisfaction partially mediated the effect of parental AUD on family conflict intercept. The presence of a parental AUD predicted higher father and mother marital dissatisfaction which in turn predicted higher initial adolescent-reported family conflict at age 10.

Discussion

We characterized trajectories of adolescent-perceived family conflict from ages 10–17 and explored whether marital dissatisfaction explained the differential development of these trajectories in COA versus non-COA families. Results showed that on average moderate levels of family conflict are perceived by adolescents at age 10, with moderate linear decreases in family conflict over time. Adolescents in families where a parent had a substance use diagnosis reported higher levels of conflict than their peers at age 10 and this difference remained stable over time. This effect was partially mediated by parent-reported marital dissatisfaction. Additionally, both between-family and within-family effects of marital dissatisfaction on family conflict were found, but these effects depended on the parent reporter. Greater father-reported marital dissatisfaction predicted greater family conflict when adolescents were age 10, and this effect remained stable across adolescence. Greater mother-reported dissatisfaction predicted significant attenuated decreases in adolescent-reported family conflict across ages 13–17. Moreover, mother reported marital dissatisfaction at a particular time point predicted higher-than expected levels of adolescent-reported family conflict at that time point compared to a family's expected level of conflict across all time points. Notably, this within-family effect was significant *even after accounting for the between family effects of marital dissatisfaction*. So, regardless of whether a family demonstrated “low”, “medium” or “high” marital dissatisfaction compared to other families, the within-family effect of mother-reported marital dissatisfaction was significant. We consider how these findings contribute to our understanding of the effects of marital dissatisfaction in COA and non-COA families below.

Trajectories of family conflict

Commensurate with evidence from the parent-child dyadic conflict literature (Shanahan et al., 2007; Feinberg et al., 2003), adolescent-reported family conflict was found to moderately decrease across time in our sample. However, present findings also add to this literature by examining family-wide (as opposed to dyadic) conflict, by modeling family conflict trajectories across a wider age range than previously studied (i.e. ages 10 to 17), and by defining a functional form for average family conflict trajectories over time (i.e., moderate linear decreases). Several processes could explain the finding that adolescent-reported family conflict was found to moderately decrease across time. First, as adolescents age and spend less time in the home, they have fewer opportunities to engage in, or observe, family conflict and more time with their peers (Cobb, 2010; Moretti & Peled, 2004). Second, adolescent reports of family conflict may decrease across time as adolescents and their parents resolve issues around adolescent autonomy. Longitudinal studies have found that adolescent autonomy increases from early to late adolescence (Wray-Lake, Crouter, & McHale, 2010; Friedman, Holmbeck, DeLucia, Jandasek & Zebracki, 2009) and is a process which requires negotiation between parents and teens (Wray-Lake et al., 2010; Hock, Eberly, Bartle-Haring, Ellwanger, & Widaman, 2001). As teens grow older and parents allow them greater freedom, parent-adolescent arguments around adolescent autonomy, and accompanying family conflict, may dissipate. Thus, either decreased opportunity for family conflict, or resolution of family conflict through autonomy granting could explain why adolescent-reported family conflict decreases over time.

Effects of Parent Substance Use Diagnosis

Similar to other investigators, we found higher family conflict in families with a parental AUD than in those without (Cummings & Davies, 2002; Escallier-Nicola, Botwin, & Tartar, 1994) but our results add to existing literature by indicating that this effect is stable across time and partially mediated by parents' marital dissatisfaction. The robustness of these findings is perhaps remarkable when one considers that many of the parents in the current sample who had a history of alcohol use disorder had not experienced AUD-related symptom recently (71.3% of COA families had no AUD diagnosis in the past year when evaluated at the first wave of assessment). Therefore, it appears that marital dissatisfaction may be a proximal mechanism which accounts for risk conferred by more distal parental AUD on current adolescent-reported family conflict.

This indirect effect of parental AUD on family conflict through marital dissatisfaction could represent a truly causal process. In families with an alcoholic parent disagreements between partners could lead to increased marital dissatisfaction and subsequent increased family conflict. Support for this causal pathway emerges from studies demonstrating that differences in heavy drinking patterns between partners prospectively predict higher marital dissatisfaction scores across a 2-year period (Homish & Leonard, 2007), and that parental problem drinking prospectively predicts marital dysfunction one year later, even after controlling for earlier marital dysfunction (Keller et al., 2008). Notably, both of these studies controlled for heavy drinking by one or both parents which occurred contemporaneously with measures of marital adjustment, suggesting that distal alcoholism could set in motion conflictual patterns of partner interaction that persist whether or not substance use continues.

These persistent conflictual interaction styles between partners could spill-over into the family context causing maladaptive parent-child interaction patterns and increased family conflict.

Alternatively it is also possible that both parental AUD and the behaviors which facilitate marital dissatisfaction arise from the same underlying deficits. Support for this perspective can be found from work describing underlying predispositions to behavioral disinhibition (Zucker, 2006) or behavioral inhibition (Hussong, Jones, Stein, Baucom, & Boeding, 2011) which have been found to predict higher substance abuse as well as maladaptive interactional styles. These underlying predispositions in one or both parents could drive both the development of parental AUDs and the conflictual inter-parental interaction styles that create higher marital dissatisfaction and in turn gives rise to family-wide conflict. In this way, for a given individual, parental AUD and marital dissatisfaction could be thought of as markers of heterotypic continuity along a single underlying pathway (i.e. either the behavioral disinhibition or behavioral inhibition pathway).

Between- and Within-Family Effects of Marital Dissatisfaction

Consistent with existing literature (e.g., Cummings & Schatz, 2012), present findings indicate that differences in marital dissatisfaction can result in differences in adolescent-reported family conflict between families over time. Adding to this literature, the present study also found elevations in marital dissatisfaction predicted elevations in family conflict at particular points in time, even after controlling for whether families have an alcoholic parent. In considering differences between families, higher father-reported marital dissatisfaction predicted higher initial levels of adolescent-perceived family conflict at age 10, which remained stable over time. However, mother-reports of marital dissatisfaction did not predict between-family differences in conflict until adolescents were age 13, after which higher mothers' marital dissatisfaction predicted less steep declines in adolescent-reported family conflict over time.

The demand-withdrawal pattern is one example of a maladaptive interparental interaction pattern which could account for the effects of both mother- and father-reported marital dissatisfaction on adolescent-perceived family conflict. This interaction pattern is characterized by one partner (more often the woman in a heterosexual relationship) demanding change in the relationship due to a lack of power or greater desire for more closeness in the relationship, and the other partner (more often the man) withdrawing due to their desire for independence (Holley, Strum & Levenson, 2010). Demand behaviors have been shown to increase over the course of dissatisfactory interactions, but withdrawing behaviors show no change over time (Baucom, et al., 2010). Therefore, father-reported marital dissatisfaction may predict high, stable adolescent-reported conflict across time because the interactional behaviors fathers are most likely to exhibit as a result of marital dissatisfaction (e.g., withdrawal or avoidance) do not grow across repeated interaction, and thus predict high, unchanging family conflict across time. Mother-reported marital dissatisfaction may predict attenuated decreases in family conflict across time because the interactional behaviors mothers are most likely to exhibit as a result of marital dissatisfaction

(e.g., demand for closeness) increase over time and demonstrate accumulated effects on adolescent-perceived family conflict.

Results also indicate that when mother-reported marital dissatisfaction is higher than usual within a family adolescent-reported family conflict is also higher than usual. Modeling and adaptation of maladaptive interaction patterns from the interparental relationship to the larger family environment could account for this finding. Extant research indicates that marital dissatisfaction predicts more frequent use of maladaptive interaction styles (e.g. violent and avoidant styles; Bertoni & Bodenmann, 2010), greater negativity and less warmth throughout the family (Kitzmann et al., 2000; Katz & Woodin, 2002) and worse ability to problem-solve in parent-child triads (Vuchinich et al., 1993). Adolescents consequently observe, experience, and engage in these deleterious interaction patterns across family relationships, potentially leading to the development of coercive interactions throughout the family and higher family conflict. Mother-, but not father-, reported marital dissatisfaction may have had a significant within-family effect due to family roles that impact adolescents opportunities to observe dissatisfaction in each parent. In most families women are still the primary caretakers of children (Craig & Mullan, 2011). Therefore, adolescents may observe mothers' frustrations with the marital relationship more often, and thus experience the deleterious affective and behavioral effects of mother dissatisfaction in the family context more frequently. In contrast, marital dissatisfaction may lead to father's withdrawal from interparental and family interactions (Baucom et al., 2010) and decrease opportunity for adolescents to observe fathers' frustration. Notably, these significant within-family effects make a novel contribution to the literature by indicating that the effect of mother-reported marital dissatisfaction on adolescent perceptions of conflict is not confined to families which demonstrate chronic elevations in marital dissatisfaction. These within-family effects indicated that regardless of a families' average level of marital dissatisfaction, higher marital dissatisfaction at a particular time point can result in higher adolescent-perceived family conflict at that time point. Put another way, the significant between-family effects found in the current analyses indicate that marital dissatisfaction has persistent effects on adolescent-perceived family conflict across time, while the significant within-family effects indicate that marital dissatisfaction also has acute, time-specific associations with adolescent-perceived family conflict. No prior research has simultaneously measured both acute and persistent effects of marital dissatisfaction on adolescent-perceived family conflict.

Summary

Though study findings present a new perspective on trajectories of family conflict in both COA and non-COA families, several limitations should be noted. First, in the present investigation marital dissatisfaction was measured using only two items. Investigations of the Dyadic Adjustment Scale indicate that at least 4 items are needed to adequately assess marital satisfaction (e.g., Funk & Rogge, 2007), and thus caution is needed in interpreting these study effects. However, other longitudinal investigations have used only 1 of these items to measure marital dissatisfaction to successfully fit growth curve models (e.g., Gochoff, John, & Helson, 2008), and both items in the present study have been used as part of larger scales in myriad other studies which have investigated marital dissatisfaction (e.g.

Langer, Yi, Storer, & Syrjala, 2010; Pruchno, Wilson-Genderson & Cartwright, 2009). Additionally, the two items used in our study are identified among the core constructs central to measuring marital satisfaction in systematic reviews of the literature (Marshal, 2003), and are identified among the items on the Dyadic Adjustment Scale which provide the most information on marital satisfaction using Item Response Theory analyses (Funk & Rogge, 2007). Moreover, significant between and within family-effects of marital satisfaction were found despite limitations in the measurement of marital satisfaction, suggesting that meaningful inferences can be drawn from study analyses despite limitations in the measurement of marital satisfaction. Second, the present investigation obtained family conflict reports from only one child per family, so we were unable to explore whether children of different genders perceived family conflict differently within each family. Third, family conflict was measured using only adolescent self-reports of family conflict. However, a focus on adolescent-reported family conflict was part of study design (so that the effects of spill-over of marital dysfunction on adolescent perceptions of the family could be adequately captured). Additionally, other investigations utilizing the same measure of adolescent-reported family conflict in the sample have also demonstrated significant predictive effects and expected links to related constructs (e.g., Rothenberg et al., 2015). Fourth, the current study did not take into account the severity of AUD diagnosis. However prior work has demonstrated the risk for negative child outcomes are largely indicated by the parents' lifetime diagnosis of alcoholism rather than more proximal indicators of severity of parent alcohol related consequences (Hussong et al., 2010; Hussong et al., 2012) so we maintained our focus on this risk indicator in the current manuscript.

Future studies could investigate whether taking on certain roles in the family (primary caretaker versus breadwinner) impact which parents' marital dissatisfaction is most predictive of adolescent reports of conflict across time within families. Additionally, emerging research indicates that family conflict demonstrates continuity across generations (Rothenberg et al., 2015). Future investigations could explore adolescent-perceived family conflict and accompanying psychopathology as a mediator of, and marital dysfunction as a moderator of, such intergenerational continuity. As these unstudied clinical and etiological questions indicate, much work remains to be done. Nonetheless, this study represents a significant step in investigating how family conflict changes over time in both COA and non-COA families by identifying the form and direction of adolescent-perceived family conflict trajectories over time, highlighting the mediating role of marital dissatisfaction on the relationship between parent alcoholism and family conflict, and demonstrating that differences in marital dissatisfaction predict differences in adolescent-perceived conflict both between and within families.

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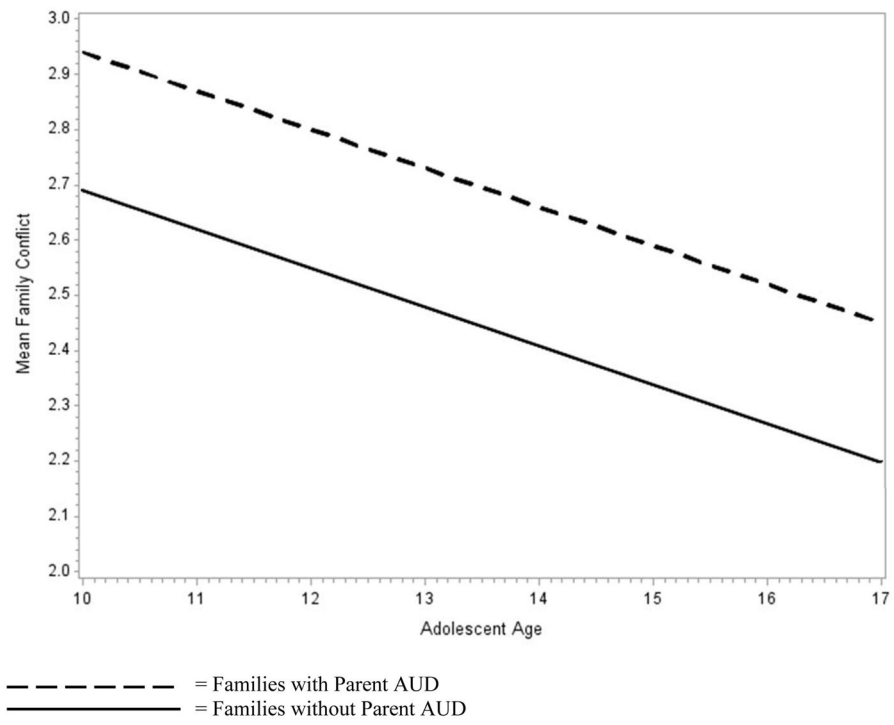


Figure 1. Differences in adolescent-reported family conflict in families with versus without a parent alcohol use disorder (AUD).

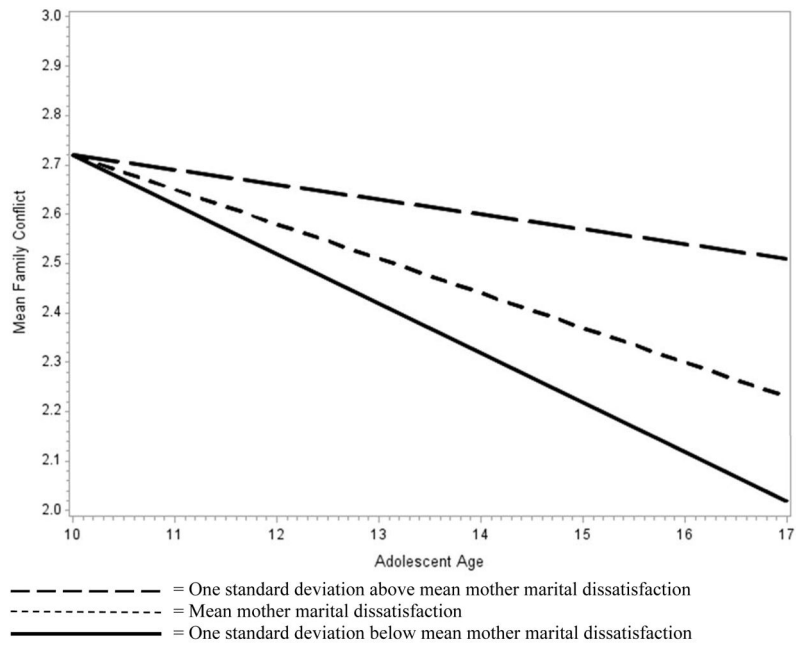


Figure 2. Differences in adolescent-reported family conflict in families with low, medium, and high mother marital dissatisfaction.

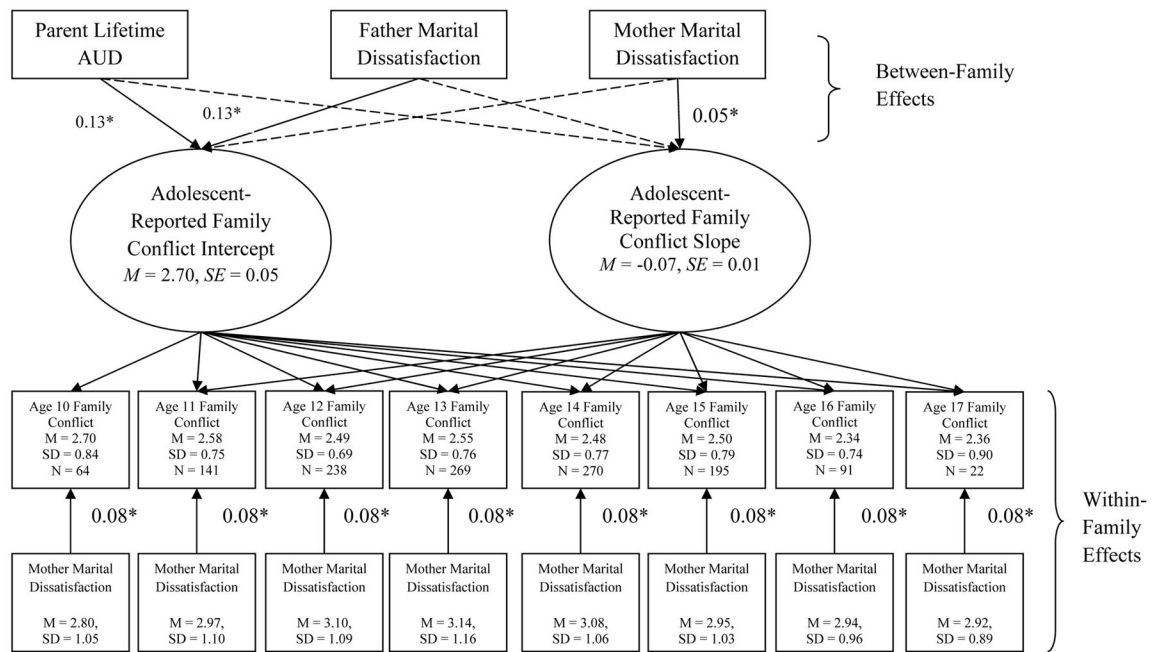


Figure 3. Conceptual model depicting conditional trajectories of family conflict. Modeled but non-significant paths indicated by dashed lines, all coefficients are standardized. Within family-effect is fixed and therefore equivalent across all time points. * $p < .05$.

Table 1

Correlation matrix of key predictor and outcome variables

	% or M (SD)	1	2	3	4	5	6
1. Adolescent Age at Wave 1	13.24(1.65)	1.00					
2. Parent Gender (% Male)	53%	0.00	1.00				
3. Parental Substance Use Diagnosis (% AUD)	54%	-0.02	-0.04	1.00			
4. Mother-Reported Marital Dissatisfaction [†]	3.09(0.98)	0.03	-0.02	0.32*	1.00		
5. Father-Reported Marital Dissatisfaction [†]	2.92(0.82)	0.01	-0.01	0.25*	0.54*	1.00	
6. Adolescent-Reported Family Conflict [†]	2.52(0.64)	-0.02	-0.05	0.20*	0.29*	0.27*	1.00

Note: Correlations computed from full 435 family sample before multiple imputation for missing data occurred.

* p < .05

[†] Averaged across all available time points for which data was available.

Table 2

Within- and between-family predictors of adolescent-perceived family conflict

Predictor	Model 1						Model 2									
	Intercept			Slope			Intercept			Slope			Time-Specific Effect			
	β	95% CI	t-value	β	95% CI	t-value	β	95% CI	t-value	β	95% CI	t-value	β	95% CI	t-value	
Between-Family Effects																
Parent AUD	0.25	(0.13, 0.37)	4.16 ^{***}	0.05	(0.00 – 0.10)	1.64	0.13	(0.01, 0.25)	2.10 [*]	--	--	--	--	--	--	--
Child Gender	-0.06	(-0.18, 0.06)	-0.98	0.00	(-0.06 – 0.05)	-0.07	-0.05	(-0.16, 0.07)	-0.82	--	--	--	--	--	--	--
Mother-reported marital dissatisfaction	--	--	--	--	--	--	0.03	(-0.15, 0.15)	0.02	0.05	(0.02, 0.09)	2.79 ^{***}	--	--	--	--
Father-reported marital dissatisfaction	--	--	--	--	--	--	0.13	(0.04, 0.22)	2.75 ^{***}	0.01	(-0.03, 0.06)	0.49	--	--	--	--
Within-Family Effects																
Mother-reported marital dissatisfaction	--	--	--	--	--	--	--	--	--	--	--	--	0.08	(0.02, 0.13)	2.85 ^{***}	0.64
Father-reported marital dissatisfaction	--	--	--	--	--	--	--	--	--	--	--	--	0.02	(-0.04, 0.08)	0.64	0.64

Note:

* p < .05,

**

*** p < .01, bold indicates significant effect at p < .05.