Family Environment Variables and Adjustment Outcomes in Appalachian Youth: The Moderating Role of Participation in Extracurricular Activities

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Rebecca Lee Shorter

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ABSTRACT

Objective: Poor family functioning and parenting practices are often linked to poor adjustment outcomes for children and adolescents. We examined the association between relational and contextual family environment variables and adjustment outcomes in an understudied sample of rural Appalachian youth. Also examined was whether extracurricular involvement moderated the relationship between these variables. **Method:** Participants were 367 adolescents from multiple high schools (grades 9-12) in an Appalachian region of rural East Tennessee. Self-report measures were used to assess internalizing and externalizing problems, family relationships, extracurricular activity, and health risk behaviors; truancy data was collected from academic records. **Results:** As expected, family cohesion and moral-religiosity promoted positive outcomes for youth, while family conflict emerged as a risk-inducing factor. Significant interactions were found between both moral-religiosity and cohesion and extracurricular activity when predicting truancy, revealing extracurricular involvement as an important contributor to reductions in truant behavior. Family expressiveness was predictive of increased truancy, while extracurricular involvement appeared to strengthen this relationship. Extracurricular activity also enhanced the relationship between family conflict and substance use in this sample and negated the protective effects of family cohesion, leading to increased substance use in both instances. **Conclusions:** Findings offer preliminary support for the notion that moral-religiosity may serve a particularly important protective role for low-income rural youth. Further exploration is needed with regard to the varied impact of extracurricular involvement on outcomes in this sample.

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CHAPTER 1

INTRODUCTION

Poor parenting practices and family functioning are often linked to poor adjustment outcomes for children and adolescents. The study of these relations in low SES, rural environments is lacking, and it is possible these associations vary as a function of socio-demographic context. This study examined the association between relational and contextual family environmental variables and adolescent adjustment outcomes in a sample of rural Appalachian youth. Also examined was whether engagement in extracurricular activities moderated the association between family environment variables and adjustment outcomes.

Poverty, or low socioeconomic status (SES), – often measured by some combination of household income, and parental education, occupational or marital status – is widely acknowledged as a factor that influences child adjustment (Bradley & Corwyn, 2002; Letourneau, Duffett-Leger, Levac, Watson, & Young-Morris, 2013; Odgers et al., 2012; Teubert & Pinquart, 2010). Although the disadvantages of growing up in low SES environments are well documented, there is less agreement on the trajectory by which lower SES influences childhood mental health, with some evidence suggesting the course varies by developmental stage, context, or culture (Bradley & Corwyn, 2002; Eriksson, Cater, Andershed, & Andershed, 2011; Letourneau et al., 2013). Some argue that the association between low SES and poor outcomes begins prenatally (before birth) as a function of poor maternal health, malnutrition, and reduced access to quality education and physical and mental health care (Bradley & Corwyn, 2002; Letourneau et al., 2013). Others believe the chronic stress associated with economic hardship generates feelings of helplessness and powerlessness that adversely affect parental mental heath, which in turn affects child emotional and behavioral outcomes (Conger et al., 1991). Whereas

others meld these arguments and suggest that a combination of factors, such as access to material resources, social support, chronic environmental stress, and parental mental health, contribute to child development within the context of low SES environments (Letourneau et al., 2013). Although research on the differences between impoverished families in urban and rural communities is limited, data suggest rural families often have considerably less access to formal behavioral health services and tend to rely more heavily on primary care and other informal community-level resources (e.g., education and religion) for their mental health needs (Heflinger & Christens, 2006; Robbins et al, 2008). This lack of access to formal resources is especially pronounced for teens and may render youth in rural communities more vulnerable to emotional and behavioral problems than their urban counterparts (Heflinger & Christens, 2006; Hunt & Hopko, 2009).

The literature on low SES environments and child outcomes appears to be largely consistent with biopsychosocial (Dodge & Pettit, 2003), social-ecological (Bronfenbrenner, 1986; Heflinger & Christens, 2006), and family systems (Baird & Grant, 1998; Christie-Seely & Crouch, 1987) theories of child development, suggesting that a myriad of factors (biological, social, and psychological) in multiple spheres (i.e., individual, familial, and community) interact to affect the development and trajectory of child and adolescent outcomes in this population. Although environmental factors account for a small proportion of the variance in the development of problem behaviors (i.e., internalizing and externalizing disorders), as compared to biological and genetic factors, the family environment is largely acknowledged as one of the primary environmental influences on child behavior and outcomes (Letourneau et al., 2013; McLeod, Wood, & Weisz, 2007a; Yap, Pilkington, Ryan, & Jorm, 2014). As such, the family environment is regarded as an important context of influence on child and adolescent outcomes,

with family preventive interventions having the potential to improve outcomes across a wide array of cultural and socioeconomic backgrounds (Letourneau et al., 2013).

Family Environment and Adjustment Outcomes

As suggested by family systems theory (Baird & Grant, 1998; Christie-Seely & Crouch, 1987), child and adolescent mental health is influenced substantially by the family context and interactions among and between family members (Letourneau et al., 2013). Research overwhelmingly supports the notion that the parent-child relationship plays a critical role in the development of, vulnerability to, and protection against psychological maladjustment (Montague, Cavendish, Enders, & Dietz, 2010; Rothbaum & Weisz, 1994; Stewart & Suldo, 2011; Yap et al., 2014). The family environment, or health of the family system, is thought to play a critical role in inducing risk or promoting resiliency in youth (Baer, 2002; Reeb et al., 2015; Yap et al., 2014), with the literature pointing to several familial and parental factors as key contributors to adjustment outcomes, including but not limited to inter-parental conflict, family cohesion, and parental control (over-involvement) and rejection (hostility/aversiveness).

Family cohesion and conflict are widely acknowledged as predictors of child and adolescent adjustment and wellbeing, with low cohesion and high conflict often indicative of higher distress levels, poorer parent-child relationship quality, and increased rates of youth internalizing and externalizing problems (Barber & Buehler, 1996; Bradford, Vaughn, & Barber, 2008; Kleinman, Handal, Enos, Searight, & Ross, 1989; Lucia & Breslau, 2006). There is a vast literature in support of the connection between inter-parental/marital conflict and poor child outcomes (Bradford et al., 2008; Buehler et al., 1997; Rothbaum & Weisz, 1994; Reid & Crisafulli, 1990), with some evidence to suggest that conflict may be differentially related to internalizing and externalizing problems (Bradford et al., 2008; Teubert & Pinquart, 2010). For

instance, Bradford et al. (2008) explored the relation of overt (verbal and physical) and covert (passive-aggressive) conflict to child outcomes and found the former to be uniquely related to youth externalizing problems, whereas the latter was more strongly associated with youth depression. Inter-parental or marital conflict is typically regarded as a multifaceted construct in that it coexists with and influences parent-child conflict and a host of ineffective and/or aversive parenting strategies (Bradford et al., 2008; Buehler et al., 1997). Inter-parental conflict is thought to reduce parenting resources, or the ability to monitor a child's activities and respond adequately and appropriately to a child's needs, and has been linked to increased substance and alcohol use in youth (Bradford et al., 2008; Conger et al., 1991).

Family cohesion, generally defined as a close and connected parent-child relationship, is conversely cited as a protective factor from youth internalizing and externalizing problems, and associated health-risk behaviors, such as substance and alcohol use and risky sexual behavior (Cumsille & Epstein, 1994; Manlove, Logan, Moore, & Ikramullah, 2008; Reeb et al., 2015; Sanchez-Queija, Oliva, Parra, & Camacho, 2016). Cohesion is an aspect of the family environment that remains relatively stable throughout adolescence (Baer, 2002; Lucia & Breslau, 2006) and is thought to confer protection by way of allowing children to express their feelings in a warm, supportive environment, which may facilitate the development of more effective coping mechanisms for managing distress (Lucia & Breslau, 2006). Family cohesion is generally thought to have a direct, linear relationship with a wide range of positive outcomes in youth, with higher levels of cohesion indicative of improvements in the functioning of individual family members (Farrell & Barnes, 1993). However, there is some evidence to suggest that high levels of cohesion may foster permissive parenting strategies that allow negative or aggressive behaviors to escalate in youth as a function of lesser regulation and monitoring (Barber &

Buehler, 1996). Some have even postulated that cohesion may have a curvilinear, rather than a direct, relationship with child outcomes, viewing high levels of cohesion as deleterious and indicative of enmeshment, a form of psychological control that restricts a child's autonomy and psychosocial maturation (Baer, 2002). This curvilinear theory is largely unsupported; cohesion and enmeshment are more commonly regarded as separate constructs and have been shown to have differential effects on outcomes, with cohesion being negatively associated with internalizing and externalizing problems, and enmeshment having a strong, positive association with internalizing problems (Barber & Buehler, 1996).

Similar to cohesion, family environments that foster non-hostile and direct expression of emotion appear to buffer children from psychosocial stressors and facilitate behavioral control and recovery from distress in children and adolescents (Bronstein, Fitzgerald, Briones, Pieniadz, & D'Ari, 1993; Schroeder & Kelley, 2010). Family cohesion and expressiveness are both regarded as components of a supportive family environment, although the evidence base supports cohesion as more consistently related to positive youth outcomes. Nevertheless, research has indicated that family expressiveness may be uniquely predictive of outcomes in adolescent males (Kleinman et al., 1989), or may affect youth outcomes indirectly through improving social competence or positive self-concept (Bronstein et al., 1993).

An accumulating body of evidence suggests that positive and supportive parenting practices, characterized by warmth, sensitivity, expressiveness, adequate limit-setting, and parental monitoring, may have a positive impact on the development and maintenance of emotional and behavioral problems in youth (Odgers et al., 2012; Schroeder & Kelley, 2009; Windle et al., 2010; Yap et al., 2014). For example, a recent meta-analysis conducted by Yap et al. (2014) found that parental warmth and autonomy granting served a protective function against

internalizing problems, with autonomy granting having a particularly strong association with adolescent depression. Parental monitoring, or knowledge of children's activities, whereabouts and friends, is also known as a robust predictor of externalizing disorders (Windle et al., 2010) and has even been associated with adolescent depression (Yap et al., 2014), with high levels of parental monitoring conferring a protective benefit to youths. Contrarily, meta-analyses have revealed aversive parenting practices (rejection or hostility) – or low warmth and low acceptance-responsiveness – as a risk factor for externalizing and internalizing problems in adolescents (McLeod, Weisz, & Wood, 2007b; Rothbaum & Weisz, 1994; Yap et al., 2014). Moreover, parental over-involvement (i.e., parental control and lack of autonomy granting) and withdrawal (i.e., lack of involvement and emotional support) have also been linked to increases in internalizing problems in youth (McLeod et al., 2007a; Yap et al., 2014).

Family variables within the context of a low SES environment

Living in a low SES environment is thought to increase the use of inadequate parenting practices as a function of diminished resources, chronic stress, or increased allostatic load, and poorer parental mental health (Bradley & Corwyn, 2002; Letourneau et al., 2013). Low SES has been correlated with uninvolved, unsupportive, and aversive parenting practices, as well as poor parent-child relationship quality and reduced parent-child communication (Bradley & Corwyn, 2002; Letourneau et al., 2013). A recent meta-analysis conducted by Letourneau et al. (2013) suggested several family-level variables as mediators in the relationship between SES and child developmental outcomes, including family cohesion and support, parent-child interactions, parental discipline, and parental mental health (e.g, depression). Other studies have suggested that youth in low SES environments may be more vulnerable to familial stressors, for example, linking lower parental education and SES to an increased association between inter-parental

conflict and poor youth outcomes (Buehler et al., 1997; Teubert & Pinquart, 2010). A supportive family environment appears to be especially important for youth in low-income rural communities due to greater reliance on family members for mental health issues. A supportive family environment is thought to facilitate access to behavioral health services and promote resilience in rural youth, providing a buffer between risk and negative outcomes (Heflinger & Christens, 2006). However, family systems and processes may be undermined in low SES environments as a function of chronic stressors and economic hardship, making the family unit a promising avenue for interventions to improve child and adolescent behavioral health outcomes (Bradley & Corwyn, 2002; Heflinger & Christens, 2006; Letourneau et al., 2013), with school and primary care settings at the frontline of identification of at-risk youth in rural communities (Heflinger & Christens, 2006).

However, not all evidence supports the notion that lower SES reduces family functioning. For example, McLeod et al (2007b) found a stronger association between aversive parenting practices (rejection and hostility; or low warmth and low acceptance-responsiveness) and depression in children from higher SES backgrounds. The authors concluded that the abundance of stressors in low SES environments may render child adjustment outcomes less dependent upon parenting practices than other environmental or contextual factors. Other studies have suggested that family relationships should be understood within contexts, emphasizing varied interaction patterns and forms of reciprocity that may occur within families of higher and lower SES backgrounds. For example, Chen and Berdan (2006) found lower SES families to exhibit stronger reciprocity or responsiveness to withdrawn behaviors, as compared to higher SES families, and this reciprocity was associated with improved family outcomes (i.e., high cohesion, low conflict). Withdrawn behaviors may be more prevalent in low SES families and may serve a

unique function within this context, allowing individual family members to openly experience low positive emotion and cope with a variety of environmental stressors.

Research also supports the relative importance of various contextual factors within family environments, such as moral-religiosity, with some evidence to suggest that religiosity may serve a protective function during childhood and adolescence and confer benefits in emotional and behavioral functioning (Bradford et al., 2008; Eriksson et al., 2011; Hunt & Hopko, 2009). Multiple studies have linked increased religiosity with fewer antisocial or problem behaviors, including reduced alcohol and substance use and risky sexual behavior (Bradford et al., 2008; Manlove et al., 2008; Regnerus, 2003; Yonker, Schnabelrauch, & DeHaan, 2012). While there has been some debate in the literature regarding the benefits of religiosity and its tendency to be understudied, the majority of research in this area suggests that religiosity may promote positive development and identity formation (Bradford et al., 2008; Regnerus, 2003; Yonker et al., 2012). A recent meta-analysis conducted by Yonker et al. (2012) found spirituality and religiosity to impart benefits to adolescents and young adults, in terms of risky behaviors, mood and overall well-being, with greater reductions in risky behaviors observed among Caucasian and older (emerging adult) individuals. Given that rural families may rely more heavily on family and community-level supports, including religious and educational outlets, for their mental health needs (Heflinger & Christens, 2006; Robbins et al, 2008), family religiosity may serve a particularly important function to rural youths.

Extracurricular Involvement as Protection against Poor Outcomes

Adolescence is widely recognized as a developmental stage encompassing a transition from relative dependency to increased autonomy and independence, marked by an increase in the incidence of anxiety and depression, particularly among girls, and disruptive and antisocial

behavior, particularly among boys (Teubert & Pinquart, 2010; Yap et al., 2014). Extracurricular involvement is thought to help youth navigate the core developmental tasks of adolescence, including autonomy and identity formation (Denault & Poulin, 2009). Extracurricular involvement is known to promote a variety of positive youth outcomes, including reductions in problem behaviors and truancy and improvements in academic performance and overall psychosocial adjustment and wellbeing (Denault & Poulin, 2009; Eisman, Stoddard, Bauermeister, Caldwell, & Zimmerman, 2016; Vandell, Larson, Mahoney, & Watts, 2015). These benefits are thought to sustain in both the short- and long-term, with participation in extracurricular activities predicting lower high school dropout rates and an increased likelihood of attending college and enjoying more favorable mental health outcomes in young adulthood (Eisman et al., 2016; Fredricks & Eccles, 2006).

However, some studies have suggested the potential for negative outcomes, namely increased substance and alcohol use, as a product of participation in certain extracurricular activities (Denault & Poulin, 2009; Eisman et al., 2016; Fredricks & Eccles, 2006). Some studies suggest that sports participation, in particular, may lead to increased rather than decreased substance use, possibly as a result of interactions with deviant or antisocial peers (Eccles & Barber, 1999; Eisman et al., 2016; Fredricks & Eccles, 2006). Similarly, the literature on extracurricular involvement and sexual behavior suggests that sports participation may spur increases in risky sexual behavior, specifically among male athletes (Feldman & Matjasko, 2005). For example, Miller, Sabo, Farrell, Barnes, and Melnick (1999) found that male athletes had more sexual partners and encounters but were more likely to use contraception than were male non-athletes. On the other hand, sports participation provided a protective effect for female

athletes, in terms of contraceptive use, sexual initiation, and number of partners, as compared to female non-athletes.

Despite the potential for negative effects, research indicates that extracurricular involvement is increasingly likely to serve a compensatory function for low-income and at-risk youth, offsetting the risks associated with living in a socioeconomically disadvantaged community and promoting positive developmental outcomes (Eisman et al., 2016; Mahoney & Eccles, 2008; Vandell et al., 2015). However, in spite of the potential to derive increased benefits from participation, lower SES youth are generally less likely to participate in organized activities due to limited access and availability and reduced family resources (Denault & Poulin, 2009; Eisman et al., 2016; Mahoney & Eccles, 2008). There is concern that low-income youth may have fewer opportunities to build developmental competencies as a result of reduced access to organized activities (Mahoney & Eccles, 2008). In addition, low-income youth may be exposed to more unstructured or unsupervised after-school activities, which are thought to increase risk by providing youths with more opportunities to engage in problem behaviors and problematic peer relationships (Fredricks & Eccles, 2006; Mahoney & Eccles, 2008). As a result of reduced family resources, children from lower SES families may also experience increased demands on their time and barriers to participation, such as pressure to work outside the home to supplement family income or to care for younger siblings during after-school hours (Mahoney & Eccles, 2008; Vandell et al., 2015), which may limit the compensatory effects of participation on outcomes.

Consistent with Bronfenbrenner's (1986) social-ecological theory, the family system is likely to interact with external systems, such as peer groups, school, and organized activities, comprising a *mesosystem,* defined as two or more systems in interaction with one another. In

particular, the intersection of the family system and organized activity has been identified as an important and relatively understudied mesosystem (Vandell et al., 2015). Given that both family environment and extracurricular involvement are independently predictive of adjustment outcomes in youth (Letourneau et al., 2013; Vandell et al., 2015; Yap et al., 2014), the interaction between these systems presents a promising area of research. There is a paucity of research examining interactions between these systems in general, with most research aiming to identify family characteristics that predict involvement in extracurricular activities (Vandell et al., 2015). There appears to be a call for investigation into the potential interactive effects of family and extracurricular activities (Mahoney & Eccles, 2008; Vandell et al., 2015) and this study marks a step in this direction by aiming to identify whether extracurricular involvement moderates the relationship between family environment and adjustment outcomes in a sample of rural youth.

Present Study

The current study examined the degree to which family environment variables predict adjustment outcomes in a sample of rural (Appalachian) youth. Specifically explored were relational (i.e., conflict, cohesion, expressiveness) and contextual factors (i.e., moral-religiosity) in the family environment and their respective associations with youth outcomes. Little is known about predictors of adjustment outcomes in this population, with some studies suggesting that family environment variables may be of greater or lesser importance within the context of a low SES environment (McLeod et al, 2007b; Letourneau et al., 2013; Teubert & Pinquart, 2010). The current study set out to explore the relative importance of family environment variables for adolescents living in a rural, low-income area in Appalachia.

As mentioned above, this study also examined the potential moderating effect of extracurricular involvement within this sample, given that little is known about the interaction of family environment variables and participation in extracurricular activities in rural youth. It is quite possible that family and organized activities have a unique interaction in this population, as a function of low SES and associated cultural factors and environmental stressors. Given the data in support of the protective function of family cohesion and moral-religiosity, it was hypothesized that increased family cohesion and religiosity would be associated with improved youth outcomes, and that extracurricular involvement would facilitate positive outcomes. Given lesser evidence in support of family expressiveness as a protective factor, no specific hypotheses were generated with respect to this variable, with the expectation that expressiveness would be less predictive of outcomes, as compared to family cohesion and moral-religiosity. Family conflict, on the other hand, was hypothesized as a risk-inducing factor for negative outcomes, and extracurricular involvement was postulated to buffer or attenuate these effects.

CHAPTER 2

METHODS

Participants

Participants were 367 adolescents (females: *n* = 214; males: *n* = 153) in grades 9-12, recruited from four different high schools in an Appalachian region (geographically and culturally) of a rural southern state (Hunt & Hopko, 2009). The sample was 94% Caucasian with a mean age of 15.9 years (*SD* = 1.4) and a mean grade-level of 10.2 years (SD = 1.2). Participants were 58.3% female and 41.7% male, with the majority of children (53.4%) living at home with both parents (*n* = 196). The average level of parental education was 12 or less years, with 65% of mothers and 76% of fathers reported as having a high school education or less. Recruitment and survey administration were conducted in high school English classes to obtain a representative sample, given that English was a required course and block scheduling ensured that half of the student body at any given time was enrolled in English courses. All English courses were included for recruitment purposes, with the exception of courses fulfilling special education requirements.

Measures

Participants completed multiple self-report measures to assess internalizing and externalizing problems, family relationships, extracurricular involvement, and health risk behaviors. Data on grade point average and truancy (i.e., total number of unexcused absences) were collected from academic records provided by school office personnel as per established guidelines (Zimmerman, Caldwell, & Bernat, 2002). For the purposes of the current study, truancy was defined as the total number of unexcused absences (full day) for the 2004-2005 academic school year.

Internalizing and Externalizing Problems

The *Youth Self-Report* (YSR; Achenbach & Rescorla, 2001) is an extension of the *Child Behavior Checklist (CBCL)* designed to assess emotional and behavioral functioning within the last 6 months for children and adolescents who are 11-18 years old. The questionnaire contains 112 items that are rated on a 3-point scale (0 = Not true to 3 = Very true). The YSR is a widely used standardized measure that yields two primary broadband factors, Internalizing (Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints) and Externalizing (Rule-Breaking and Aggressive Behavior) problems. For the current study, the syndrome scales (Anxious/Depressed, Somatic complaints, Withdrawn/Depressed, Social Problems, Thought Problems, Attention Problems, Rule-Breaking, and Aggressive Behavior) were computed, but only the broadband factors were used in the final analyses.

Consistent with initial psychometric data on this measure (Achenbach & Rescorla, 2001), three of the eight narrow-band symptom patterns loaded most significantly on the Internalizing factor for this sample: Anxious/Depressed (.88), Withdrawn/Depressed (.84), and Somatic Complaints (.63). The Aggressive Behavior and Rule-Breaking Behavior narrow-band factors had loadings of .83 and .88, respectively, on the Externalizing broadband factor. The Social Problems, Thought Problems, and Attention Problems scales loaded moderately on both broadband factors, consistent with literature examining the psychometric properties of this measure (Achenbach & Rescorla, 2001). For the current study, internal consistency ranged from 0.71 to 0.95 across subscales. There is extensive evidence of the YSR's test-retest reliability, criterion validity, and convergent validity (Achenbach, 1991; Achenbach & Edelbrock, 1986), and the literature suggests that all YSR scales adequately discriminate between clinical and non-

clinical samples, correlating significantly with DSM-IV clinical diagnoses (Achenbach & Rescorla, 2001).

Family Environment Variables

The *Family Environment Scale-Real Form* (FES-Form R; Moos & Moos, 2002) is self-report measure comprised of 90 items (true/false) designed to assess perceptions of family environment across three broad dimensions: family relationships, personal growth dimensions, and family system maintenance. The FES scale has good psychometric properties and is comprised of of 10 subscales: Cohesion, Expressiveness, Conflict, Independence, Achievement, Intellectual-Cultural, Active-Recreational, Moral-Religious, Organization and Control (Moos & Moos, 2002). Three subscales (Cohesion, Expressiveness, and Conflict) reflect relationship dimensions within the family. Five subscales assess personal growth within the family (Independence, Achievement Orientation, Intellectual-Cultural Orientation, Active-Recreational Orientation, and Moral-Religious Emphasis), and two subscales (Organization and Control) measure family system maintenance dimensions within the family (e.g., the relative importance of organization, structure, and rules within the family unit).

Four family environment subscales were used in this study: The Moral-Religiosity subscale of the personal growth dimension and three subscales (i.e., Cohesion, Expressiveness, and Conflict) comprising the family relationship dimension. This selection is consistent with literature suggesting that three of the four selected subscales, namely Cohesion, Conflict, and Moral-Religiosity, are reliable for use with an adolescent sample, with all other FES subscales estimated to have low to moderate reliability with this population (Boyd, Gullone, Needleman, & Burt, 1997). The Cohesion subscale assesses “the degree of commitment, help, and support” provided by family members for one another (Moos & Moos, 2002). The Expressiveness

subscale measures the degree to which family members are encouraged to express their feelings directly. The Conflict subscale measures the degree to which family members openly express feelings of anger or hostility, specifically. The Moral-Religiosity subscale assesses the relative emphasis on ethical/moral and religious issues and values within the family.

Internal consistency across FES subscales typically ranges from .61 to .78 (Mancini & Sporakowski, 2001). Test-retest reliability across subscales has been found to range from .68 to .86 at 2-months, and .54 to .86 at 4-months (Mancini & Sporakowski, 2001). No difference in perception of family environment has been found among depressed and non-depressed members of the same family (Moos & Moos, 2002). Scores have been found to vary as a function of family demographics and composition, such that individuals from single-parent families tend to endorse more expressiveness, conflict, independence, and behavioral problems, relative to those from two-parent families (Featherstone et al., 1993; Matherne & Thomas, 2001; Miller & Plant, 1999; Moos & Moos, 2002; Thomas et al., 1994). Similarly, individuals from large families and families of youth with behavioral and emotional problems have been found to report lower cohesion, expressiveness, independence, organization, and control, as well as increased conflict (Jacobson & Crockett, 2000; Lucia & Breslau, 2006; Matherne & Thomas, 2001; Moos & Moos, 2002; Roche, Ahmed, & Blum, 2008).

Health Risk Behaviors

Alcohol and Substance Use

Self-report data on alcohol and substance use was collected via the *Perceived Benefit of Drinking Scale* and the *Perceived Benefit of Drug Use Scale,* both of which are five-item scales developed to provide information on the function of adolescents alcohol and substance use behaviors. Research suggests an internal consistency of .69 and .82 for these scales, respectively,

as well as adequate discriminate validity (Petchers, Singer, Angelotta, & Chow, 1988). For the current study, the Perceived Benefit Scales were included as part of a modification of the St. Vincent Charity Hospital and Health Center Adolescent Unit Youth Questionnaire, a 36-item self-report questionnaire developed for use with an adolescent inpatient population. Questionnaire items assess the frequency of use, intoxication levels, as well as circumstances and problems associated with substance use (Bean, 1992). Items that were redundant or that overlapped considerably were eliminated from the St. Vincent Charity Hospital and Health Center Adolescent Unit Youth Questionnaire, and minor changes were made to items pertaining to alcohol use in an effort to reflect modern youth culture. For example, the phrase "to feel high" was removed from a question assessing frequency of alcohol use, initially worded as follows: "During the last two months, about how many times did you drink just enough to feel high or light-headed?" All items from the Perceived Benefit scales remained unaltered. In the current study, good internal reliability was established for both the Perceived Benefit of Drinking scale (α= .77) and the Perceived Benefit of Drug Use scale (α= .85).

For the current study, three items from the St. Vincent Charity Hospital and Health Center Adolescent Unit Youth Questionnaire scale were used to create aggregate variables representing alcohol use and substance use, respectively. Items that assessed overall frequency of alcohol/substance use and average level of intoxication within the past two months were summed to form an aggregate variable, with higher scores reflecting greater overall use of alcohol/substances. For example, the following three items were used to form the aggregate variable for alcohol use, with near-identical items being used to create the aggregate variable for substance use: 1. "*How often do you usually drink?*" (responses: a) I don't drink at all, b) Once a month or less, c) Two or three times a month, d) One or two times a week, e) Three or more

times a week); 2. "*During the last two months, about how many times did you drink to feel light-headed?*" (responses: a) None, b) 1-2 times, c) 3-5 times, d) 6-8 times, e) 9 times or more); and 3. "*During the last two months, about how many times did you drink to get drunk?*" (responses: a) None, b) 1 time, c) 2 times, d) 3 times, e) 4 times, f) 5 times, g) 6 times, h) 7 times or more). The internal consistencies of the aggregate variables for substance and alcohol use were .74 and .76, respectively. Aggregate scores across items were used in all analyses involving alcohol use or substance use as outcomes.

Risky Sexual Behavior

The *Sexual Behaviors Questionnaire* is an eight-item questionnaire that was developed for this study to assess risky sexual behavior. Because brief, age-appropriate questionnaires on youth sexual activity were not readily available, a face-valid questionnaire was developed specifically for use in this study (Hunt & Hopko, 2009). For the present study, five select items (4 multiple-choice items; 1 open textbox item) from this questionnaire were used to create an aggregate variable representing risky sexual behavior. Items that assessed frequency of and risk level associated with sexual behavior (e.g., condom use, number of sexual partners, and sexual encounters while using alcohol or drugs) were recoded and summed to form an aggregate variable, with higher values representing higher levels of risky sexual behavior. The internal consistency of the aggregate variable was .59. This aggregate variable was used in all analyses involving risky sexual behavior as an outcome, as opposed to analysis at the item level.

Extracurricular activities and Demographics

A demographics form was administered to all students and consisted of items assessing age, gender, grade level, ethnicity, involvement in extracurricular and leadership activities, parents' education and marital status, and participation in organized religion. A dichotomous

(Yes/No) item on the demographics form assessed involvement in a wide range of extracurricular activities, including sports, cheerleading, dance team, pep squad, band, orchestra, and/or choir.

Procedures

This project was approved by the University Institutional Review Board, and written parental consent and child assent were obtained for all participating children. Informed consent documents were given to students in all eligible English classes (grades 9-12) at participating high schools. Consent forms were sent home for parents to review and sign to provide consent for their child's participation. A total of 914 consent forms were sent home and 367 (40.2%) were returned. All students with parental consent were provided with a description of the study and were asked to sign an informed assent document. If parental consent and child assent were obtained, students were asked to complete a demographics form and a packet of self-report measures (approximately 60 minutes in length). Participating students remained in the classroom while completing self-report measures and were overseen by trained undergraduate and/or graduate research assistants. Non-participating students were given other tasks to perform by their respective English teachers.

Statistical Analyses

Descriptive statistics and correlations among primary study variables were computed using Mplus 7.2. Regression analysis was conducted in Mplus 7.2 using maximum likelihood estimation with a Monte Carlo integration algorithm to examine the relations between family relationship variables and adjustment outcomes. Interaction terms between family environment variables and extracurricular activities were computed and included in the analysis to examine the extent to which the relation between family environment variables and adjustment was

conditioned on engagement in extracurricular activities. All predictor (family environment) variables were mean-centered to reduce multicollinearity (Aiken & West, 1991). Age, gender (dummy code 1 = male), and ethnicity (dummy code 1 = white) were included as control variables in primary analyses. Truancy was treated as a count variable for primary analyses (i.e., rounded down to nearest whole number of unexcused absences) and a Poisson Regression was estimated using maximum likelihood estimation for this outcome variable. Estimates corresponding to the regression of truancy on predictor variables reflect the log of the expected count. For ease of interpretation, these estimates were converted to incidence rate ratios (IRR) by exponentiating the log of the expected count. Missing data was captured using full information maximum-likelihood estimation and ranged from 0.3% to 4.9% across variables.

CHAPTER 3

RESULTS

Preliminary Analyses

Mean scores for predictor and outcome variables are presented in Table 1. Correlations among primary study variables are presented in Table 2. Family cohesion was positively correlated with family expressiveness, $r = .44$, $p \leq .01$, and moral-religiosity, $r = .42$, $p \leq .01$, and family expressiveness was positively correlated with moral-religiosity, $r = .15$, $p \leq .01$. Family conflict was negatively associated with family cohesion, $r = -.66$, $p \leq .01$, expressiveness, $r = -.28$, $p \leq .01$, and moral-religiosity, $r = -.37$, $p \leq .01$. Family cohesion ($r = -.14$ to $-.39$, $p \leq .01$) and moral-religiosity ($r = -.11$ to $-.37$, $p \leq .01$) were negatively associated with all outcomes, with the exception of truancy. Family expressiveness was not significantly correlated with the majority of measured outcomes, although expressiveness was found to be negatively associated with internalizing problems, $r = -.15$, $p \leq .01$. Family conflict was positively associated with all adjustment outcomes, with the exception of truancy (non-significant), with correlations ranging from .23 to .56 ($p \leq .01$). Positive correlations were found among all outcome variables ($r = .11$ to .68, $p \leq .05$), with the exception of truancy and internalizing problems ($r = .10$, $p = .09$). Positive correlations were found between extracurricular involvement and all family environment variables (cohesion: $r = .15$, $p < .05$; expressiveness: $r = .17$, $p \leq .01$; and moral-religiosity, $r = .19$, $p \leq .01$), with the exception of family conflict ($r = -.04$, $p = .60$). A negative correlation was found between extracurricular involvement and internalizing problems, $r = -.16$, $p < .05$.

Primary Analyses

Results from the regression model are presented in Table 3. As a set, model predictors explained 22.6%, 17.3%, 13.5%, 25.2%, and 38.5% of the variance in risky sexual behavior, alcohol use, drug use, and internalizing and externalizing problems, respectively. Age emerged as a significant predictor of truant and externalizing behaviors; younger children were scored higher on self-reported externalizing behaviors and lower on truancy. Gender emerged as a significant predictor of health risk behaviors, with females displaying less risky sexual behavior and less alcohol and substance use than their male peers. Of the health risk behaviors measured, age was found to be positively associated with risky sexual behavior in particular. Gender was also differentially associated with internalizing and externalizing disorders, with girls displaying higher levels of internalizing behaviors and lower levels of externalizing disorders than boys. Involvement in extracurricular activities was found to be associated with fewer self-reported externalizing problems.

Among the family environment variables examined, moral-religiosity was found to be a negative predictor of risky sexual behavior (β = -.208, p < .01), internalizing (β = -.147, p < .05) and externalizing (β = -.176, p < .01) problems, and alcohol (β = -.144, p = .06) and substance (β = -.147, p = .07) use, although this trend was non-significant for the latter two variables. Family conflict, on the other hand, was found to be a positive predictor of several outcomes, including alcohol use (β = .282, p < .01), and internalizing (β = .222, p < .01), and externalizing (β = .513, p < .01) problems, representing a potential risk factor. No direct relationship was found between family conflict and drug use (β = .100, p = .30), although participation in extracurricular activities was found to moderate the relationship between these variables (see Interaction effects). Family cohesion was found to be negatively associated with internalizing problems (β =

-.223, $p = .01$), with children from more cohesive families displaying fewer overall internalizing issues (e.g., anxiety/depression). Lastly, family expressiveness was found to be a positive predictor of truancy ($OR = .1.02$, $p < .01$); for every one-unit increase in family expressiveness there was a 2% increase in children's rate of truancy.

Interaction effects

Several significant interactions were found between family environment variables and extracurricular activities when predicting drug use and truant behaviors. An online interaction utility (Preacher, Curran, & Bauer, 2006) was used to examine the simple slopes of family environment variables on outcomes at conditional values (0 and 1; dichotomous) of extracurricular involvement. A significant interaction was found between family conflict and extracurricular activity when predicting drug use, $\beta = .074$, $p < .05$. Family conflict was a significant positive predictor of drug use, $\beta = .098$, $t = 3.17$, $p = .002$, for adolescents involved in extracurricular activity, and was not significantly related to drug use for adolescents with no extracurricular involvement, $\beta = .024$, $t = 1.04$, $p = .30$. The interaction between drug use and family conflict is displayed graphically in Figure 1.

A significant interaction was also found between family cohesion and extracurricular involvement when predicting truancy, $IRR = .97$, $p < .01$, and drug use, $\beta = .071$, $p = .01$. Examination of the simple slopes for the regression of truancy on family cohesion at conditional values of extracurricular activity revealed family cohesion to be a negative predictor of truant behavior when involved in extracurricular activity (value = 1), $IRR = 1.03$, $t = 9.48$, $p < .01$ such that for every one unit increase in family cohesion, the rate of truancy decreased by 3% for children engaged in extracurricular activities. The simple slope for the association between family cohesion and truancy was non-significant for children endorsing no extracurricular

activity, *IRR* = 1.001, $t = .318$, $p = .75$ (see Figure 2). Upon examining simple slopes of family cohesion on drug use, family cohesion was found to be marginally associated with drug use, such that children from cohesive families were more likely to exhibit increased drug use when involved in extracurricular activities, $\beta = .042$, $t = 1.93$, $p = .06$. The association between family cohesion and drug use was non-significant and in the opposite direction when extracurricular involvement was zero, $\beta = .029$, $t = 1.51$, $p = .13$ (see Figure 3).

The interaction between family moral-religiosity and extracurricular activity was significantly associated with the rate of truancy, *IRR* = .98, $p < .01$. Moral-religiosity was found to be a negative predictor of truant behavior when involved in extracurricular activities, *IRR* = 1.025, $t = 7.20$, $p < .01$, such that there was a 2.5% decrease in truancy for every one unit increase in moral-religiosity. The relationship between moral-religiosity in the family and truancy was non-significant when extracurricular involvement was zero, *IRR* = 1.004, $t = .992$, $p = .32$ (Figure 4). Lastly, there was a non-significant trend for the interaction between family expressiveness and extracurricular involvement when predicting truancy, *IRR* = 1.010, $p = .07$, such that for every one unit increase in family expressiveness there was a 2.8% increase in the rate of truancy when involved in extracurricular activities, *IRR* = 1.028, $t = 3.13$, $p < .01$ (see Figure 5).

CHAPTER 4

DISCUSSION

The family environment is known to play a critical role in inducing risk and promoting resiliency in youth (Baer, 2002; Reeb et al., 2015; Yap et al., 2014) and is commonly regarded as one of the predominant environmental influences on child and adolescent outcomes (Letourneau et al., 2013; McLeod et al., 2007a). The family environment may be compromised in low SES environments as a function of chronic environmental stress, marking family preventive interventions as a promising strategy for improving outcomes in this population (Bradley & Corwyn, 2002; Heflinger & Christens, 2006; Letourneau et al., 2013). The current study sought to identify the relative effect of family environment variables in an understudied population of rural (Appalachian) youth, as well as the potential moderating role of extracurricular involvement in this sample. Based on research documenting the generally protective role of family cohesion and moral-religiosity (Manlove et al., 2008; Lucia & Breslau, 2006; Yonker et al., 2012), it was reasoned that greater cohesion and religiosity would be associated with improved youth outcomes, and that these family variables would interact in a positive, complementary fashion with extracurricular involvement. Given the wealth of research documenting family conflict as a risk-inducing factor (Bradford et al., 2008; Lucia & Breslau, 2006), it was predicted that higher levels of family conflict would yield poorer youth outcomes and that extracurricular involvement would function as a buffer and attenuate the effects of conflict on outcomes.

Main versus Moderator Effects

Results from primary analyses generally supported our hypotheses, whereas interaction effects were somewhat less consistent, suggesting that extracurricular involvement may not

necessarily serve a compensatory role in this population. Consistent with hypotheses, we found family cohesion and moral-religiosity to generally promote positive outcomes for youth. This result is consistent with the wealth of literature citing family cohesion and moral-religiosity as protective factors facilitating resiliency in youth (Eriksson et al., 2011; Lucia & Breslau, 2006; Yonker et al., 2012).

Interestingly, the results suggest that family moral-religiosity may be an especially important protective factor in this population. Moral-religiosity was predictive of improved outcomes to a greater extent than was family cohesion in this sample, conferring benefits to youths across a wider range of adjustment outcomes, including reduced risky sexual behavior and internalizing and externalizing problems, and lesser substance and alcohol use (non-significant trend in the expected direction). By comparison, family cohesion was less predictive of outcomes, correlating negatively with internalizing problems, but not emerging as a significant predictor of other adjustment outcomes (i.e., externalizing problems, truancy, or health-risk behaviors). This finding suggests that a cohesive family environment may confer a protective benefit, specifically in terms of reducing risk for anxiety and depression, whereas moral-religiosity may provide a wider range of benefits to rural, low-income youth. The heightened importance of moral-religiosity in this sample may stem from the tendency for individuals in rural communities to rely more heavily on religion for their mental health needs, due in part to lesser resources and access to formal care (Heflinger & Christens, 2006; Robbins et al, 2008).

Significant interactions were found between both moral-religiosity and cohesion and extracurricular activity when predicting truancy, revealing extracurricular activity as an important contributor to reductions in truant behavior in this population. Although the direct

effect of moral-religiosity on truant behavior was not significant, extracurricular involvement was found to strengthen this relationship, such that youth from moral-religious families were less likely to engage in truant behavior when involved in extracurricular activities. This finding suggests that extracurricular involvement may provide morally religious youth with increased incentive to attend school, which is consistent with literature suggesting that extracurricular involvement is related to improvements in school attendance and performance (Hunt & Hopko, 2009; Vandell et al., 2015). Extracurricular involvement bolstered the relationship between family cohesion and truancy in a similar fashion, in that children from cohesive families engaged in less truant behaviors when participating in extracurricular activities, providing further evidence in support of extracurricular involvement as an important component in reducing truancy in rural, low-income environments.

Interestingly, family expressiveness was found to be predictive of an increase in truant behaviors, suggesting that expressiveness may confer more risk than benefit in this population. This finding is somewhat inconsistent with the literature characterizing expressiveness as a component of a supportive family environment that promotes positive outcomes; however, one possible explanation for this finding lies in parental emotion socialization, or parent's approaches to their child's emotions. Children from more expressive families may be more vocal about negative emotions, including the desire to stay home from school for emotional, physical, or other reasons, such as avoiding unpleasant interactions (peer or otherwise). Research suggests that parents in low-SES families may be more likely to engage in maladaptive approaches to their children's emotions, in that they are less likely to attend to their children's emotions as teaching moments (i.e., emotion coaching). Instead, parents in low-SES families appear to be more likely to engage in emotion-dismissing behaviors, such as avoiding or protecting children

from negative emotions (Lunkenheimer, Shields, & Cortina, 2007), which may further promote avoidance behaviors. Furthermore, our results suggest that the relationship between expressiveness and truancy may be strengthened by participation in extracurricular activity, with evidence for a marginal interaction in which extracurricular involvement accentuated the positive relation between these two variables.

Consistent with the existing literature, family conflict was a risk factor in this population and was generally predictive of poorer adjustment outcomes, including increased levels of internalizing and externalizing problems and alcohol use. While no direct relationship was found between family conflict and drug use, extracurricular involvement had a moderating effect on the relationship between these variables, such that the risk-inducing effects of family conflict were *enhanced* by participation in extracurricular activities. When enrolled in extracurricular activities, children from families with higher conflict tended to engage in more substance use. A similar and somewhat surprising, albeit marginal, interaction was found between family cohesion and extracurricular involvement when predicting drug use. Extracurricular involvement was found to negate the generally protective quality of family cohesion and reversed the relationship, providing a risk-inducing effect, with participation in extracurricular activities leading to greater substance use in youth from cohesive families.

These moderating effects were inconsistent with our hypotheses; rather than providing a buffering effect, extracurricular involvement appears to enhance risk for rural, low-income youth under some circumstances. One possible explanation for this finding is that extracurricular activities may be less structured and/or less supervised in rural low-income communities, providing more opportunities for youth to engage in substance use and other problematic behaviors and peer relations (Fredricks & Eccles, 2006; Mahoney & Eccles, 2008). Youth from

families with high levels of conflict may be especially susceptible to this effect, given the known and detected relationship between family conflict and poorer outcomes. Another potential explanation is that youth from lower SES families may experience added burden when participating in extracurricular activities, in that they may need to balance competing family demands with participation, potentially working to supplement family income or providing childcare for younger siblings (Mahoney & Eccles, 2008; Vandell et al., 2015). These increased demands may increase stress and susceptibility to negative outcomes and problematic behaviors, especially in unstructured and/or unsupervised extracurricular contexts. The marginal risk-inducing effect of extracurricular involvement on youth from cohesive families may stem from lesser parental monitoring, with some research suggesting that higher levels of cohesion may be related to more permissive parenting strategies (Barber & Buehler, 1996). It is possible that youth from more cohesive families may be granted the opportunity to engage more freely in substance use and other problematic behaviors with lesser parental regulation when enrolled in extracurricular activities, particularly if those activities are largely unsupervised or unstructured.

Limitations and Future Directions

Our study has several limitations worth noting. The cross-sectional nature of the study does not allow for causal inferences about the effect of family functioning on adolescent outcomes; nor do our findings reveal specific mechanisms through which extracurricular involvement might attenuate or accentuate risk. However, our findings allow for tentative conclusions to be drawn about the relation between these variables in an understudied population of rural Appalachian youth. Future longitudinal research would allow for the exploration of causal effects, including the degree to which specific outcomes develop in response to various aspects of family functioning. Another limitation of the current study stems from its reliance on

self-report data, limiting our ability to determine the extent to which our findings generalize beyond a single report source. Including data from multiple informants on family functioning and adjustment outcomes would broaden the scope of the current findings and possibly reveal unique relationships or inconsistencies not otherwise detected through adolescent self-report data. Measures on parenting style and parental mental health may also enrich the current findings and reveal relationships and subtleties not detectable through the current design.

Furthermore, this study used a dichotomous variable to measure extracurricular involvement that included a wide variety of activities (i.e., sports, cheerleading, dance team, pep squad, band, orchestra, and/or choir) and was therefore unable to detect more nuanced relationships between activity type or intensity and outcomes. Given that previous research has detected differences in outcomes based on activity type, with sports participation being linked to poorer outcomes in some instances (Eccles & Barber, 1999; Eisman et al., 2016; Fredricks & Eccles, 2006), activity type may be an especially important factor to consider when accounting for the moderating effect of extracurricular involvement on youth outcomes. There is an accumulating body of evidence linking breadth (number of activities), intensity (frequency) and duration of involvement, as well as investment and the overall quality of the extracurricular experience to adjustment outcomes (Eisman et al., 2016; Vandell et al., 2015). Future research may benefit from capturing more data with respect to extracurricular involvement in rural youth, with a longitudinal design being particularly well suited to this task. There is also some research to suggest that family environment variables and extracurricular involvement may produce differential effects by gender (Bradford et al, 2008; Feldman & Matjasko, 2005; Sanchez-Queija et al., 2016), which may be an important area for exploration in future studies.

Additionally, data on adolescent employment status was not captured in the current study, which may be an especially important variable to examine in an Appalachian sample. Data on youth employment status may be particularly revealing in this population, as low-income youth may be more likely to work outside the home to supplement family income (Mahoney & Eccles, 2008; Vandell et al., 2015), which may in turn limit the compensatory effects of extracurricular involvement and increase stress and burden on the adolescent. The inclusion of employment information in future studies may further our understanding of the complex and occasionally risk-promoting effects of extracurricular involvement in this sample, particularly with regard to substance use behavior. Adolescents under greater stress may be more likely to engage in substance use as a form of stress reduction, especially when surrounded by like-minded peers (Feldman & Matjasko, 2005; Sanchez-Queija et al., 2016).

Conclusion

Despite these limitations, the current study has several strengths, including its large sample size and use of an underrepresented sample of rural Appalachian youth. Although the study design was cross-sectional, the findings indicate that family environment variables may be uniquely related to youth outcomes in this population, with moral-religiosity appearing to serve a particularly important role in protecting low-income youth from negative outcomes. Our findings require replication before firm conclusions can be drawn; however, if replicated, the results are encouraging for those seeking ways to promote positive youth outcomes via family preventive interventions, suggesting that fostering increased moral-religiosity and cohesion in families may be an effective way to do so in low-income rural environments.

Our findings also highlight the unique ways in which extracurricular activity may moderate the relationship between family variables and outcomes in rural low-income youth.

While in need of further exploration, the findings suggest that extracurricular involvement may have varied effects on youth outcomes, serving a compensatory role in some instances and inducing or exacerbating risk in others, namely as it pertains to substance use. Further investigation is needed to more fully understand the varied impact of extracurricular involvement in rural, low-income populations and how it may be affected by peer dynamics, adolescent employment status, and other competing family demands in a low SES environment.

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APPENDIX

Table A-1.

Means and Standard Deviations for Predictor and Outcome Variables

Variables	*M*	*SD*
Age	15.95	1.35
Family Cohesion	45.86	17.70
Family Expressiveness	45.65	11.35
Family Conflict	51.95	13.68
Family Moral-Religiosity	55.34	11.38
Truancy	4.19	7.39
Risky Sexual Behavior	4.29	4.79
Alcohol Use	3.04	3.35
Substance Use	1.38	3.31
Internalizing Problems	54.08	11.35
Externalizing Problems	55.28	10.73

Table A-2.

Correlations among Primary Study Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Family Cohesion	-													
2. Family Expressiveness	.44**	-												
3. Family Conflict	-.66**	-.28**	-											
4. Family Moral-Religiosity	.42**	.15**	-.37**	-										
5. Risky Sexual Behavior	-.17**	.03	.23**	-.25**	-									
6. Alcohol Use	-.14**	.004	.26**	-.22**	.56**	-								
7. Substance Use	-.18**	<.001	.27**	-.21**	.51**	.68**	-							
8. Internalizing Problems	-.39**	-.15**	.43**	-.27**	.13*	.11*	.17**	-						
9. Externalizing Problems	-.39**	-.07	.56**	-.37**	.44**	.44**	.41**	.53**	-					
10. Extracurricular Activities	.15*	.17**	-.04	.19**	-.12	.03	-.01	-.16*	-.12	-				
11. Truancy	-.13	.08	.09	-.11	.28**	.22**	.17**	.10	.12*	.03	-			
12. Age	-.09	.09	.06	-.003	.34**	.14**	.04	-.03	-.03	-.08	.21**	-		
13. Gender	-.18**	-.10	.09	.03	-.12*	-.25**	-.10	.26**	-.10	-.12	-.01	.06	-	
14. Ethnicity	-.01	-.002	.12	.02	.11	.15	.03	.09	.13	.03	.08	.16*	.13	-

Note. *$p < .05$; **$p \leq .01$; Pearson correlations were estimated between continuous variables; tetrachoric correlations between dichotomous variables; and biserial correlations between dichotomous and continuous variables.

Table A-3.
Parameter Estimates from the Model Predicting Outcomes

		Truancy			
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper	IRR
Age	0.199 (.02)**	0.491 (.05)	.40	.59	1.220
Gender	-0.014 (.05)	-0.012 (.05)	-.11	.08	0.986
Ethnicity	0.037 (.08)	0.025 (.05)	-.08	.13	1.038
Family Cohesion	-0.001 (.003)	-0.021 (.10)	-.22	.18	0.999
Family Expressiveness	0.018 (.004)**	0.366 (.08)	.21	.53	1.018
Family Conflict	0.002 (.004)	0.038 (.09)	-.14	.22	1.002
Family Moral-Religiosity	-0.004 (.004)	-0.086 (.08)	-.25	.08	0.996
Extracurricular Activity	-0.003 (.06)	-0.003 (.05)	-.10	.10	0.997
Coh X ECA	-0.030 (.01)**	-0.644 (.10)	-.84	-.45	0.970
Exp X ECA	0.010 (.01)+	0.145 (.08)	-.01	.30	1.010
Con X ECA	-0.008 (.01)	-0.145 (.10)	-.33	.04	0.992
Mre X ECA	-0.021 (.01) **	-0.300 (.08)	-.45	-.15	0.979
		Risky Sexual Behavior			
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper	
Age	1.14 (.17) **	0.323 (.05)	.23	.41	
Gender	-1.21 (.46)**	-0.124 (.05)	-.22	-.03	
Ethnicity	0.450 (.59)	0.036 (.05)	-.06	.13	
Family Cohesion	-0.017 (.03)	-0.062 (.09)	-.25	.12	

Table A-3 Continued

		Risky Sexual Behavior		
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper
Family Expressiveness	<0.001 (.03)	-0.001 (.08)	-.15	.15
Family Conflict	0.030 (.03)	0.085 (.09)	-.09	.26
Family Moral-Religiosity	-0.087 (.03)**	-0.208 (.08)	-.35	-.06
Extracurricular Activity	-0.651 (.45)	-0.068 (.05)	-.16	.03
Coh X ECA	0.046 (.04)	0.114 (.10)	-.07	.30
Exp X ECA	0.064 (.05)	0.105 (.07)	-.04	.25
Con X ECA	0.063 (.05)	0.125 (.09)	-.05	.30
Mre X ECA	0.012 (.05)	0.020 (.07)	-.12	.16
		Alcohol Use		
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper
Age	0.298 (.12)*	0.121 (.05)	.02	.22
Gender	-1.477 (.34)**	-0.217 (.05)	-.31	-.12
Ethnicity	0.737 (.43)	0.084 (.05)	-.01	.18
Family Cohesion	0.006 (.02)	0.031 (.10)	-.16	.22
Family Expressiveness	-0.010 (.02)	-0.035 (.08)	-.19	.12
Family Conflict	0.069 (.02)**	0.282 (.09)	.10	.50
Family Moral-Religiosity	-0.042 (.02)+	-0.144 (.08)	-.30	.01
Extracurricular Activity	0.242 (.33)	0.036 (.05)	-.06	.13
Coh X ECA	0.013 (.03)	0.048 (.10)	-.15	.24
Exp X ECA	0.045 (.03)	0.106 (.08)	-.05	.26

Table A-3 Continued

		Alcohol Use		
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper
Con X ECA	-0.012 (.03)	-0.034 (.09)	-.22	.15
Mre X ECA	-0.013 (.03)	-0.030 (.08)	-.15	.12
		Drug Use		
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper
Age	0.065 (.13)	0.027 (.05)	-.07	.13
Gender	-0.651 (.34)$^{+}$	-0.098 (.05)	-.20	.002
Ethnicity	0.181 (.44)	0.021 (.05)	-.08	.12
Family Cohesion	-0.029 (.02)	-0.156 (.10)	-.36	.05
Family Expressiveness	-0.005 (.02)	-0.016 (.08)	-.18	.14
Family Conflict	0.024 (.02)	0.100 (.10)	-.09	.29
Family Moral-Religiosity	-0.042 (.02)$^{+}$	-0.147 (.08)	-.31	.01
Extracurricular Activity	0.024 (.34)	0.004 (.05)	-.10	.10
Coh X ECA	0.071 (.03)**	0.257 (.10)	.05	.46
Exp X ECA	0.058 (.03)	0.139 (.08)	-.02	.30
Con X ECA	0.074 (.03)*	0.213 (.10)	.02	.40
Mre X ECA	-0.002 (.03)	-0.004 (.08)	-.16	.15
		Internalizing Problems		
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper
Age	-0.526 (.40)	-0.063 (.05)	-.16	.03
Gender	3.55 (1.1)**	0.155 (.05)	.06	.25

Table A-3 Continued

		Internalizing Problems		
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper
Ethnicity	1.21 (1.4)	0.041 (.05)	-.05	.13
Family Cohesion	-0.143 (.06)**	-0.223 (.09)	-.40	-.05
Family Expressiveness	0.037 (.07)	0.037 (.07)	-.11	.18
Family Conflict	0.184 (.07)**	0.222 (.08)	.06	.39
Family Moral-Religiosity	-0.146 (.07)**	-0.147 (.07)	-.29	-.01
Extracurricular Activity	-1.92 (1.1)+	-0.085 (.05)	-.18	.01
Coh X ECA	0.135 (.09)	0.141 (.09)	-.04	.32
Exp X ECA	-0.012 (.10)	-0.008 (.07)	-.15	.13
Con X ECA	0.142 (.10)	0.119 (.09)	-.05	.29
Mre X ECA	0.095 (.10)	0.065 (.07)	-.07	.20
		Externalizing Problems		
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper
Age	-0.663 (.34)*	-0.084 (.04)	-.17	.000
Gender	-2.69 (.92)**	-0.124 (.04)	-.21	-.04
Ethnicity	2.10 (1.2)+	0.075 (.04)	-.01	.16
Family Cohesion	-0.045 (.05)	-0.075 (.08)	-.24	.09
Family Expressiveness	0.063 (.06)	0.067 (.07)	-.06	.20
Family Conflict	0.402 (.06)**	0.513 (.08)	.37	.66
Family Moral-Religiosity	-0.165 (.06)**	-0.176 (.07)	-.30	-.05
Extracurricular Activity	-1.76 (.90)*	-0.082 (.04)	-.17	.001

Table A-3 Continued

	Externalizing Problems			
Parameter	Est. (S.E.)	Std. Est. (S.E.)	CI-lower	CI-upper
Coh X ECA	0.052 (.08)	0.057 (.09)	-.11	.22
Exp X ECA	0.109 (.09)	0.081 (.07)	-.05	.21
Con X ECA	0.005 (.09)	0.004 (.08)	-.15	.16
Mre X ECA	0.023 (.09)	0.016 (.06)	-.11	.14

Note. +$p < .08$; *$p < .05$; **$p < .01$; Confidence intervals are reported for standardized estimates. Results are from a single analysis simultaneously regressing each DV on the set of predictors; ECA = Extracurricular activity; IRR = Incidence Rate Ratios (exponentiated log of the expected count for truancy [count variable]).

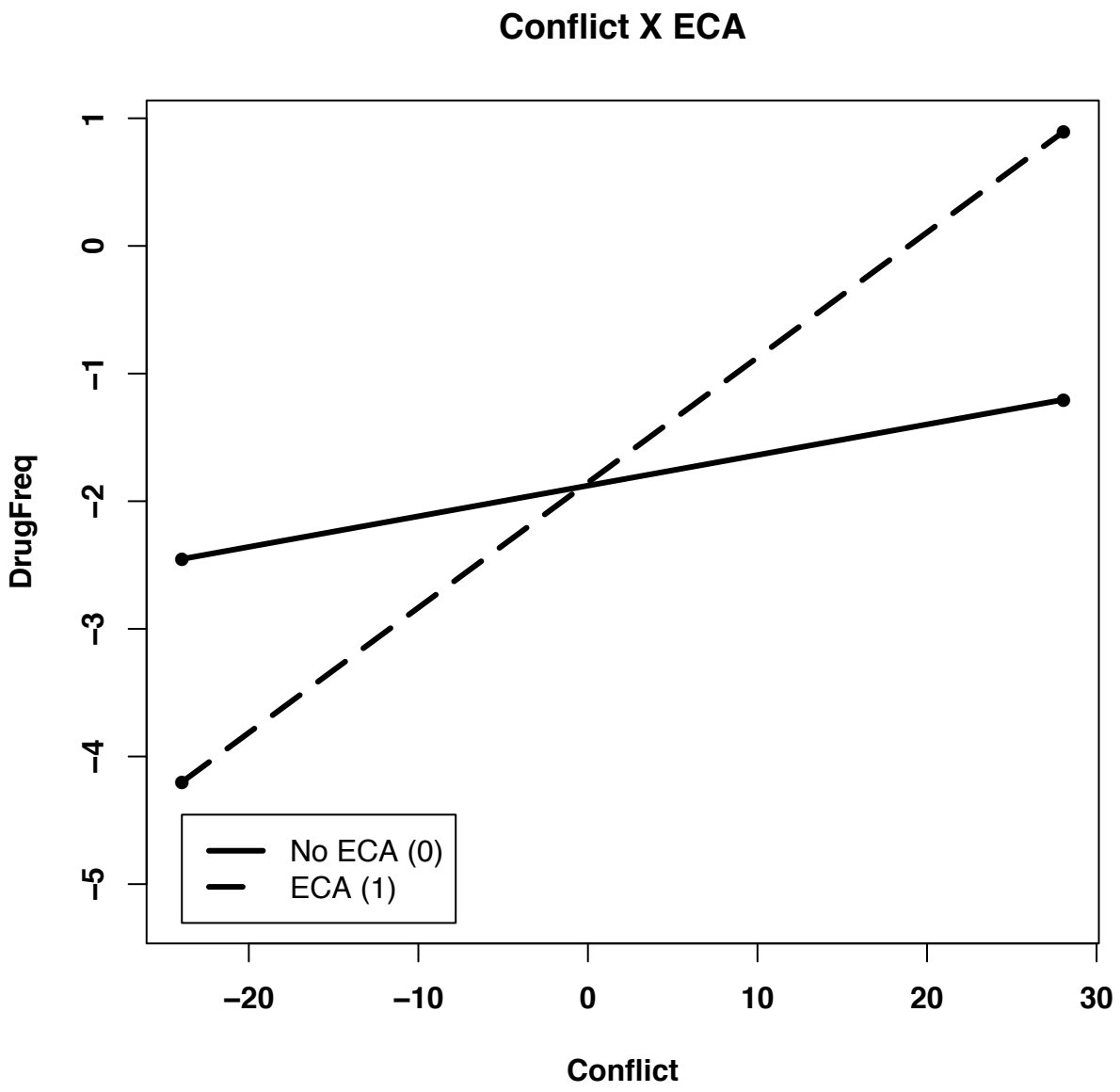

***Figure A-1*. Simple slopes of family conflict at values of extracurricular activity (ECA) predicting drug use**

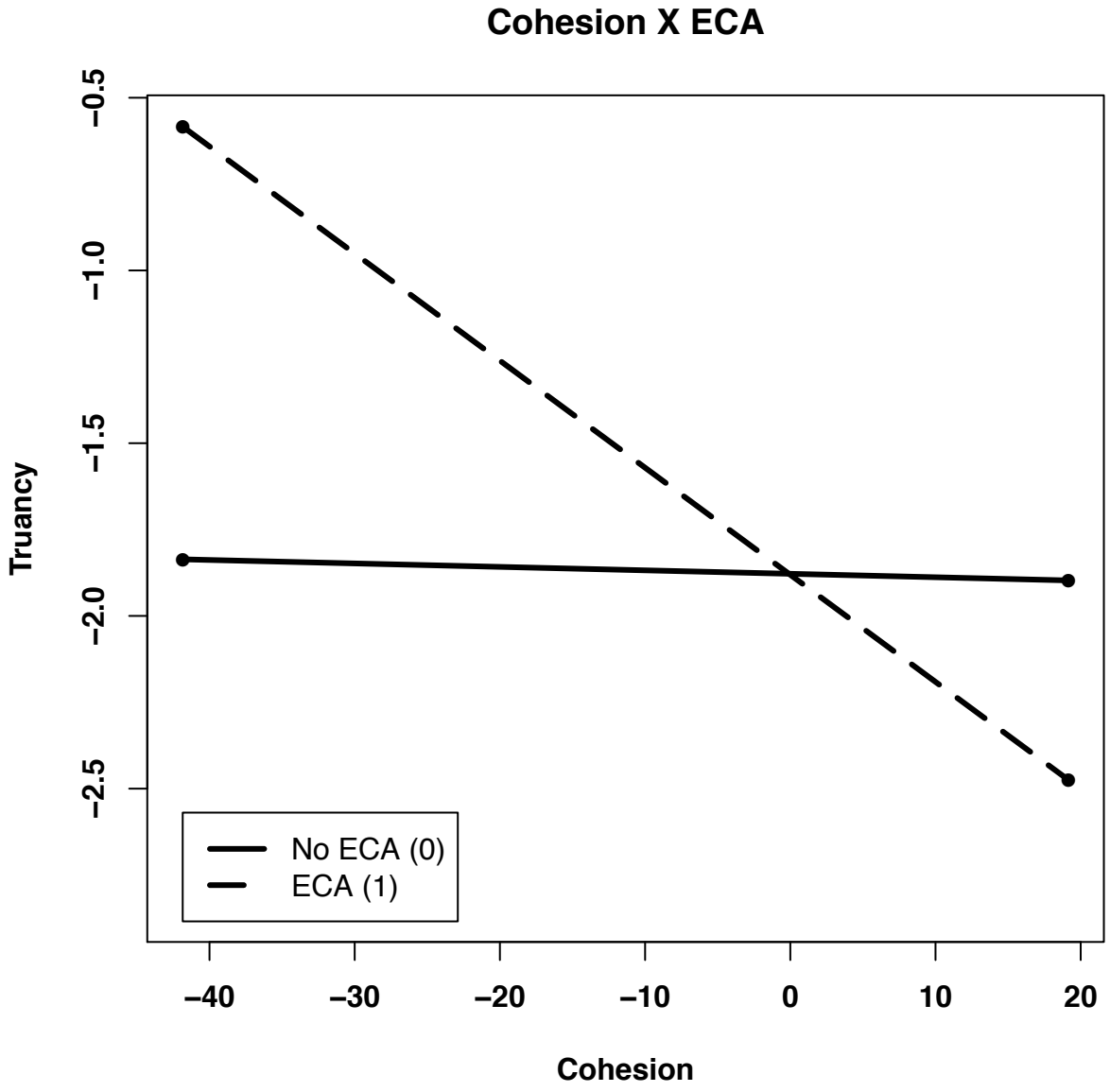

***Figure A-2*. Simple slopes of family cohesion at values of extracurricular activity (ECA) predicting truancy.**

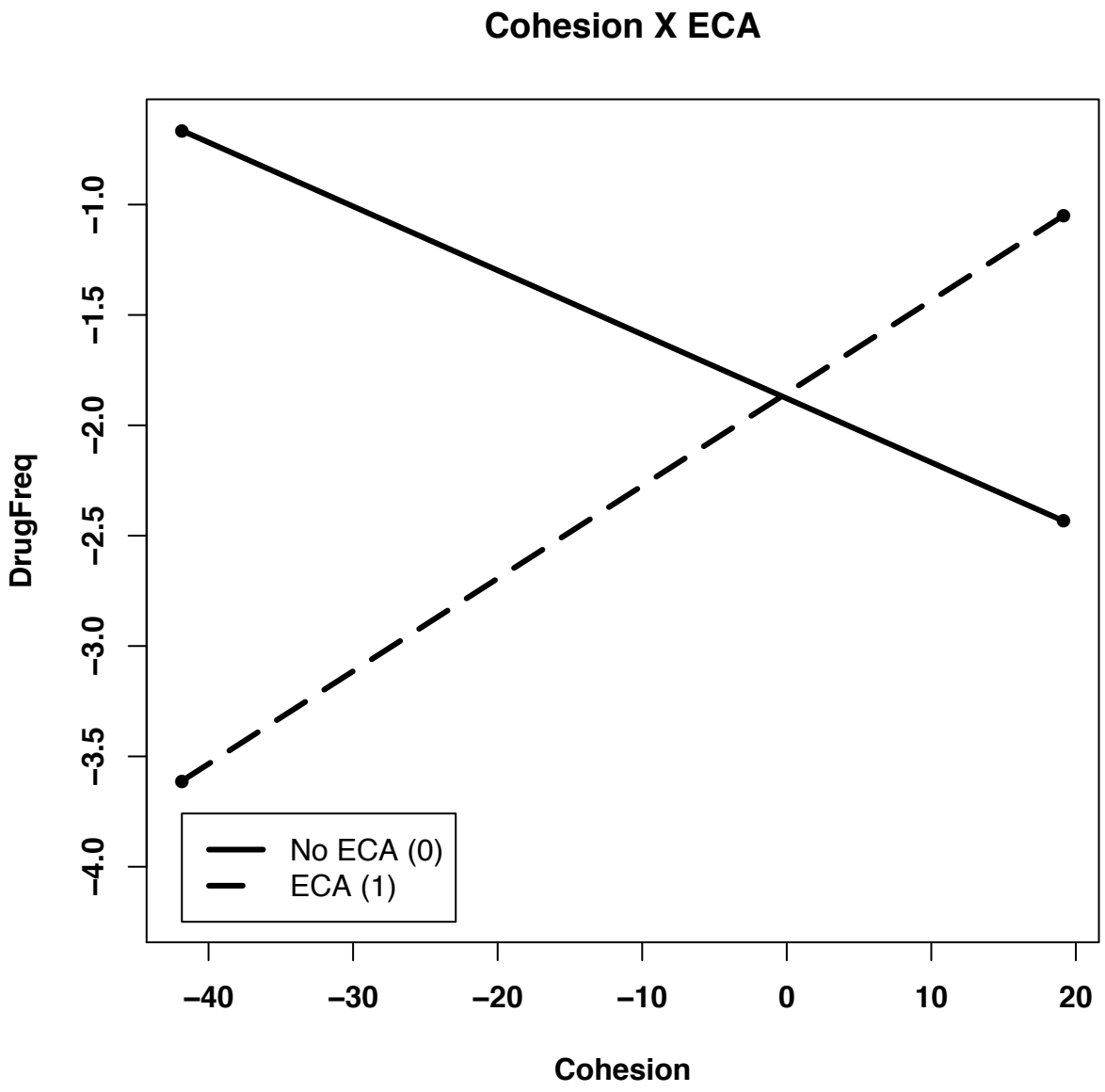

***Figure A-3*. Simple slopes of family cohesion at values of extracurricular activity (ECA) predicting drug use.**

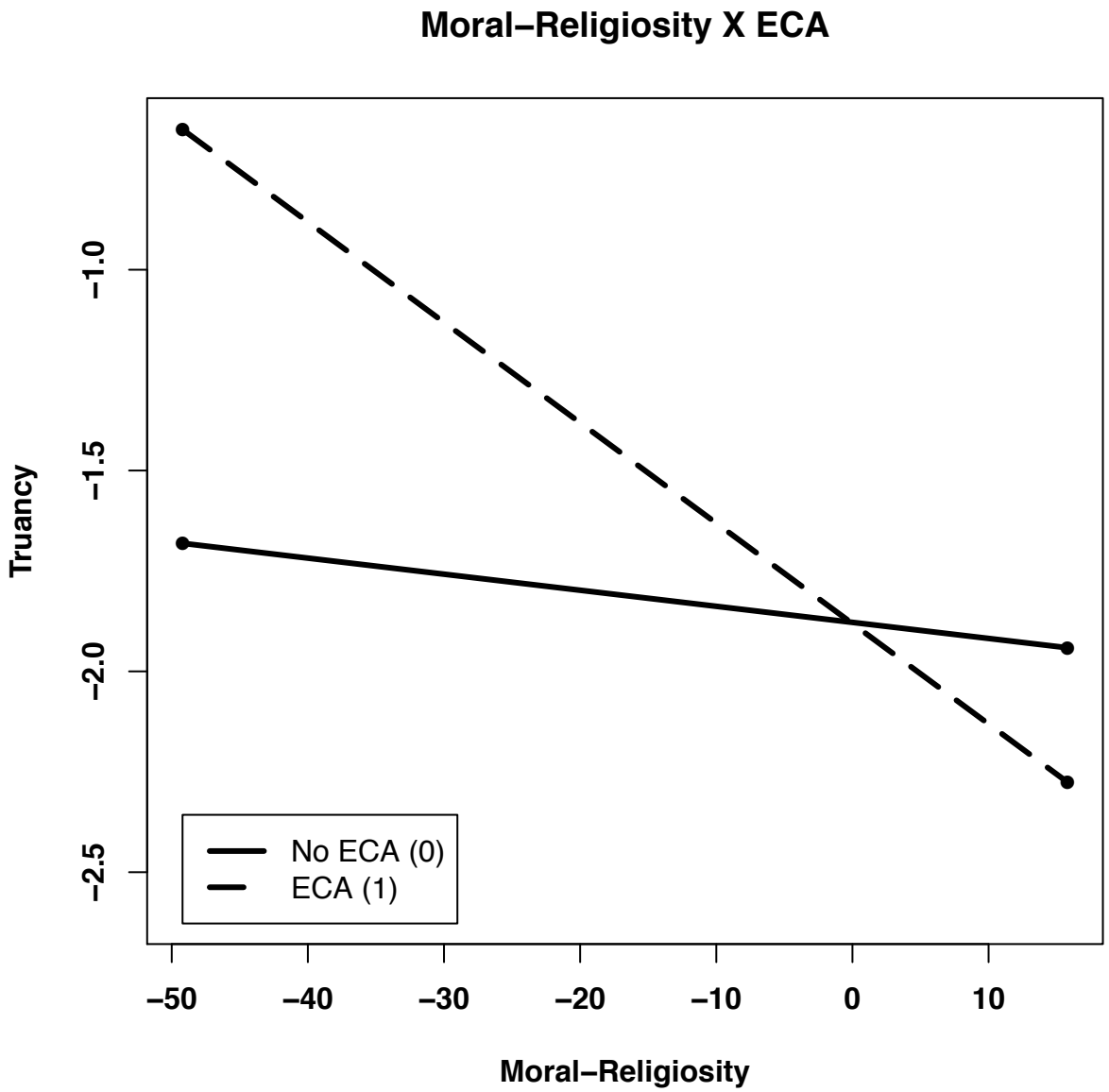

***Figure A-4*. Simple slopes of family moral-religiosity at values of extracurricular activity (ECA) predicting truancy.**

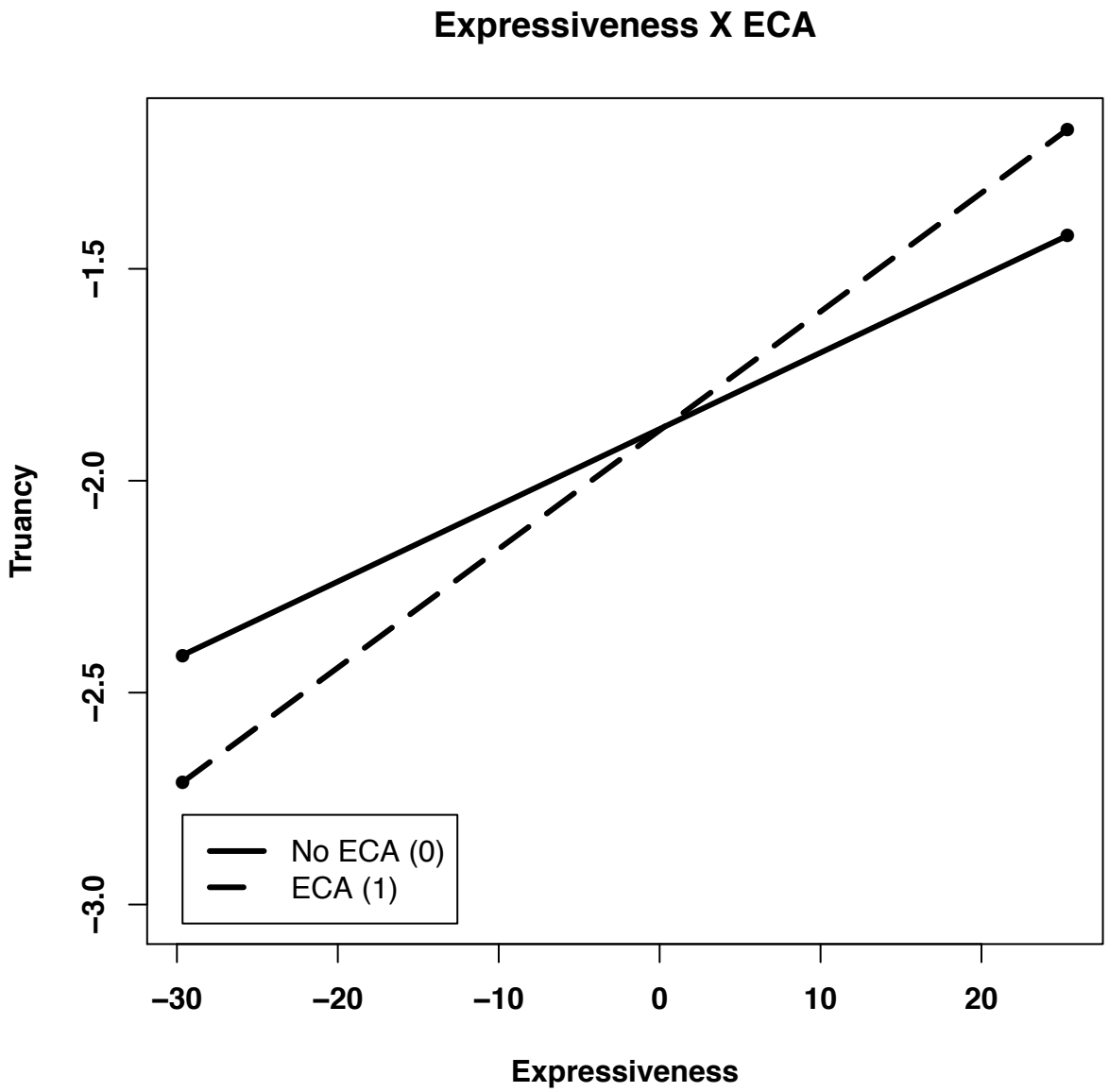

***Figure A-5*. Simple slopes of family expressiveness at values of extracurricular activity (ECA) predicting truancy.**

VITA

Rebecca Lee Shorter was born on August 15, 1986, in Chester, Pennsylvania. She graduated with honors from Ridley High School in Folsom, Pennsylvania, in 2004. Rebecca attended Lock Haven University of Pennsylvania and graduated *summa cum laude* with a Bachelor of Science degree in Biology (Cellular and Organismal) and Psychology in 2009. She received her Master of Arts degree in Clinical Psychology at the University of Tennessee-Knoxville in 2016.