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Early Childhood Risk and Protective Factors Predicting Resilience against Adolescent Substance Use

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Abstract

We examined associations between early childhood (first 3 years of life) risk and protective factors and resilience against adolescent substance use in a prospective sample of alcoholic and non-alcoholic families. We defined resilience as low or no substance use in the context of adversity (having a father with alcohol problems). The sample included 227 families recruited from birth records when children were 12 months old and followed longitudinally to 15–17 years of child ages (n = 182). Adolescents were grouped into 4 categories: Non-challenged (non-alcoholic parent, no adolescent substance use, n = 50), Troubled (non-alcoholic parent, adolescent substance use, n = 30), Resilient (alcoholic parent, no adolescent substance use, n = 36), and Vulnerable (alcoholic parent and adolescent substance use, n = 66). Multivariate analyses were used to examine group differences (resilient vs. vulnerable; non-challenged vs. troubled) in child and parent characteristics and family relationships domains. Children in the troubled group compared to non-challenged had lower effortful control and emotion-regulation, and those in the resilient group were more unadaptable or reactive to novelty compared to the vulnerable group. Parents of resilient compared to vulnerable children reported significantly lower alcohol symptoms and more partner aggression. Finally, fathers of resilient compared to vulnerable children were less

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aggravated with them in early childhood. Results highlight the importance of continuous measures of alcohol problems, early childhood functioning, and family characteristics for associations with adolescent risk and resilience.Passive gene-environment correlations may account for associations between parent alcohol problem severity and adolescent substance use.

Keywords

Children of alcoholics; partner conflict; adolescent substance use; fathers

Children of fathers with alcohol problems (COAs) are four to 10 times more likely to have clinically significant levels of alcohol problems themselves, to have earlier onset of drinking, and to progress from alcohol use to abuse more quickly (Chassin, Curran, Hussong, & Colder, 1997; Donovan, 2004). Developmental cascade models of risk (Dodge et al., 2009) and studies of COAs indicate that family experiences of COAs beginning in infancy may be associated with developmental processes culminating in underage drinking and substance use problems in later life (Zucker, 1976). While there have been many developmental studies of COAs since then, none (except studies of fetal alcohol syndrome) have spanned infancy through late adolescence except the Buffalo Longitudinal Study (Author citation, 2018; Author citation et al., 2016; see Michigan Longitudinal Study for COA study beginning at preschool age). Results from this study support a cascade model of risk beginning in infancy and delineate two developmental pathways to adolescent substance use (Author citation et al., 2016), one via the parent-child relationship and another via child temperament characteristics. However, early childhood (0 – 3 years of age) predictors of resilience against adolescent substance use among COAs have yet to be examined.

The concept of resilience has been operationalized in several different ways (see Luthar & Zelazo, 2003). We conceptualized resilience as reflecting a process of resilient adaptation. As such, resilience was inferred based on absence of adolescent substance use under condition of risk – having at least one parent with alcohol problems. Our definition follows that of Rutter (2012), with resilience defined not as a fixed attribute of an individual that can be measured directly, but rather as reflecting an absence of a significant risky behavior (i.e., adolescent substance use) often exhibited by others experiencing the same risk condition – COA status.

Domains of Functioning

Based on previous studies of resilience (Heitzeg, Nigg, Yau, Zubieta, & Zucker, 2008; Masten, 1994; Moe, Johnson, & Wade, 2007; Pearson, D'Lima, & Kelley, 2011; Wong et al., 2006; Zucker, Wong, Puttler, & Fitzgerald, 2003), we examined associations between three domains of functioning in early childhood and resilience in adolescence: child characteristics, parent characteristics, and the relationship domain. Among child characteristics, child temperament and self-regulation have been noted as being protective across several studies (Masten, 1994) including studies of resilience among COAs beginning at preschool age (Zucker et al., 2003). The construct of difficult temperament or high reactivity in early childhood is a risk factor for a number of outcomes across development (e.g., Kiff, Lengua, &Zalewski, 2011) and may differentiate resilient from vulnerable

children. The related construct of self-regulation has been defined as the shift from external to internal regulation that enables the child to conform to societal standards that restrain antisocial and destructive impulses. Both emotional (emotion modulation in the context of task performance) and behavioral regulation (e.g., effortful control) and internalization of rules of conduct at preschool age have been implicated as causal processes in the pathway from parents' alcohol problems to adolescent substance use via externalizing symptomatology (Eiden, Foote, & Schuetze, 2007; Eiden et al., 2016) and generally protective for later risk behaviors (Eisenberg et al., 1996). Indeed, difficult temperament and low self-regulation may not only differentiate between resilient and vulnerable children of alcoholic fathers, but also differentiate children of non-alcoholic fathers who engage in underage drinking and substance use from those who do not (Wills & Dishion, 2004). While low self-regulation increases risk for this negative developmental cascade, high self-regulation may be protective against continuity of externalizing problems to adolescent substance use. This continuity of externalizing behavior is one of the most robust predictors of adolescent substance use in COA and non-COA samples (Colder et al., 2013; Hussong, Huang, Curran, Chassin, & Zucker, 2010; Jester et al., 2008; Timmermans, van Lier, & Koot, 2008).

Among parent characteristics, parent alcohol problems and levels of heavy drinking as well as associated symptoms of antisocial behavior and depression have been implicated as risk factors for child outcomes in previous studies of COAs (e.g., Zucker et al., 2003). Given high rates of and partner influences on drinking across marriage (Kendler, Larrson, Salvatore, Sundquist, & Sundquist, 2018), maternal and paternal alcohol problems often co-occur and having two parents with alcohol problems may increase risk for adolescent substance use. This may be due to increased genetic risk suggesting potential direct effects on adolescent substance use, and/or via alternate pathways such as poor child self-regulation and higher externalizing behavior problems leading to higher adolescent substance use (Eiden et al., 2016; Hussong, Cai, et al., 2008; Jaffee, Strait, & Odgers, 2012). In addition, fathers' alcohol problems often occur in the context of higher paternal antisocial behavior and in the context of higher maternal and paternal depression (Cloninger, Sigvardsson, & Bohman, 1988; Eiden, 2018; Fitzgerald & Eiden, 2007; Hussong, Flora, Curran, Chassin, & Zucker, 2008). When fathers' alcohol problems occur in the absence of these other parental risks, they may be less detrimental to child functioning. The risk factors of parents' antisocial behavior and depression may also be present in the absence of fathers' alcohol problems and differentiate between children of non-alcoholic fathers who engage in adolescent substance use compared to those who do not (see Eiden, 2018).

Finally, in the relationship domain, parent-child as well as parent-parent relationships can function as risk or protective factors for a myriad of child outcomes (Davies & Cummings, 1994; Parke, Cassidy, Burks, Carson, &Boyum, 1992). Indeed, the quality of the mother-child relationship is particularly protective in families with fathers who have alcohol problems (Eiden, Edwards & Leonard, 2007; Eiden, 2018; Eiden et al., 2016). Maternal warmth and sensitivity in early childhood is of critical importance, with enduring protective effects throughout development (Haltigan, Roisman, & Fraley, 2013; Raby, Roisman, Fraley, & Simpson, 2015). The potentially enduring effects of paternal sensitivity for adolescent substance use outcomes, especially in samples consisting of fathers with clinically

significant levels of alcohol problems, have been understudied. However, variable centered analyses from the current sample indicate significant associations between maternal and paternal warmth and sensitivity in early childhood, but only maternal warmth and sensitivity accounted for unique variance in child problems (Author citation, 2016). The protective role of parental warmth sensitivity may operate even in the absence of fathers' alcohol problems as noted in general developmental studies (Haltigan et al., 2013; Raby et al., 2015).

In addition to the parent-child relationship, the importance of the relationship between parents has been highlighted by several theories such as the ecological theory (Bronfenbrenner, 1977), relational developmental systems theory (Belsky, Lerner, & Spanier, 1984), and family systems theories (Cox & Paley, 2003; Cummings, Davies, & Campbell, 2000) as having a significant influence on the parent-child relationship as well as child health and development. Intimate partner relationship quality may directly impact children through observations of negative and positive aspects following social learning theory (Bandura, Ross, & Ross, 1961), by producing child distress (Cummings, Pellegrini, Notarius, & Cummings, 1989), or indirectly through potential spillover into parent-child interactions (Cox & Paley, 2003; Repetti, Taylor, & Seeman, 2002). Past research provides support for direct associations and indicates moderate associations between intimate partner relationships and quality of parenting (Erel & Burman, 1995; Krishnakumar & Buehler, 2000). Thus, the intimate partner context may be a significant source of influence in developmental processes leading to adolescent substance use and may either increase vulnerability or promote resilience.

Present Study

Using the Buffalo Longitudinal Study sample, we examined group differences on early childhood risk and protective factors during the first three years of life across three domains of functioning: child characteristics (i.e., temperament, self-regulation), parent characteristics (i.e., psychopathology, continued substance use), and the relationship domain (i.e., parent-parent and parent-child relationships). We were primarily interested in examining differences between children with alcoholic fathers who were resilient (following the above definition) compared to those who were vulnerable; and between children with non-alcoholic parents who engaged in substance use compared to those who had not. We hypothesized that resilient children would have lower levels of parental and child risks, and be more likely to have experienced warm, sensitive parenting in early childhood and less likely to be exposed to intimate partner conflict compared to vulnerable children. Among non-alcoholic families, we hypothesized that troubled children (those with substance use) would be more likely to have experienced these risks compared to those with no substance use.

Methods

Participants

The sample included 227 families (116 girls, 111 boys; 102 non-alcoholic group; 125 father alcoholic with 30 mothers who were heavy drinking or had current alcohol problems; no heavy drinking in pregnancy) recruited from birth records when children were 12 months

old. The majority were White (94% of mothers and 87% of fathers), more than half of the mothers (59%) and fathers (54%) had completed some post–high school education; annual family income ranged from $4,000 to $95,000 at recruitment, with the mean income $41,824 (*SD* = $19,423), all were co-habiting and most were married to each other (88%). Mothers' age at recruitment ranged from 19 to 41 years (*M* = 30.7, *SD* = 4.5) and the fathers' age ranged from 21 to 58 years (*M* = 33.0, *SD* = 5.9). Group differences in demographics are reported in Table 1. There were no differences in gender distribution among the groups (52%, 43%, 50%, 47% were boys in the nonchallenged, troubled, resilient, and vulnerable groups respectively).

Procedures

New York State birth records were examined for initial exclusion and inclusion criteria (1996–1998). The initial exclusion criteria included: premature birth (i.e., less than 36 weeks gestation), low birthweight (i.e., less than 2,500 grams), maternal age less than 18 or greater than 40 years at the time of birth, plural birth, and infants suffering from palsies, congenital abnormalities, or symptoms of drug withdrawal. Families meeting initial eligibility criteria were initially screened via mail and then screened via telephone for additional eligibility criteria carefully selected for their potential to significantly impact dyadic parent-child interactions: parent cohabitation since the child's birth, infant being the youngest child in the family, mother not pregnant at time of recruitment, infant not separated from mother for more than one week, biological parents were the infant's primary caregivers, and the infant did not have any major medical problems that would preclude them from participating. Families were also excluded if the mother reported any drug use (other than mild marijuana use; no more than twice during pregnancy), any instances of binge drinking (5 or more drinks on one occasion) or consuming more than 1 drink a day during pregnancy. Control and alcoholic groups were matched on race/ethnicity, maternal education, parity, marital status, and child sex (see Author citation, 1999; Author citation et al., 2007 for procedural details).

Observational and parent report assessments at 12, 18, 24, and 36 months of child age (averaged to form composite scales), and child report assessments at 15–17 years of child ages were included in analyses. Of the 227 families that provided data at the 12-month visit, 227 (100%) also provided data at 18 months, 222 (98%) provided data at 24 months, 205 (90%) provided data at 36 months, and 182 (81%) at 11/12th grade. There were no group differences between families with missing versus complete data on any of the alcohol variables included in these analyses. However, families with missing data had mothers who reported higher antisocial behavior compared with those with complete data (*Ms* = 41.96 and 39.25, *SDs* = 10.01 and 8.54, *Cohen's d* = .29). Although it is clear that data were not missing completely at random, the overall effect size for this group difference was in the small range, and data did meet criteria for being missing at random (MAR; Little & Rubin, 1989). The procedures were approved by the University at Buffalo Institutional Review Board.

Measures

Child Characteristics (see Table 2 for reliability coefficients)

Temperament: The 13-and-24-month versions of the Infant Characteristics Questionnaire (ICQ; Bates, Freeland, & Lounsbury, 1979), a self-report measure with 32 items that were rated on a 7-point scale completed by both parents were used to measure infant/toddler temperament. Mother and father report at 12, 18, 24 months were averaged to create a composite score for each of the subscales: fussy/difficult (e.g., how easy or difficult is it for you to calm or soothe your baby when he/she is upset) and unadaptable/reactive to novelty (e.g., how does your baby typically respond to being in a new place). The other two subscales had lower internal consistency and were excluded from analyses.

Self-regulation: Three measures of self-regulation were used in analyses from measures administered at 24 months of child age (Author citation, 2007; Kochanska & Knaack, 2003): an effortful control battery, an observational measure of internalization of maternal rules, and an observational measure of internalization of fathers' rules. The effortful control battery consisted of a battery of tasks developed by Kochanska, Padavich, and Koenig (1996) and Kochanska and Knaack (2003) and consisted of three tasks: a snack delay, a whisper, and a lab gift (see author citation blinded for review for details). Following previous studies (e.g., Kochanska, Murray, & Coy, 1997; Kochanska, Murray, & Harlan, 2000), a composite score for effortful control was created by standardizing and averaging across the three measures. Observations of child internalization were conducted following the "don't touch" paradigm developed by Kochanska and her colleagues (Kochanska & Aksan, 1995; Kochanska, Murray, Jacques, Koenig, &Vandegeest, 1996) and was identical for mothers and fathers (see Author citation et al., 2007 for details). This 12-minute paradigm assessed children's internalization of the parental rule to not touch objects on a prohibited shelf. Children's behavior was coded for every 15-second interval on a 0–5 scale following criteria developed by Kochanska and Aksan (1995), with high scores reflecting high levels of internalization of parental rules of conduct.

Emotion regulation: Child emotion regulation was assessed at 24 months using the Behavior Rating Scale (BRS) of the Bayley Scales of Infant Development – II (BSID-II; Bayley, 1993). Examiners administering the BSID-II then completed the BRS after completion of test administration. The BRS is a 30-item scale with ratings of children's attention/arousal, orientation/engagement, emotion regulation, and motor quality. The emotion regulation subscale was used in the present analyses. Examiners were blind to group status and higher scores indicating higher levels of emotion regulation. Bayley-II validation samples have demonstrated moderate to high internal consistency (Cronbach's α = .73 to .90) as well as test-retest reliability scores ranging from .61 to .71 (Bayley, 1993).

Parent Characteristics

Antisocial behavior: Antisocial behavior was assessed using a modified version of the self-report Antisocial Behavior Checklist (ASB; Ham, Zucker, & Fitzgerald, 1993; Zucker & Noll, 1980) at 12 months of child age. The ASB is a measure of lifetime antisocial behavior and thus this measure was not administered at any subsequent time point. Parents rated the

frequency of their participation in various aggressive and antisocial behaviors during their lifetime on a scale ranging from 1 (never) to 4 (often) for 28 items (see Author citation et al., 2016 for details).

Depression: Mothers' and fathers' depressive symptoms were measured using the Center for Epidemiological Studies Depression scale (CESD; Radloff, 1977), a 20 item self-report scale designed to measure depressive symptoms in community samples. Higher scores reflect higher levels of depressive symptoms. Depression was assessed at 4 time points (12, 18, 24, and 36 months of child age), which were then averaged across time for both mother and father separately. Depression was fairly stable, with across time correlations ranging from .47 to .66 for maternal depression and .49 to .72 for paternal depression. The CESD has demonstrated high internal consistency (Radloff, 1977) and strong test–retest reliability (Boyd, Weissman, Thompson, & Myers, 1982; Ensel, 1982).

Parents' alcohol use: A self-report measure adapted from the University of Michigan Composite International Diagnostic Interview (Anthony, Warner, & Kessler, 1994; Kessler et al., 1994) assessed issues with parental alcohol abuse and dependence. Several questions were reworded to determine "how many times" a problem had been experienced, as opposed to whether it happened "very often". The UM-CIDI is a widely used diagnostic interview designed to assess substance abuse and dependence with high inter-rater, test-retest reliability, and good validity with regard to concordance with clinical diagnoses (see Kessler, 1995).The quantity-frequency of alcohol use (Quantity Frequency Index; Cahalan, Cisin, & Crossley, 1969) and frequency of binge drinking (5 or more on a single occasion) were also assessed.

Relationship Domain

Partner conflict: Partner conflict was measured using mothers and fathers' self-reports on the Conflict Tactics Scale (CTS; Straus, 1979). The current study utilized items focusing on moderate (e.g., shoved or grabbed) to severe (e.g., hit with fist) physical aggression, but not the very severe items (e.g., burnt or scalded, use of weapons). Parents reported both the frequency of their own physical aggression towards their partner as well as their partners' physical aggression towards them over the past 12 months on a seven-item scale ranging from 0 (0 times) to 6 (20 or more times). Indicators of each variable were created by taking the maximum of the mother and father reports following previous studies (Eiden, Molnar, Colder, Edwards, & Leonard, 2009). The maximum of mother or father report from each of the 4 time points (i.e., 12, 18, 24, and 36 months) was then averaged into two composite measures to indicate mother to father aggression and father to mother aggression averaged over time points. Data were converted using square root transformations because of the skewed distribution of scores.

Partner satisfaction: The Marital Adjustment Test (MAT; Locke & Wallace, 1959; O'Leary & Turkewitz, 1978) assessed partner satisfaction. The MAT is a 15-item scale with a variety of response scales. This measure has been found to differentiate satisfied couples from distressed couples (Locke & Wallace, 1959) and has demonstrated adequate psychometric properties in past research (Kimmel & Van Der Veen, 1974). A composite was again created

for maternal and paternal partner satisfaction separately from measures at 12, 18, 24, and 36 months.

Parental Aggravation: Maternal and paternal aggravation with their child was measured using the aggravation subscale of the Parental Attitude toward Child Rearing (PACR; Easterbrooks & Goldberg, 1990; Easterbrooks & Goldberg, 1984) at 12, 18, 24, and 36 months of child ages. Parents rated each item on a 6-point scale ranging from 1 (low) to 6 (high). A composite measure of maternal and paternal aggravation was computed by taking the average of the aggravation subscale across time.

Parent-child interactions: At the 12, 18, and 24-month appointments, parents were asked to interact with their infants as they normally would at home for a period of 5 minutes in a room filled with age appropriate toys (free play). These free-play interactions were followed by a 5-minute clean-up session and 8 minutes of structured play. For the structured play sessions, families were provided with a series of four problem solving tasks. Parents were asked to help their children complete the tasks one at a time before moving to the next task. Mother-child interactions were conducted first, and father-child sessions were conducted within 2–4 weeks. These interactions were coded using the Parent-Child Relational Assessment tool, a collection of global 5-point rating scales (Clark, Musick, Scott, & Klehr, 1980; Clark, 1999). Coders blind to group status scored the dyadic interactions on a 5-point global rating scale. Two individuals holding Bachelor's level degrees with experience in child development and observational coding of parent–child interactions coded the free-play sessions after the completion of the laboratory visits. The coding of maternal and paternal behavior was alternated between the two coders so one coder would never code both the mother and father interactions within any individual family. The coders were trained on the Clark scales by the first author until they achieved at least 80% reliability. A minimum of 15% of the observations were randomly selected for inter-rater reliability checks. For parent–infant interactions at 12, 18, and 24 months, inter-rater reliability was calculated for 17% of the sample ($n = 38$) and was high, with intra-class correlation coefficients ranging from .80 to .92.

Resilience: All substance use measures used in these analyses were assessed in the late adolescent wave. Alcohol use was assessed with two items that assessed on how many days in the last month that the adolescent had a drink, and how many drinks per drinking day did the adolescent have. These questions were based on the Youth Risk Behavior Surveillance Survey (YRBS, Grunbaum, Lowry, & Kann, 2001). Marijuana use was assessed with a one item question "In the last 30 days, how many times have you tried marijuana?", with response options ranging from 1 = Never to 7 = 40 or more times (Substance Abuse and Mental Health Services Administration, 2007). Other drug use was assessed with a composite of 20 questions assessing individual drug use such as "In the last 30 days, how many times have you tried LSD?", with response options ranging from 1 = Never to 7 = 40 or more times (Substance Abuse and Mental Health Services Administration, 2007).

We used the adolescent binge drinking criterion to differentiate groups given that some level of experimentation with alcohol use is normative in adolescence (Brown et al., 2008), while adolescent binge drinking has been associated with more serious harmful consequences such

as risky sex, alcohol poisoning, injuries, and accidents due to acute intoxication (Hingson & White, 2014). Adolescents who were binge drinking on at least 3 or more occasions in the past month between the ages of 15–17 years were also more likely to follow a pattern of problematic use into young adulthood (Chassin, Pitts, & Prost, 2002). In addition, adolescents using any illicit substances were classified as having substance use risk since they are associated with high risk of adverse outcomes such as health risks and injury, dropping out of school, and involvement with the criminal justice system (Centers for Disease Control, 2018). Thus, adolescents who reported having used marijuana or any illicit substances and engaged in excessive drinking (3 or more drinks at least 3 days in the past month, following National Institute on Alcohol Abuse and Alcoholism (NIAAA) binge drinking criteria) were classified in the risk groups. Resilience was defined as no substance use risk even in the context of having at least one parent with alcohol problems.

Analytic Strategy

MANOVAs were used to examine group differences in three domains of functioning: child characteristics (i.e., temperament, self-regulation), parent characteristics (i.e., psychopathology, continued substance use), and relationships (i.e., parent-parent relationship, parent-child relationship) measured in early childhood. The independent variable in each MANOVA was the group status with four levels (non-challenged, troubled, resilient, vulnerable) and the dependent variables were those within each domain of functioning with the exception of parent aggravation variables that were analyzed separately with ANOVA since they did not fit with parent-child interaction variables. Planned contrasts focused primarily on differences between those children who were resilient compared to those who were vulnerable (both COAs but without and with substance use in adolescence), or differences between those who were non-challenged compared to those who were troubled (both non-COAs, but without and with substance use in adolescence).

Results

Group Assignment

Adolescents were first classified as having substance use risk vs. not based on criteria described above. Based on the substance use risk criteria and COA status, adolescents were grouped into 4 categories: Non-challenged (non-alcoholic parent, no substance use, $n = 50$), Troubled (non-alcoholic parent, substance use, $n = 30$), Resilient (alcoholic parent, no substance use, $n = 36$), and Vulnerable (alcoholic parent and substance use, $n = 66$). As reported in Table 1, there were no demographic differences between the groups of interest (non-challenged vs. troubled and resilient vs. vulnerable) and thus the demographic variables were not used as covariates. There were no significant differences in gender distribution across groups, 52%, 43%, 50%, and 47% of children were boys in the non-challenged, troubled, resilient, and vulnerable groups respectively.

Group Analyses

Child characteristics—MANOVA with the two subscales of the ICQ revealed significant group difference on unadaptable temperament (see Table 3). Children in the resilient group were perceived as more unadaptable (reactive to novelty) compared to vulnerable group (see

Table 3). Emotion regulation and effortful control at 24 months differentiated the non-challenged and troubled groups, such that the troubled group had lower ratings of emotion regulation and exhibited lower levels of effortful control at toddler age.

Parent characteristics—In the parent characteristic domain, the resilient group had fathers and mothers with significantly lower alcohol symptoms in early childhood compared to the vulnerable group (see Table 4). None of the other variables differentiated between groups.

Relationship domain—In the relationship domain, the resilient group tended ($p = .057$) to experience lower levels of father to mother conflict compared to the vulnerable group (see Table 5). In addition, fathers of resilient children were less aggravated with them in early childhood compared to fathers with vulnerable children. There were overall group differences among several other relationship domains (see Table 5), but these differences were driven by differences between COA vs. non-COA families.

Discussion

We prospectively examined associations between risk and protective factors during early childhood predicting resilience against adolescent substance use in a sample of alcoholic and non-alcoholic families across three domains of functioning: child characteristics, parent characteristics, and the relationship domain. We focused our analyses on differences between children who were resilient (no/low adolescent substance use) compared to vulnerable (adolescent binge drinking or other substance use in past month) in the context of having at least one parent with alcohol problems, and between children who were non-challenged (no substance use, no alcoholic parent) compared to troubled (substance use, but no alcoholic parent). Overall, results suggested that children in the resilient group had experienced reduced severity of parental alcohol problems and less father to mother aggression in early childhood. In contrast, children in the troubled group exhibited lower levels of emotion regulation and effortful control in early childhood. Results may be interpreted as supporting the importance of continuous measures of parental, child, and family risk in early childhood instead of categorical dichotomies of alcoholic vs. non-alcoholic families. The current findings indicate that variables associated with adolescent substance use risk and resilience may differ by level of family risk.

There were overall few differences between children in the resilient group and those in the vulnerable or non-challenged groups with the exception of those who were unadaptable or more reactive to novelty. Children in the resilient group were perceived by parents as more unadaptable (or reactive to novelty) during early childhood. Although unadaptable temperament characterized by high reactivity to novelty in early development is often considered a risk factor for later behavioral and substance use outcomes, this reactivity may reflect passive and evocative gene-environment correlations or may have elicited additional caregiving within a disrupted and unpredictable family environment posed by parent (mostly fathers) alcohol problems. Indeed, children who are highly reactive may have differential susceptibility to the influences of their environment and may especially benefit from positive parenting (Belsky, 2013; Kiff et al., 2011). In past work with this sample, a secure

attachment relationship with mothers was protective against the development of externalizing behavior problems in early childhood (Author citation, 2006). While we did not examine interactive effects of high reactivity and parenting for prediction of resilient compared to vulnerable children, this may be a direction for future research.

In contrast to results regarding differences between resilient vs. vulnerable, among non-COA adolescents, the troubled group had lower ratings of emotion regulation and lower effortful control at 24 months than the non-challenged group. This is consistent with past work suggesting the risk posed by poor emotion regulation and effortful control for later developmental outcomes generally (Eisenberg et al., 1996, 2000). Emotion regulation and effortful control did not differentiate between resilient and vulnerable children. However, these variables have been associated with parent alcohol problems indirectly via less sensitive parenting in infancy and have been predictive of a cascade of risk processes in later development (see Eiden, 2018; Eiden et al., 2016). Unlike other studies of COAs (e.g., Clark, Hyde, Essex, & Klein, 1997), our results do not suggest a pattern of differences on child characteristics differentiating between children within the alcohol group other than parent reports of unadaptable temperament. Prior studies have often noted sex differences in child characteristics among children of alcoholics (e.g.,Carbonneau et al., 1998). More nuanced examination of potential differences between resilient and vulnerable children among boys and among girls separately may be more informative in this regard. We were not adequately powered in this study to examine if there were gender differences in the association between the early childhood variables and substance use risk/resilience in this sample. This may be a useful direction for future studies with larger sample sizes or data integration across multiple longitudinal studies of such cohorts.

Although several parent characteristics, including depression, antisocial behavior, and alcohol use and problems, were examined, only fathers' and mothers' alcohol problems differentiated resilient from vulnerable children. Children in the resilient group had fathers and mothers with lower alcohol symptoms during early childhood than vulnerable group. The severity of alcohol problems, which reflect not only higher use but also potential alcohol dependence and distinct impairment in functioning, may create a greater risk context for adolescent substance use. This may also reflect a greater genetic loading for alcohol related disorders. This finding adds to past research (Chassin et al., 1997; Donovan, 2004) on the risk for substance use problems of COAs by highlighting the central nature of the severity of parent alcohol problems in predicting risk vs. resilience among COAs. This suggests that harm reduction approaches focused on reducing risky drinking and dependence among parents with alcohol problems in early childhood may partially mitigate intergenerational transmission of substance use risk. Other parental psychopathology did not distinguish between resilient vs. vulnerable groups, suggesting alcohol specific effects.

In the relationship domain, the resilient group tended to have parents with lower levels of father to mother conflict compared to the vulnerable group. These results may be viewed in the context of the results on severity of alcohol problems also discriminating between these two groups. Previous results have demonstrated the strong associations between fathers' alcohol problems and family conflict, and the direct as well as spillover effects of family conflict onto parenting processes and child outcomes such as social competence (e.g.,

Finger, Eiden, Edwards, Leonard, &Kachadourian, 2010). Our current results indicate that these associations may be long lasting, and may create a context for risky adolescent behaviors. Children in the resilient group also had fathers who were less aggravated with them in early childhood compared to vulnerable children. Overall, fathers exhibiting less aggression towards their partners and aggravation towards their children during early childhood was associated with resilience for adolescent substance use even in the context of COA risk. Aggression, conflict, and aggravation behaviors may create an enhanced perception of emotional insecurity (e.g., Davies & Cummings, 1994) as well as a parenting and interaction pattern that models dysregulated and maladjusted behaviors. High levels of family conflict and fathers' aggravation with their children may also pose a situation of threat increasing risk for impaired social-emotional learning and externalizing problems (Miller et al., 2018), consistent with recent theories conceptualizing early childhood adversity along the dimensions of threat and deprivation (McLaughlin & Sheridan, 2016). Future research with genetically informed designs may examine if reducing parental alcohol abuse and dependence symptoms and enhancing the couple relationship in early childhood may have cascading protective effects for children of alcoholics with high genetic risk for substance use problems.

Limitations and Future Research

The present study focused on several domains of early childhood predictors of risk and resilience for adolescent substance use. However, our threshold for adolescent substance use was not set at a severe or highly problematic level. Our choice of this cut-off was driven by the need to balance ascertainment of risk (3 or more drinks on one occasion considered to be binge drinking among adolescents) with sufficient sample size within each group but may not be replicable if other samples use lower or higher risk cut-offs. Studies have noted that adolescents who were binge drinking on at least 3 or more occasions in the past month between the ages of 15–17 years were also more likely to follow a pattern of problematic use into young adulthood (Chassin, Pitts, & Prost, 2002). However, the cut-off for binge drinking was more stringent in these studies (5 drinks or more). Our current definition of binge drinking was based on more recent definitions by NIAAA. Future studies with larger sample sizes may be needed to see if results replicate with the same and with different cut-offs that allow for experimental use of illicit substances and have higher binge drinking criteria. Future research may also want to consider the larger sociocultural context of the family, as families with parents with alcohol problems may also create a context supportive of alcohol problems even at an early age, such as availability of alcohol and allowing children to sip and taste alcohol at an early age (Colder et al., 2018). In addition, there were a number of differences between families in the alcohol compared to the control group. However, examining group differences between alcoholic and non-alcoholic families was not the primary goal of the current paper and many of these differences have been reported previously (see Author citation et al., 2006; Author citation et al., 2009; 2016; Author citation, 2018). In addition, families with more missing data across time had mothers with higher levels of antisocial behavior, and it is unclear how the results may have differed if there were no group differences between families with missing vs. complete data in the adolescent wave. Finally, we did not have a genetically informed design and as such, are unable to disentangle genetic from environmental associations or make causal inferences.

Future studies with randomized control designs targeting harm reduction strategies in early childhood for fathers' with alcohol problems may be more informative in this regard.

Conclusion

In conclusion, while this design does not allow for causal inferences, future studies may target reducing parental alcohol symptoms and enhancing the couple relationship in early childhood (first 3 years of life) to examine potential protective effects against underage drinking and substance use among children of alcoholic fathers. Intervention and prevention efforts may emphasize not only reduction in alcohol problems but also co-parenting to enhance positive parenting practices that may also enhance partner relationships and promote child regulation in experimental designs that may better address the issue of causation. Finally, given group differences in child temperament and self-regulation, parental strategies that may help promote self-regulation in the toddler to preschool years may examine if there are causal associations with promoting positive outcomes even among children who are at low risk.

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References

Anthony JC, Warner LA, & Kessler RC (1994). Comparative epidemiology of dependence on tobacco, alcohol, controlled substances, and inhalants: Basic findings from the National Comorbidity Survey. Experimental & Clinical Psychopharmacology, 2, 244–268.

Bandura A, Ross D, & Ross SA (1961). Transmission of aggression through imitation of aggressive models. Journal of Abnormal and Social Psychology, 63(3), 575–582. [PubMed: 13864605]

Bates JE, Freeland CAB, & Lounsbury ML (1979). Measurement of infant difficultness. Child Development, 50, 794–803. [PubMed: 498854]

Bayley N (1993). The Bayley Scales of Infant Development (Vol. 2nd). New York: The Psychological Corporation.

Belsky J (2013). Differential Susceptibility to Environmental Influences. International Journal of Child Care and Education Policy, 7(2), 15–31. doi:10.1007/2288-6729-7-2-15

Belsky J, Lerner RM, &Spanier GB (1984). The child in the family: Addison-Wesley/Addison Wesley Longman.

Boyd JH, Weissman MM, Thompson WD, & Myers JK (1982). Screening for depression in a community sample: Understanding the discrepancies between depression syndrome and diagnostic scales. Archives of General Psychiatry, 39(10), 1195–1200. [PubMed: 7125849]

Bronfenbrenner U (1977). Toward an experimental ecology of human development. American Psychologist, 32, 513–531.

Brown SA, McGue M, Maggs J, Schulenberg J, Hingson R, Swartzwelder S, Martin C, Chung T, Tapert S, Sher K, Winters KC, Lowman C, & Murphy S (2008). A developmental perspective on alcohol and youths 16 to 20 years of age. Pediatrics, 121 Suppl 4(Suppl 4), S290–S310. [PubMed: 18381495]

Cahalan D, Cisin IH, & Crossley H (1969). American drinking practices: A national study of drinking, behavior and attitudes. New Brunswick, NJ: Rutgers Center of Alcohol Studies Monograph 1.

Carbonneau R, Tremblay RE, Vitaro F, Dobkin PL, Saucier JF, & Pihl RO (1998). Paternal alcoholism, paternal absence and the development of problem behaviors in boys from age six to twelve years. Journal of Studies on Alcohol, 59(4), 387–398. [PubMed: 9647421]

Centers for Disease Control and Prevention, Division of Adolescent and School Health, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. (2018). Youth Risk Behavior Survey Data Summary & Trends Report, 2007–2017. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Office of Infectious Diseases, NCHHSTP.

Chassin L, Curran PJ, Hussong AM, & Colder CR (1997). The relation of parent alcoholism to adolescent substance use: A longitudinal follow-up study. In Marlatt GA, VandenBos GR, Marlatt GA, & VandenBos GR (Eds.), Addictive behaviors: Readings on etiology, prevention, and treatment. (pp. 509–533). Washington, DC, US: American Psychological Association.

Chassin L, Pitts SC, Prost J. (2002). Binge drinking trajectories from adolescence to emerging adulthood in a high-risk sample: Predictors and substance abuse outcomes. Journal of Consulting and Clinical Psychology, 70(1), 67–68. [PubMed: 11860058]

Clark R, Hyde JS, Essex MJ, & Klein MH (1997). Length of maternity leave and quality of mother-infant interactions. Child Development, 68, 364–383. [PubMed: 9180007]

Clark R (1999). The Parent-Child Early Relational Assessment: A Factorial Validity Study. Educational and Psychological Measurement, 59(5), 821–846.

Clark R, Musick J, Scott F, &Klehr K (1980). The mothers' project rating scale of mother-child interaction.

Cloninger CR, Sigvardsson S, &Bohman M (1988). Childhood personality predicts alcohol abuse in young adults. Alcoholism: Clinical & Experimental Research, 12(4), 494–505.

Colder CR, Scalco M, Trucco EM, Read JP, Lengua LJ, Wieczorek WF, & Hawk LW Jr. (2013). Prospective associations of internalizing and externalizing problems and their co-occurrence with early adolescent substance use. Journal of Abnormal Child Psychology, 41(4), 667–677. doi:10.1007/s10802-012-9701-0 [PubMed: 23242624]

Colder CR, Shyhalla K, & Frndak SE (2018). Early alcohol use with parental permission: Psychosocial characteristics and drinking in late adolescence. Addictive Behaviors, 76, 82–87. [PubMed: 28772246]

Cox MJ, & Paley B (2003). Understanding families as systems. Current Directions in Psychological Science, 12(5), 193–196.

Cummings EM, Davies PT, & Campbell SB (2000). Developmental psychopathology and family process: Theory, research, and clinical implications. New York: Guilford Press.

Cummings JS, Pellegrini DS, Notarius CI, & Cummings EM (1989). Children's responses to angry adult behavior as a function of marital distress and history of interparent hostility. Child Development, 60, 1035–1043. [PubMed: 2805881]

D'Amico EJ, Ellickson PL, Collins RL, Martino S, & Klein DJ (2005). Processes linking adolescent problems to substance-use problems in late young adulthood. Journal of Studies on Alcohol, 66(6), 766–775. [PubMed: 16459938]

Davies PT, & Cummings EM (1994). Marital conflict and child adjustment: An emotional security hypothesis. Psychological Bulletin, 116(3), 387–411. [PubMed: 7809306]

Dodge KA, Malone PS, Lansford JE, Miller S, Pettit GS, & Bates JE (2009). A dynamic cascade model of the development of substance-abuse onset. Monogr Soc Res Child Dev, 73(3), 1–31.

Doherty WJ, & Needle RH (1991). Psychological adjustment and substance use among adolescents before and after a parental divorce. Child Development, 62(2), 328–337. [PubMed: 2055125]

Donovan JE (2004). Adolescent alcohol initiation: A review of psychosocial risk factors. Journal of Adolescent Health, 35(6), 529–529.

Easterbrooks M, & Goldberg W (1990). Parental attitudes toward childrearing (PACR). Handbook of family measurement techniques, 341–342.

Easterbrooks MA, & Goldberg WA (1984). Toddler development in the family: Impact of father involvement and parenting characteristics. Child Development, 740–752. [PubMed: 6734315]

Edwards EP, Eiden RD, & Leonard KE (2006). Behavior problems in 18-to 36-month-old children of alcoholic fathers: Secure mother-infant attachment as a protective factor. Development and Psychopathology, 18(2), 395–407. doi:Doi 10.1017/S0954579406060214 [PubMed: 16830441]

Eiden RD (2018). Etiological processes for substance use disorders beginning in infancy. In Fitzgerald HE & Puttler LI (Eds.), Alcohol Use Disorders: A Developmental Science Approach to Etiology: Oxford University Press.

Eiden RD, Edwards EP, & Leonard KE (2007). A conceptual model for the development of externalizing behavior problems among kindergarten children of alcoholic families: Role of parenting and children's self-regulation. Developmental Psychology, 43(5), 1187–1201. [PubMed: 17723044]

Eiden RD, Foote A, &Schuetze P (2007). Maternal cocaine use and caregiving status: Group differences in caregiver and infant risk variables. Addictive Behaviors, 32, 465–476. [PubMed: 16837139]

Eiden RD, Lessard J, Colder CR, Livingston J, Casey M, & Leonard KE (2016). Developmental cascade model for adolescent substance use from infancy to late adolescence. Developmental Psychology, 52(10), 1619–1633. doi:10.1037/dev0000199 [PubMed: 27584669]

Eiden RD, Molnar DS, Colder C, Edwards EP, & Leonard KE (2009). A conceptual model predicting internalizing problems in middle childhood among children of alcoholic and nonalcoholic fathers: The role of marital aggression. Journal of Studies on Alcohol and Drugs, 70(5), 741–750. [PubMed: 19737499]

Eisenberg N, Fabes RA, Guthrie IK, Murphy BC, Maszk P, Holmgren R, & Suh K (1996). The relations of regulation and emotionality to problem behavior in elementary school children. Development & Psychopathology, 8(1), 141–162.

Ensel WM (1982). The role of age in the relationship of gender and marital status to depression. Journal of Nervous & Mental Disease, 170(9), 536–543.

Erel O, & Burman B (1995). Interrelatedness of marital relations and parent-child relations: A meta-analytic review. Psychological Bulletin, 118(1), 108–132. [PubMed: 7644602]

Finger B, Eiden RD, Edwards EP, Leonard KE, & Kachadourian L (2010). Marital aggression and child peer competence: A comparison of three conceptual models. Personal Relationships, 17(3), 357–376. [PubMed: 24009468]

Fitzgerald HE, &Eiden RD (2007). Paternal alcoholism, family functioning, and infant mental health. Zero to Three, 11–18.

Grant JD, Waldron M, Sartor CE, Scherrer JF, Duncan AE, McCutcheon VV, … Bucholz KK (2015). Parental separation and offspring alcohol involvement: findings from offspring of alcoholic and drug dependent twin fathers. Alcoholism: Clinical and Experimental Research, 39(7), 1166–1173.

Grunbaum JA, Lowry R, & Kann L (2001). Prevalence of health-related behaviors among alternative high school students as compared with students attending regular high schools. Journal of Adolescent Health, 29(5), 337–343. doi:10.1016/S1054-139X(01)00304-4

Haltigan JD, Roisman GI, & Fraley RC (2013). The predictive significance of early caregiving experiences for symptoms of psychopathology through midadolescence: Enduring or transient effects? Development and Psychopathology, 25(1), 209–221. doi:10.1017/S0954579412000260 [PubMed: 22800694]

Ham HP, Zucker RA, & Fitzgerald HE (1993, 6). Assessing antisociality with the Antisocial Behavior Checklist: Reliability and validity studies, Chicago, IL.

Heitzeg MM, Nigg JT, Yau WYW, Zubieta JK, & Zucker RA (2008). Affective circuitry and risk for alcoholism in late adolescence: differences in frontostriatal responses between vulnerable and resilient children of alcoholic parents. Alcoholism: Clinical and Experimental Research, 32(3), 414–426.

Hingson R, White A. (2014). New research findings since the 2007 Surgeon General's Call to Action to Prevent and Reduce Underage Drinking: A review. Journal Studies of Alcohol and Drugs, 75(1), 158–169.

Hudson WW, & McIntosh SR (1981). The assessment of spouse abuse: Two quantifiable dimensions. Journal of Marriage & the Family, 43(4), 873–885.

Hussong A, Huang W, Curran P, Chassin L, & Zucker R (2010). Parent alcoholism impacts the severity and timing of children's externalizing symptoms. Journal of Abnormal Child Psychology, 38(3), 367–380. [PubMed: 20084453]

Hussong AM, Cai L, Curran PJ, Flora DB, Chassin LA, & Zucker RA (2008). Disaggregating the distal, proximal, and time-varying effects of parent alcoholism on children's internalizing symptoms. Journal of Abnormal Child Psychology, 36, 335–346. [PubMed: 17891557]

Hussong AM, Flora DB, Curran PJ, Chassin LA, & Zucker RA (2008). Defining risk heterogeneity for internalizing symptoms among children of alcoholic parents. Dev Psychopathol, 20(1), 165–193. [PubMed: 18211733]

Jaffee SR, Strait LB, & Odgers CL (2012). From correlates to causes: Can quasi-experimental studies and statistical innovations bring us closer to identifying the causes of antisocial behavior? Psychol Bull, 138(2), 272–295. doi:10.1037/a0026020 [PubMed: 22023141]

Jester JM, Nigg JT, Buu A, Puttler LI, Glass JM, Heitzeg MM, … Zucker RA (2008). Trajectories of childhood aggression and inattention/hyperactivity: Differential effects on substance abuse in adolescence. Journal of the American Academy of Child and Adolescent Psychiatry, 47(10), 1158–1165. [PubMed: 18724257]

Kendler KS, Larrson Lönn S, Salvatore J, Sundquist J, & Sundquist K (2018). The Origin of spousal eesemblance for alcohol use disorder. JAMA Psychiatry, 75(3), 280–286. [PubMed: 29417130]

Kessler RC (1995). The national comorbidity survey: Preliminary results and future directions. International Journal of Methods in Psychiatric Research, 5, 139–151.

Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, … Kendler KS (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: Results from the National Comorbidity Survey. Archives of General Psychiatry, 51(1), 8–19. [PubMed: 8279933]

Kiff CJ, Lengua LJ, &Zalewski M (2011). Nature and nurturing: Parenting in the context of child temperament. Clin Child Fam Psychol Rev, 14(3), 251–301. doi:10.1007/s10567-011-0093-4 [PubMed: 21461681]

Kimmel D, & Van Der Veen F (1974). Factors of marital adjustment in Locke's Marital Adjustment Test. Journal of Marriage and the Family, 57–63.

Kochanska G, & Aksan N (1995). Mother-child mutually positive affect, the quality of child compliance to requests and prohibitions, and maternal control as correlates of early internalization. Child Development, 66(1), 236–254.

Kochanska G, & Knaack A (2003). Effortful control as a personality characteristic of young children: Antecedents, correlates, and consequences. Journal of Personality, 71(6), 1087–1112. [PubMed: 14633059]

Kochanska G, Murray K, Jacques TY, Koenig AL, &Vandegeest KA (1996). Inhibitory control in young children and its role in emerging internalization. Child Development, 67, 490–507. [PubMed: 8625724]

Kochanska G, Murray KT, & Coy KC (1997). Inhibitory control as a contributor to conscience in childhood: From toddler to early school age. Child Development, 68(2), 263–277. [PubMed: 9180001]

Kochanska G, Murray KT, & Harlan E (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. Developmental Psychology, 36(2), 220–232. [PubMed: 10749079]

Kochanska G, Padavich DL, & Koenig AL (1996). Children's narratives about hypothetical moral dilemmas and objective measures of their conscience: Mutual relations and socialization antecedents. Child Development, 67(4), 1420–1436. [PubMed: 8890492]

Krishnakumar A, & Buehler C (2000). Interparental conflict and parenting behaviors: A meta-analytic review. Family Relations, 49(1), 25–44.

Little RJ, & Rubin DB (1989). The analysis of social science data with missing values. Sociological Methods & Research, 18(2–3), 292–326.

Locke HJ, & Wallace KL (1959). Short marital-adjustment and prediction test: Their reliability and validity. Marriage & Family Living, 21, 251–255.

Luthar SS, Cushing G, Merikangas KR, & Rounsaville BJ (1998). Multiple jeopardy: Risk and protective factors among addicted mothers' offspring. Development & Psychopathology, 10, 117–136. [PubMed: 9524811]

Luthar SS, & Zelazo LB (2003). Research on resilience: An integrative review. Resilience and vulnerability: Adaptation in the context of childhood adversities, 2, 510–549.

Masten AS (1994). Resilience in individual development: Successful adaptation despite risk and adversity: Challenges and prospects. In Educational resilience in inner city America: Challenges and prospects (pp. 3–25): Lawrence Erlbaum.

McLaughlin KA, & Sheridan MA (2016). Beyond cumulative risk: A dimensional approach to childhood adversity. Current Directions in Psychological Science, 25, 239–245. [PubMed: 27773969]

Miller AB, Sheridan MA, Hanson JL, McLaughlin KA, Bates JE, Lansford JE, Pettit GS, & Dodge KA (2018). Dimensions of deprivation and threat, psychopathology, and potential mediators: A multi-year longitudinal analysis. Journal of Abnormal Psychology, 127, 160–170. [PubMed: 29528670]

Moe J, Johnson JL, & Wade W (2007). Resilience in children of substance users: in their own words. Subst Use Misuse, 42(2–3), 381–398. [PubMed: 17558936]

Needle RH, Su SS, & Doherty WJ (1990). Divorce, remarriage, and adolescent substance use: A prospective longitudinal study. Journal of Marriage and the Family, 157–169.

O'Leary KD, & Turkewitz H (1978). Marital therapy from a behavioral perspective. In Paolino TJ Jr. & McCrady BS (Eds.), Marriage and marital therapy. New York: Brunner/Mazel.

Parke R, Cassidy J, Burks V, Carson J, & Boyum L (1992). Family contributions to peer relationships among young children. Family-peer relations: Modes of linkage, 107–134.

Pearson MR, D'Lima GM, & Kelley ML (2011). Self-regulation as a buffer of the relationship between parental alcohol misuse and alcohol-related outcomes in first-year college students. Addictive Behaviors, 36(12), 1309–1312. [PubMed: 21821365]

Raby KL, Roisman GI, Fraley RC, & Simpson JA (2015). The enduring predictive significance of early maternal sensitivity: social and academic competence through age 32 years. Child Dev, 86(3), 695–708. [PubMed: 25521785]

Radloff LS (1977). The CES-D scale: A self-report depression scale for research in the general population. Applied Psychological Measurement, 1, 385–401.

Repetti RL, Taylor SE, & Seeman TE (2002). Risky families: Family social environments and the mental and physical health of offspring. Psychological Bulletin, 128(2), 330–366. [PubMed: 11931522]

Rutter M (2012). Resilience as a dynamic concept. Dev Psychopathol, 24(2), 335–344. [PubMed: 22559117]

Straus MA (1979). Measuring intra family conflict and violence: The Conflict Tactics (CT) Scales. Journal of Marriage & the Family, 41, 75–88.

Substance Abuse and Mental Health Services Administration. (2007). Results from the 2007 National Survey on Drug Use and Health: National Findings. Retrieved from Washington, DC:

Timmermans M, van Lier PA, &Koot HM (2008). Which forms of child/adolescent externalizing behaviors account for late adolescent risky sexual behavior and substance use? J Child Psychol Psychiatry, 49(4), 386–394. [PubMed: 17979959]

Wills TA, &Dishion TJ (2004). Temperament and Adolescent Substance Use: A Transactional Analysis of Emerging Self-Control. Journal of Clinical Child and Adolescent Psychology, 33(1), 69–81. [PubMed: 15028542]

Wong MM, Nigg JT, Zucker RA, Puttler LI, Fitzgerald HE, Jester JM, … Adams K (2006). Behavioral control and resiliency in the onset of alcohol and illicit drug use: A prospective study from preschool to adolescence. Child Dev, 77(4), 1016–1033. doi:10.1111/j.1467-8624.2006.00916.x [PubMed: 16942503]

Zucker RA (1976). Parental influences on the drinking patterns of their children. Alcoholism problems in women and children, 211–238.

Zucker RA, & Noll RB (1980). The antisocial behavior checklist.

Zucker RA, Wong MM, Puttler LI, & Fitzgerald HE (2003). Resilience and vulnerability among sons of alcoholics. Resilience and Vulnerability: Adaptation in the Context of Childhood Adversities (Cambridge University Press, New York), 76–103.

Table 1

Demographics

	Non-challenged	Troubled	Resilient	Vulnerable	*F* value	Partial eta sq
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*		
Parity	1.98 (.89)	2.30 (.88)	2.03 (.91)	2.08 (.88)	.89	.02
Mother Age	31.9 (4.5)	32.4 (4.3)	30.8 (4.6)	30.5 (3.9)	1.8	.03
Mother Education	3.68 (1.4)	3.03 (1.2)	3.31 (1.4)	3.35 (1.3)	1.6	.03
Father Age	33.5 (6.1)	34.3 (7.1)	32.8 (6.0)	33.3 (5.7)	.80	.01
Father Education	3.70 (1.5)	3.73 (1.6)	2.94 (1.4)	2.98 (1.5)	**3.9** **	.06
Household Income	60,595.24 (24,243.49)	55,576.92 (20,546.38)	53,611.11 (25,318.48)	50,416.67 (23,166.52)	1.6	.03

Note. The responses for education variables were as follows: 1 = no degree, 2 = High school diploma/GED, 3 = Associate degree, 4 = Vocational degree, 5 = Bachelor's degree, 6 = Master's degree, 7 = PhD., MD, etc.

** $p < .01$.

Although there was an overall group difference in fathers' education, none of the groups were significantly different from each other, although the difference between non-challenged vs. resilient groups approached significance ($p = .052$).

Table 2

Table of Measures

Construct	Measure	Time	Method	Reliability
Child Characteristics				
Temperament	Infant Characteristics Questionnaire (ICQ; Bates et al., 1979): subscales fussy/difficult, persistent	12, 18, & 24 months	Parent report	α = .82–.84
Emotion Regulation	Behavior Rating Scale (BRS) of the Bayley Scales of Infant Development – II (BSID-II; Bayley, 1993)	24 months	Examiner Rating	α = .87
Self–regulation	Effortful Control, Internalization of rules (Eiden et al., 2016; Kochanska & Knaack, 2003)	36 months	Observations	α = 77, .79; IRR = .98
Parent Characteristics				
Parent Antisocial Behavior	Antisocial Behavior Checklist (ASB; Ham et al., 1993)	12 months	Parent report	α = .82–.90
Parent Depression	Center for Epidemiological Studies Depression Inventory (CESD; Radloff, 1977)	12, 18, 24, & 36 months	Parent report	α = .88 – .91.
Alcohol Abuse and Dependence Symptoms	University of Michigan version of the Composite International Diagnostic Interview (UM-CIDI; Anthony et al., 1994; Kessler et al., 1994)	12, 18, 24, & 36 months	Parent report	
Relationship Domain				
Partner Conflict	Conflict Tactics Scale (CTS; Straus, 1979) and Index of Spouse Abuse scale (ISA; Hudson & McIntosh, 1981)	12, 18, 24, & 36 months	Maximum of parent reports	α =.82–.91
Partner Satisfaction	Marital Adjustment Test (MAT; Locke & Wallace, 1959; O'Leary & Turkewitz, 1978)	12, 18, 24, & 36 months	Parent report	α = .72–.77
Parent Aggravation with Child	Parental Attitude toward Child Rearing (PACR; Easterbrooks & Goldberg, 1990; Easterbrooks & Goldberg, 1984)	12, 18, 24, & 36 months	Parent report	α =.75 – .78
Parent-child Interactions	Free-play & structured play (author citation blinded, details)	12, 18, & 24 months	Observations	ICC = .96–.97

Notes. IRR: Inter-rater reliability; ICC: Intra-class correlations.

Table 3

Group differences on child characteristics based on MANOVAs followed by Univariate analyses

	Non-challenged	Troubled	Resilient	Vulnerable	*F* value	Partial eta sq
ICQ:	***M (SD)***	***M (SD)***	***M (SD)***	***M (SD)***		
Fussy/Difficult	28.7 (4.8)	28.1 (4.7)	29.8 (3.8)	29.9 (4.4)	1.4	.02
Unadaptable/Reactive	**15.2 (2.7)[b]**	**16.0 (3.5)**	**16.7 (2.8)[a]**	**15.1 (2.6)[b]**	**3.1** *	**.05**
Emotion Regulation	**36.5 (6.5)[a]**	**32.9 (5.8)[b]**	**34.6 (6.4)**	**36.1 (6.9)**	**3.47** *	**.06**
Effortful Control	**.34 (.79)[a]**	**−.21 (.63)[b]**	**−.05 (.66)**	**−.002 (.72)[b]**	**4.36** **	**.07**
Internalization of rules	4.2 (.80)	4.0 (.89)	3.92 (.89)	3.88 (1.04)	.22	.03

Note.

* $p < .05$

** $p < .01$

ICQ: Infant Characteristics Questionnaire; F: Father, M: Mother. ICQ response scale is from 1 (less difficult/unadaptable) to 7 (more difficult/unadaptable); higher scores on emotion regulation, effortful control and internalization of rules indicate higher self-regulation. Results remained unchanged with child gender as covariate.

Table 4

Group differences on parent characteristics based on MANOVAs followed by Univariate analyses

	Non-challenged	Troubled	Resilient	Vulnerable	*F* value	Partial eta sq
Parent Characteristics	***M (SD)***	***M (SD)***	***M (SD)***	***M (SD)***		
Father ASB	34.9 (4.3)[a]	36.1 (6.2)[a]	40.1 (7.1)[b]	42.41 (8.7)[b]	13.18**	.18
Mother ASB	34.2 (4.7)[a]	33.9 (4.6)[a]	36.4 (6.0)	37.08 (5.2)[b]	4.31**	.07
Father CESD	6.6 (6.1)	5.9 (6.2)	6.8 (4.3)	7.3 (5.7)	.42	.01
Mother CESD	6.3 (5.5)	7.2 (5.9)	8.2 (6.3)	7.7 (5.7)	.91	.02
Father alcohol problems	**.16 (.47) [a]**	**.13 (.29) [a]**	**6.8 (10.4) [b]**	**11.6 (17.8) [c]**	**10.09****	**.15**
Mother alcohol problems	**.02 (.10) [a]**	**.18 (.63) [a]**	**.78 (2.2) [b]**	**1.9 (3.6) [c]**	**6.74****	.10

Note.

** $p < .01$

ASB: Antisocial Behavior Checklist; CESD: Center for Epidemiological Studies Depression; QFI: Quantity-Frequency of Alcohol Intake. The response range on ASB was from 1 = never - you have never done this to 4 = often - more than ten times in your life; on CESD was from 0 = rarely or none of the time (less than 1day) to 3 = most or all of the time (5–7 days). Higher scores on all measures indicated higher risk or problems. The bolded numbers reflect significant group differences between resilient and vulnerable groups. Results remained unchanged with child gender as a covariate.

Table 5

Group differences on relationship variables based on MANOVA followed by Univariate Analyses

	Non-challenged	Troubled	Resilient	Vulnerable	*F* value	Partial eta sq
Relationship Variables	***M (SD)***	***M (SD)***	***M (SD)***	***M (SD)***		
F to M CTS	**.59 (1.7)[a]**	**.75 (1.1)[a]**	**1.2 (2.6)[a]**	**2.3 (4.1)[b]**	**4.7** **	**.07**
M to F CTS	1.4 (3.4)[a]	2.3 (3.5)[c]	2.6 (4.1)[b]	4.0 (6.27)[b]	4.6 **	.07
F marital sat.	111.2 (19.5) [a]	103.9 (25)	103.5 (15.6)	97.8 (25.2) [b]	3.5 *	.06
M marital sat.	109.9 (22.9) [a]	103.6 (20.4) [a]	97.8 (26.6)	91.2 (25.6) [b]	5.9 **	.09
F aggravation	**2.6 (.46) [a]**	**2.7 (.60)**	**2.6 (.48) [a]**	**2.8 (.51) [b]**	**2.6** *	**.04**
M aggravation	2.6 (.53)	2.7 (.51)	2.8 (.52)	2.8 (.54)	.85	.01
PC Interactions						
M harshness	4.6 (.30)[a]	4.5 (.45)[a]	4.5 (.33)[b]	4.6 (.42) [b]	.67	.01
M warmth	4.2 (.53)[a]	4.2 (.52)	3.9 (.57)[b]	4.1 (.62)	2.2 +	.04
M sensitivity	4.1 (.53)	4.1 (.50)	4.0 (.42)	4.1 (.49)	.43	.01
MC dyadic rec.	3.3 (.19)[a]	3.3 (.22)	3.2 (.21)[b]	3.2 (.22)	3.0 *	.05
F harshness	4.5 (.40)	4.6 (.25)[a]	4.4 (.34)[b]	4.4 (.35)	2.3 +	.04
F warmth	4.0 (.54)[a]	4.2 (.45)[a]	3.6 (.61)[b]	3.7 (.62)[b]	7.8 **	.12
F sensitivity	4.1 (.53)	4.2 (.36) [a]	3.9 (.43) [b]	3.9 (.48) [b]	3.8 **	.06
FC dyadic rec.	3.3 (.22)[a]	3.3 (.20)[a]	3.1 (.23)[b]	3.1 (.21)[b]	8.18 **	.12

Note.

+ p < .10

* p < .05

** p < .01

One MANOVA was conducted for the parent-parent relationship variables, one for maternal parenting variables, and one for paternal parenting variables. Univariate analyses were conducted only if the overall multivariate effect was significant for these variables. CTS: Conflict Tactics Scale; PC: Parent-Child; F: Father, M: Mother; C: Child; NA: negative affect; PA: positive affect; rec: reciprocity. Higher scores on all parent-child interaction scales are positive regardless of scale label (e.g., high scores on harshness indicated low harshness; response range = 1 to 5). Response range on the MAT varied by item with ranges such as 0 = always disagree to 5 = always agree. Response range on the CTS was from 0 = this has never happened to 6 = more than 20 times in the past year (or past 6 months for follow-up assessments). Response range on the PACR was from 1 = strongly disagree to 6 = strongly agree. The bolded numbers reflect significant group differences between resilient and vulnerable groups. Results remained unchanged with child gender as a covariate.