

Mediators and Moderators
of the Gender Role-Substance Use Relationship
in Mexican American Adolescents

by

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ABSTRACT

The relationships between adaptive and maladaptive aspects of gender roles in predicting substance use were examined in a sample of 955 (450 boys, 505 girls) Mexican American 7th and 8th grade adolescents participating in a school-based substance use intervention. The moderating effect of linguistic acculturation, the mediating effects of antisociality, depressive symptoms, and adaptive and avoidant coping on gender role-substance use relationships were examined.

Correlational and path analyses supported the Functional Model of Gender Roles that considers these roles as adaptive or maladaptive social coping strategies. For boys, the path analyses yielded significant direct paths from aggressive masculinity to composite alcohol, cigarette, and marijuana use measures, with all other effects of gender roles on substance use operating through the mediators. Bootstrapped mediation tests yielded significant indirect paths, where for boys the positive relationships between assertive and aggressive masculinity with substance use and the negative relationship of affective femininity with substance use were mediated through antisociality, which is predictive of increased substance use.

For girls, the positive relationship between aggressive masculinity with cigarette and alcohol use and the negative relationship of affective femininity with alcohol and cigarette use were also mediated by adaptive coping, which is predictive of decreased substance use. A different set of significant indirect paths through avoidant coping connected assertive masculinity and submissive

femininity to alcohol use for boys. For boys, the paths from affective femininity to antisociality and adaptive coping were found to be moderated by linguistic acculturation, with the negative correlation of affective femininity with antisociality and positive correlation of this gender role with adaptive coping being stronger in boys low in acculturation. In turn, the pathway from this acculturation by affective femininity interaction to substance use was found to be mediated by antisociality.

The present analyses confirmed the importance of gender roles and their interaction with acculturation in predicting substance use in Mexican American adolescents. The analyses also were important in delineating functional mechanisms through which these gender roles have their effects, with implications for the design of interventions to reduce substance use in this population.

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“Promise me you’ll always remember: You’re braver than you believe, and stronger than you seem, and smarter than you think.”--Christopher Robin to Poo

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Mediators and Moderators of the Gender Role-Substance Use Relationship in Mexican American Adolescents

Latino adolescents in the United States constitute a very heterogeneous group. Latino is an umbrella label that encompasses youths of different Latin American national origins, levels of acculturation, socioeconomic status, migration history and many other contextual factors, such as place of the residence within the U.S. (Berry, 2006; Portes & Rumbaut, 2001; Wahl & Eitle, 2010). In terms of national origin, Mexican-heritage youth constitute the largest Latino subgroup and are predominantly located within the Southwest (U.S. Census Bureau, 2008).

In national U.S. surveys, Latino adolescents have been shown to be at high risk for substance use and abuse. Among 8th graders, Latino students have higher rates of use than non-Mexican heritage Whites and African Americans on nearly all legal and illegal substances. Latino 12th grade use rates for crack, heroin, methamphetamine, and crystal methamphetamine were below rates of use for Whites and above those for African Americans, although this seeming change in rank for drug use for Latino adolescents may be due to higher high school drop out rates for Latino high school students (Johnston, O'Malley, Bachman, & Schulenberg, 2011). Acculturation is an important factor in Latino substance use. Among Mexican heritage youth (ages 12-17) responding in the National Survey on Drug Use and Health, 19% of the U.S.-born and 13% of the Mexican-born immigrants reported alcohol use in the last 30 days with this difference narrowing with the immigrants' length of U.S. residence (Gfroerer & Tan, 2003).

Prior studies have established that gender role socialization is a factor in substance use for Latinos of Mexican heritage youth, both living in the U.S. and in Mexico (Lara-Cantu, Medina-Mora, & Gutierrez, 1990; Kulis, Marsiglia, Lingard, Nieri, & Nagoshi, 2008, Kulis, Marsiglia, & Nagoshi, 2010; Kulis, Marsiglia, & Nagoshi, in press). The research presented here is an extension of these previous studies by assessing the relationship of adaptive/positive and maladaptive/negative gender roles to substance use in a sample of Mexican American middle school youth. Based on the Functional Model of Gender Roles (Spence, 1984), the present research also advances existing knowledge by testing theoretically meaningful mediators of the gender roles-substance use relationship, including internalizing and externalizing psychopathology, and adaptive and maladaptive coping behaviors. Given the importance of changes in gender role socialization that are associated with the acculturation process for Mexican American adolescents (Strait, 1999), the present research also advances the literature by testing the moderating effects of acculturation and biological sex on the gender role-substance use relationship in an attempt to begin to elucidate the dynamic relationships between acculturation, gender roles, and substance use. Such analyses may illuminate some understudied mechanisms by which acculturation increases the risk for substance use in Mexican American adolescents. Finally, since gender roles are a product of childhood socialization, are linked to a wide range of psychological and social functioning, and are important for adolescent identity development, they are a particularly promising target for interventions to prevent substance use and misuse in adolescence.

The following discussion begins by considering how gender roles may account for sex differences in adolescent substance use and how such gender roles may be particularly important for understanding the substance use of Mexican American adolescents. Working from theories of gender roles that emphasize their socially adaptive and maladaptive aspects, gender role effects on substance use are considered in terms of theoretically relevant mediators, including externalizing and internalizing psychopathology and adaptive vs. maladaptive coping. Finally, these gender role effects are discussed in terms of the moderating effects of acculturation, which is especially of importance in understanding the substance use of Mexican American adolescents.

Sex Differences in Adolescent Psychological Adjustment and Substance Use

Sex differences are an important factor in understanding substance use (Kulis, Yabiku, Marsiglia, Nieri, & Crossman, 2007; Dakof, 2000; Ellis, O'Hara, Sowers, 2000; Freshman and Leinwand, 2000) and are key in understanding social phenomenon such as drug offers and the resistance process (Moon, Hecht, Jackson, & Spellers, 1999). Both biological and socially constructed gender differences affect the developmental trajectory of adolescents, highlighting the unique risk and protective factors that lead to substance use (Guthrie & Low, 2000; The National Center on Addiction and Substance Abuse [NCASA], 2003). It should be noted that feminine and masculine gender roles are not exclusively determined by biological sex, i.e., whether individuals are born male or female. Many men and women internalize the same gender cues, but endorse them to varying degrees (McCreary, Newcomb, & Sadava, 1998), and the Functional

Model of Gender Roles (Spence, 1984) discussed below highlights the idea that such gender roles can be conceptualized as different modes of social adaptation independent of their associations with gender.

Park, Mulye, Adams, Brindis, & Irwin's (2006) synthesis of risky behavior from U.S. nationally representative databases showed that adolescent and young adult males have higher rates of cigarette use, binge drinking, heavy alcohol use, illicit drug use, and substance abuse/dependence than females, but females have higher rates of serious mental illness. This suggests that developmental pathways to psychological adjustment problems and substance use may differ in important ways for boys vs. girls. Consistent with this idea, although girls progress more slowly than boys to drug use initiation, once girls begin to use, they progress faster to addiction than boys, when using the same amount of substances (Kauffman, Silver, & Poulin, 1997; NCASA, 2003; Schinke, Fang, & Cole, 2008). On the other hand, recent data from the Monitoring the Future (Johnston et al., 2011, p. 44) study indicate that while adolescent boys remain higher than girls on illicit drug use, adolescent girls have generally "caught up" with boys for alcohol and cigarette use.

Another complication in understanding sex differences in substance use is that sex differences may be changing over time. Schinke, Fang, and Cole's (2008) review of the literature suggested that adolescent girls are beginning to surpass adolescent boys in their substance use. Among 8th and 10th graders, girls drank more than their male counterparts, and girls were also more likely than boys to use inhalants and stimulants. Girls started smoking at younger ages, and they

subsequently smoked more regularly than boys. Previous research indicated that, once girls used drugs, they were more likely than boys to become dependent. Schinke et al.'s study found that where adolescent girls go after school, how they view and think about themselves, who their friends are, what their mothers know about their comings and goings, and whether their families articulate nonuse messages were associated with girls' use of alcohol, prescription drugs, and inhalants.

Tonin, Burrow-Sanchez, Harrison, and Kircher's (2008) study of Mexican heritage youth found that gender moderated the effect of youth attitudes on current use of alcohol and inhalants. The relationship between a youth's attitude toward drug use (e.g. "How wrong do you think it is for someone your age to drink beer, wine or hard liquor such as vodka, whiskey or gin regularly?") and current drug use was stronger for females than males. Rodriguez and Zayas (1990) note how Mexican culture instills less freedom, more deference, and more structure in social interactions, sheltering women from situations involving antisocial behavior. This effect may be particularly salient for girls as they become more acculturated and move away from the traditional family values associated with certain environments in Mexico such as rural communities and more traditional communities (Castro, Stein, & Bentler, 2009). These traditional values, or *familismo*, focus on family as a collective unit. As girls become more acculturated to the norms of mainstream U.S. society, they may shift to more individualistic attitudes towards family, where these girls may push away from the expected strong family ties. It would appear that social/cultural factors

working through gender roles are an important basis for understanding sex differences in adolescent substance use.

The developmental onset and changes during puberty can also lead to an increased likelihood of substance use for girls (Kulis, Marsiglia, & Nagoshi, 2010). For girls, the onset of puberty can affect their physical and emotional well-being, pose challenges to body image, lead to eating disorders, an increased likelihood of conflict with one's peers (LeCroy & Daley, 2001), and depression (NCASA, 2003), which are associated with an increased risk for substance use (Tanner-Smith, 2010). For boys, puberty can bring an increase in physical strength and body size (Vega & Gil, 1998), which requires some adjustment, and for both early adolescent boys and girls, early puberty may lead to associating with delinquent peers and subsequent antisocial behaviors. For example, in a study by Lynne, Graber, Nichols, Brooks-Gunn, & Botvin (2007) of 1,366 African American and Latino males and females assessed longitudinally across 6th, 7th, and 8th grades, early maturers reported higher mean levels of both aggression and delinquency at all time points, regardless of gender or ethnicity. Associating with delinquent peers in 6th grade fully mediated the association between early maturation and both aggression and delinquency at all time points.

Gender Roles: Masculinity/Instrumentality vs. Femininity/Expressivity

Although biological sex is an important predictor of substance use patterns, it is generally not malleable. In contrast, gender roles are the result of socialization and may be useful targets for intervention to prevent substance use and abuse. Beliefs in traditional Mexican feminine gender roles have been found

to be associated with lower substance use in girls, while beliefs in traditional masculine gender roles have been associated with greater substance use in boys (Kulis, Marsiglia, & Nagoshi, 2010, in press). In a study of Mexican American and non-Mexican heritage adolescents, Kulis, Marsiglia, and Hecht (2002) found that measuring masculine dominance was associated with higher frequency of recent drug use, particularly for boys' use of marijuana and hard drugs. Thus, this aspect of gender roles added explanatory power over and above the effects of biological sex.

Gender roles are defined as the stereotypical emotions, cognitions, and behaviors associated with being male or female that are presumably acquired through socialization (social learning, modeling, etc.). For males in Western societies, traditional gender roles typically promote being active, aggressive, and expressive of anger, but without displaying sadness (Block, 1983). These traditional male gender roles have been coined "masculine" or "instrumental" behaviors, i.e., focused on attainment of goals external to the social interaction process (Gill, Stockard, Johnson, & Williams, 1987). In turn, traditional gender roles in Western societies promote women to be passive, compliant, and expressive of sadness without showing anger (Block, 1983). These traditional female gender roles have been coined "feminine" or "expressive" behaviors, i.e., giving primacy to facilitating the social interaction process (Gill et al., 1987). This dimension of expressiveness has been shown to differentiate samples of men vs. women. Traditional gender roles may be particularly relevant to substance use in Mexican American adolescents, due to Mexican traditions of *machismo* and

marianismo that in some respects represent more extreme versions of traditional masculinity and femininity (Kulis, Marsiglia, & Hurdle, 2003; Kulis et al., 2008; Marsiglia, Miles, Dustman, & Sills, 2002).

Block (1983) provides a framework for understanding the distinctions between sex, gender roles, and personality by noting how even small biological personality differences between boys and girls are accentuated in complex ways by socialization into socially appropriate gender roles and by the different ways that mothers and fathers treat boys vs. girls in the socialization process. Mothers are typically the primary role model, since they spend the most time with both boys and girls in the early years of childhood. On the other hand, for fathers, greater sex differentiation in teaching behaviors was found (Block, 1983), which is consistent with previous research that shows how father's exert greater pressure than mothers for sex-appropriate behaviors (Maccoby, 1980).

Some parents' lesser willingness to allow girls to engage in rough and tumble, independent play leads girls to be more consistently socialized into the feminine gender role, though less harshly than for boys. A social relational approach to social problems emerges in girls in addition to the already present social expectations for feminine cognitions, emotions, and behaviors (Block, 1983). For girls, learning the feminine gender role tends to be *lesson learning* based on the imitation of a readily available daily model, i.e., the mother. For boys, learning masculine behaviors requires both a shift from identifying with the mother to identifying with the father and an extrapolation from the limited opportunities for observing father behaviors, thus this learning of the masculine

gender role tends to be an issue of *problem learning*. Coupled with parents' greater willingness to allow boys to engage in risky play, one can see where an instrumental approach to social problems, as discussed below, emerges in boys in addition to the already present social expectations for masculine cognitions, emotions, and behaviors.

Theoretical Framework: Functional Model of Gender Roles

Spence's (1984) Functional Model suggests that gender role socialization involves the learning of social behavioral adaptations that influence an individual's vulnerability to both stress and distress, and consequently, the amount of distress experienced. Spence argues that personality attributes are functionally adaptive through either masculine instrumentality (problem solving through individual assertiveness and competence) or feminine expressivity (problem solving through the maintenance of social relationships and emotional connections), which is then inversely related to pathology. For example, highly instrumental individuals are less likely to see events as being threatening and are more likely to effectively cope with stressful situations that arise (Nezu & Nezu, 1987; Towbes, Cohen, & Glyshaw, 1989). Highly expressive individuals are also less likely to have pathological problems, such as depression, due to their effective interpersonal skills and high levels of social support (Wells, 1980; Steenbarger & Greenberg, 1990).

Spence and Helmreich (1980), in fact, propose that androgyny, manifesting both masculine and feminine sex role behaviors, results in individuals who are more psychologically well-adjusted, because they are more behaviorally

flexible and have higher self esteem. Using such a framework with a sample of nursing students, Steenbarger and Greenberg (1990) found that femininity (sex role behaviors measured by the Bem Sex Role Inventory) predicted positive vocational adjustment and lower hostility, masculinity was associated with lower levels of depression, and androgynous individuals reported lower depression and vocational stress. Wells' (1980) study of a sample of adolescents similarly found that an androgynous identity was associated with good adjustment. Androgynous girls were found to have better social relations than all other adolescents, and androgynous boys and girls had the highest level of psychological adjustment of the four identity groups: masculine, feminine, androgynous, and undifferentiated.

On the other hand, aspects of gender roles may predict maladaptive psychological functioning among adolescents through internalizing (depression, anxiety, social withdrawal) or externalizing (impulsivity, sensation seeking, antisociality) problem behaviors (Oldehinkel et al., 2004), which are linked to substance use. As Toray, Coughlin, Vuchinich, and Patricelli (1991) note, one consistent finding reflecting gender differences in stress responses is the tendency for males to respond to stress with aggression, while females tend to internalize it.

Consistent with instrumentality and expressivity, some researchers have proposed differentiating between the adaptive and maladaptive aspects of masculinity and femininity by distinguishing between the socially desirable versus socially undesirable gender-related traits (Marsh & Myers, 1986; Ricciardelli & Williams, 1995; Russell & Antill, 1984). Aggressive (negative) masculinity is characterized by controlling behaviors and dominance, while

assertive (positive) masculinity is characterized by leadership, self-confidence, and self-competence. Submissive (negative) femininity is characterized by dependence on others and a sense of inadequacy, while affective (positive) femininity is characterized by emotional expressiveness, empathy, nurturance, and sense of family commitment. Another way of understanding this is that the maladaptive aspects of masculinity represent the extremes of instrumentality, where assertiveness becomes aggressiveness, and the maladaptive aspects of femininity represent the extremes of expressivity, where sensitivity to interpersonal relationships becomes emotional over-reactivity and social submissiveness (see Figure 1). This may explain some of the seemingly contradictory findings discussed below, in which gender roles seem to predict both adaptive and maladaptive psychological functioning. Using this schema, Williams and Ricciardelli (1999) found that high assertive masculinity and low affective femininity were predictors of greater alcohol-related problems for both adult men and women.

Gender Roles and Drug Use among Mexican American Adolescents

Studies have examined the relationships between biological sex, gender roles, and alcohol and drug use specifically in Mexican and Mexican American adolescents (Kulis, Marsiglia, & Hecht, 2002; Kulis et al., 2003; Kulis et al., 2008; Kulis, Marsiglia, & Nagoshi, 2010; Kulis, Marsiglia, & Nagoshi, 2011). Mexican culture traditionally is viewed as promoting two primary gender roles, *machismo* and *marianismo*. Positive aspects of machismo include honor, respect, bravery, and a deep sense of family commitment (Marsiglia et al., 2002).

Negative characteristics of machismo are invulnerability, patriarchal dominance, aggressiveness (Goldwert, 1983), which may be associated with infidelity, abandonment of children, risk taking, and domestic violence (Gutmann, 1996; Kulis et al., 2003). *Marianismo* can be characterized by positive characteristics, such as self-sacrifice, collectivism, family devotion, and the nurturance of others, but it also may promote undesirable characteristics like dependency, passiveness, and submissiveness (Kulis et al, 2003). As Strait (1999) summarizes, *marianismo* mandates that a woman has family duties, and her place is in the home.

Marianismo involves submission, sacred duty, self-sacrifice, and chastity.

For Mexican and other Latino populations, “*machismo*” and “*marianismo*” have been described as central gender role themes that influence the gender identity of both males and females (Kulis et al., 2008). *Machismo* is often equated with a Mexican male stereotype of hypermasculinity, commonly associated with male behaviors such as the perpetration of and tolerance for domestic violence, the abandonment of children, infidelity, and stubbornness in male-to-male relationships, alcoholism, and aggressive and risk-taking behavior (Gutmann, 1996; Ingoldsby, 1991). There is a second meaning of *machismo*, however, that is centered on positive traits such as respect, honor, bravery, dignity and responsibility to the family (Gutmann, 1996; Neff, 2001). The word *hombre* and *caballerismo* are sometimes used to capture these positive aspects of *machismo*. An *hombre* does not beat his wife, sees to his family responsibilities with honor and dedication, and is helpful in the home (Gutmann, 1996).

Similarly, men who value and engage in family caretaking exhibit high levels of

caballerismo (positive aspects of machismo) are giving, responsible, respectful of women, and do their best to take care of their families (Arciniega et al., 2008; Castro, Kellison, Boyd, & Kopak, 2010).

Marianismo can also represent both positive and negative aspects of female behavior. The word, *la mujer*, is sometimes used to capture the positive aspects of *marianismo*. *La mujer* is a capable and strong woman who presents a proactive role in her life, yet is still concerned with the nurturance and responsibility of her family (Rocha-Sanchez & Diaz-Loving, 2005). *La mujer abnegada* is a passive woman who endures bad male partners with patience and understanding, while sacrificing her personal needs and desires for the good of her family. She is selfless, submissive, and dependent, enacting the women's expected gender role of taking care of her children, spouse and the family home.

Although many individuals deviate from these traditional gender roles, these gender norms and expectations continue to be promoted and endorsed in Mexican culture by large numbers of men and women (Reyes Luna et al., 2004; Rocha-Sanchez & Diaz-Loving, 2005). The traditional Mexican gender roles, *machismo* and *marianismo*, play an important role in substance use among Mexicans and Mexican Americans. These traditional, more polarized, gender roles have been linked to strong gender differences in substance use among Mexican American girls versus boys (Kulis et al., 2003). Men who subscribe to more traditional gender beliefs (emphasizing high instrumentality and low expressivity) may engage in antisocial behavior and substance use in order to prove their masculinity or appear "macho" (Unger et al., 2006; Huselid and

Cooper, 1994). In Mexican culture, *machismo* and celebratory fiesta drinking emphasize binge drinking (Caetano and Medina-Mora, 1988), along with the ability to consume high levels of alcohol without losing one's self-control (Loury & Kulbok, 2007). Mexican cultural norms encourage men to drink when and where they like without large social consequences, while there is far less tolerance and acceptance of excessive drinking by women (Wycoff, 2000; Medina-Mora & Rojas Guiot, 2003). Adhering to traditional gender roles, women are encouraged to refrain from drinking out of concern for the negative effects that substance use has in undermining the collective values of *familismo* that emphasize one's personal obligation and contribution to the family (Perea & Slater, 1999).

Gender differences in age of drug use initiation for Mexican youth have also been found. The early initiation of Mexican males compared to Mexican females into alcohol and tobacco use has been linked to an increased likelihood to use other drugs (Wagner et al., 2005). In some regions of Mexico, however, the gender gap has narrowed for certain substances. For example, a large study of Mexico City students in middle and secondary schools found that alcohol and tobacco use were equally prevalent among both adolescent males and females, although the use of marijuana was more common among males (Villatoro et al., 2005).

In another study of Mexican adults, Lara-Cantu et al. (1990) found that, for men, assertive masculinity and affective femininity were associated with increased alcohol use, but submissive femininity and aggressive masculinity were associated with greater alcohol use problems. For women, aggressive masculinity predicted greater alcohol use, while affective femininity predicted less alcohol use

and fewer alcohol use social problems, such as violence and difficulties with a partner. For a sample of Mexican American adolescents, Kulis, Marsiglia, and Hurdle (2003) found that aggressive masculinity was highly predictive of greater drug use for both boys and girls, while assertive masculinity, affective femininity, and submissive femininity were found to be moderately, but inconsistently predictive of lesser drug use. Inconsistencies in the findings for assertive masculinity and both affective and submissive femininity may be due to other moderating factors such as acculturation. A study by Kulis et al. (2008) differentiated between adaptive and maladaptive gender roles in predicting substance use among Mexican adolescents. In general, aggressive masculinity was predictive of greater substance use, while affective femininity was predictive of lower substance use for both boys and girls. Significant gender-specific effects were found only for affective femininity, which predicted less cigarette use among boys but not among girls, and aggressive masculinity, which was a stronger predictor of sharing or selling drugs for boys than for girls. Similar to the findings described below, femininity was found to be predictive of less externalizing behavior, while masculinity was predictive of more externalizing behavior in boys.

In summary, gender roles have been theorized to be important bases for child and adult social adaptation, while empirical studies have consistently demonstrated the relationships of gender roles with psychopathology and substance use in adolescence. A few studies have shown that gender roles are predictive of psychopathology and substance use in Mexican American

adolescents, and aspects of Mexican culture suggest that gender roles may be particularly important for understanding Mexican American psychological functioning.

Internalizing/Externalizing Behaviors as Mediators of the Gender Role-Substance Use Relationship

The relationship of gender roles to substance use may be due to the relationships of gender roles to internalizing and externalizing problem behaviors (Achenbach & Rescorla, 2001). Prior research has shown a relationship between externalizing problem behaviors and substance use (e.g., Fergusson, Horwood, & Ridder, 2007; Timmermans, van Lier, & Koot, 2008) and between internalizing problem behaviors and substance use (e.g., Brook, Ning, & Brook, 2006) in adolescents. On the other hand, it should be noted that there is a lack of literature connecting problem behaviors and substance use specifically to Mexican and Mexican American adolescents. For example, in a sample of children longitudinally assessed from the starting age of 4 or 5 to 18 years of age, Timmermans, van Lier, and Koot (2008) found that externalizing problems and physical aggression were the best predictors of later adolescent substance use and risky sexual behavior for both boys and girls. Dakof (2000) found that drug-using girls referred for treatment not only use drugs and engage in externalizing behaviors as extensively as their male counterparts, but are also distinguished by their higher levels of internalizing symptoms and family dysfunction. Dakof suggests that girls get a double dose of symptoms, the internalizing symptoms

more common in adolescent girls irrespective of drug use and the externalizing symptoms prevalent in drug users irrespective of gender.

Research has shown that gender differences in adolescent internalizing and externalizing problem behaviors can, in fact, be accounted for by gender differences in traditionally defined gender roles of masculinity and femininity (Hoffmann, Powlishta, & White, 2004; Huselid & Cooper, 1994). Huselid and Cooper (1992) also found that traditional gender roles mediate the sex difference in alcohol use in adolescents. Masculinity/instrumentality has been shown to be inversely correlated with internalizing problem behaviors in young men and women (Sanfilipo, 1994) and positively related to externalizing problem behaviors in adolescent boys (Huselid & Cooper, 1994; Payne, 1987). Adolescent boys tend to manifest distress through outward externalizing problem behaviors, such as delinquency, drinking problems, substance abuse (Huselid & Cooper, 1994) and antisocial behaviors, such as aggression and conduct disorders (Hoffmann et al., 2004; Lemle & Mishkind, 1989). Male aggressive behavior has specifically been linked with negative social and mental health consequences, such as substance use (Wagner, 1996). Huselid and Cooper (1994) found that traditional male gender roles (independence, assertiveness) were directly correlated with externalizing problem behaviors in adolescent males, but were unrelated to internalizing problem behaviors. More specifically, traditional male gender roles have been linked with greater alcohol involvement (Loury & Kulbock, 2007) and delinquent status among male adolescents (Lemle & Mishkind, 1989). Masculinity has also been found to mediate gender differences

in depression (Wilson & Cairns, 1988), i.e., to the extent that adolescent males scored lower than adolescent females in depression, this could be partially attributed to the males' higher scores on instrumentality.

Adult women report higher levels than men of psychological distress, depression, low self-esteem (Huselid & Cooper, 1994), anxiety, and somatic complaints (Hoffmann et al., 2004). Traditional female gender role attitudes have been linked with turning distress inward and with consequent internalizing problem behaviors in females (Landrine, 1989). In his study of young men and women, Sanfilipo (1994) found that femininity predicted greater dependency but lower depression for both sexes. On the other hand, Huselid & Cooper (1994) found that for adolescent females, having traditional feminine gender role values, such as submissiveness and dependency, was not correlated with internalizing problem behaviors, but was associated with reduced rates of externalizing problem behaviors, including antisocial behavior, substance use, drinking, delinquency, and aggression. These findings suggest that certain traditional female gender roles may be protective against expressing externalizing problem behaviors by encouraging less drinking and fewer alcohol problems among female adolescents (Zucker, Battistich, & Langer, 1981). However, it is less clear whether submissive femininity is predictive of greater internalizing problem behaviors in adolescent females.

With regard to Mexican Americans adolescents, females' socialization into a subordinate traditional gender role may contribute to their internalizing problem behaviors. For example, Benjet and Hernandez-Guzman (2002) assessed

adolescents from Mexico City and found that pubertal change was associated with greater depression in adolescent females, but no change in psychological adjustment in adolescent males. The researchers also found that age was associated with a decrease in self-esteem and subsequent increase in internalizing in Mexican girls but not boys, which is consistent with the gender-based socialization process for girls. *Machismo*, with its emphasis on restricted emotionality, also has been found to be associated with greater stress and depression in Mexican American men (Fragoso & Kashubeck, 2000). Meanwhile, for a sample of adolescent Latina girls, the value of familism has been found to be associated with greater internalizing but lower parent-adolescent conflict, with greater internalizing increasing and lower parent adolescent conflict decreasing the risk for suicide attempts (Kuhlberg, Pena, & Zayas, 2010). Maladaptive gender roles were significantly correlated with internalizing and externalizing problems for both Mexican American boys and girls in the study by Kulis et al. (2010). Although maladaptive gender roles significantly predicted higher alcohol use in girls, this effect was almost completely mediated by internalizing problems and externalizing problems.

Based on the preceding literature review, it is hypothesized that aggressive masculinity predicts externalizing/antisocial behaviors, and submissive femininity predicts internalizing/depressive behaviors, which will mediate the relationships between aggressive masculinity, submissive femininity, and substance use.

Adaptive and Avoidant Coping as Mediators of the Gender Role-Substance Use Relationship

Based on Spence's (1984) functional model of gender roles, one hypothesis is that the relationship between gender roles and externalizing/antisocial behaviors and internalizing/depressive behaviors is due to the learning of maladaptive coping behaviors. Thus a possible mediational pathway between gender roles and substance use may be through adaptive vs. maladaptive coping. In the Formative Years study (NCASA, 2003), girls who earlier reported an avoidant coping style of waiting and hoping things would get better, avoiding the problem by not thinking about it, or at times using alcohol or drugs to make themselves feel better, were more likely to report later alcohol use, binge drinking, and illegal drug use. Those reporting a more adaptive coping style, such as talking with someone about their problem, were less likely to have later alcohol use. Ohannessian et al.'s (2010) study of high-risk adolescents similarly found that more active coping was predictive of lesser alcohol use, while more avoidant coping was predictive of greater alcohol use, and better coping strategies have also been linked to lower risk for adolescent depression and anxiety (Glyshaw, Cohen, & Towbes, 1989). One possible mediational pathway is that the instrumental aspects of positive masculinity would be predictive of active coping behaviors, such as planning and problem solving, while the emotionally expressive aspects of positive femininity would be predictive of adaptively seeking social support. On the other hand, aggressive masculinity would be predictive of maladaptive coping through anger and aggression, while submissive femininity would be predictive of maladaptive avoidant coping behaviors.

Broderick and Korteland (2002) found that gender roles were significant predictors of coping styles and depression in early adolescents, with femininity being associated with greater adult support seeking, positive emotional expression, and rumination. Masculinity was associated with greater negative emotional expression. Androgyny, having both strong masculine and feminine gender behaviors, was associated with greater active problem solving. Participants' implicit beliefs about what constituted appropriate coping behavior were also linked to gender, with both genders believing that men should not ruminate but that they should distract themselves from problems.

Washburn-Ormachea, Hillman, and Sawilowsky (2004) found in their sample of 8th and 9th graders that androgyny was associated with greater active and acceptance coping, while femininity was associated with greater emotion-focused coping. Lengua and Stormshak (2000) found that in college students, masculinity predicted more active coping and less avoidant coping, while the opposite pattern was found for femininity. Personality variables did not account for the effects of gender or gender roles on coping or symptoms, but rather gender roles and personality each predicted unique variance in those variables.

Based on the preceding literature, it is hypothesized that assertive masculinity and affective femininity predict positive/adaptive coping, which will partially mediate the relationship between gender roles and substance use. Submissive femininity is hypothesized to predict negative/maladaptive coping, and thereby partially mediate the relationship between gender roles and substance use.

Acculturation as a Moderator of the Gender Role-Substance Use

Relationship

Acculturation has been defined as an ongoing process through which people from one culture adjust and adapt to another culture. Recently immigrated Mexican Americans and their offspring need to cope with a variety of stressors as they adjust to their new communities. During the acculturation process, there is typically socialization into the host dominant culture and a desire to become a part of the new culture. At the same time, there are pressures and desires to retain one's identity from one's culture of origin (Berry, 2006; Marsiglia, Kulis, Wagstaff, Elek, & Dran, 2005). In addition to cultural changes, this process typically involves changes in attitudes and behaviors resulting from "continuous first hand contact" with elements of the new cultural environment (Berry, 2006; Redfield, Linton, & Herskovits, 1936).

Greater acculturation, as indicated by English language acquisition (frequency of use, and also linguistic proficiency) (Marin & Gamboa, 1996), has been associated with higher levels of risk for substance use among some Mexican-heritage youth (Marsiglia, Kulis, Hussaini, Nieri, & Becerra, 2010). In terms of acculturation, English language acquisition may introduce and reinforce behaviors that are perceived to be acceptable by the mainstream U.S. culture, such as girls' drinking, while introducing value conflicts with the culture of origin (Gilbert & Cervantes, 1986; Vega, Zimmerman, Warheit, Apospori, & Gil, 1997). Second, English language acquisition may increase one's acculturation stress, as the youth attempts to resolve conflicting cultural issues. As a consequence, this

acculturation stress may be maladaptively dealt with through drug use (Gil & Wagner, 2000; Kulis, Marsiglia, & Nieri, 2009).

Gender differences in the relationship of acculturation to substance use in Mexican heritage adolescents suggest that gender roles may be important. Adolescents' gender role expectations can change as youth transition to the gender role expectations of the new culture and thus affect their substance use. Strait (1999) notes how less acculturated Mexican heritage adolescents show the greater differences in gender roles and beliefs about gender than more acculturated adolescents, i.e., these less acculturated adolescents perceive men and women to be more different from each other in behaviors and social roles. Similarly, relative to more acculturated youth, less acculturated adolescents show greater gender differences in substance use (Kulis et al., 2003). Acculturation may affect a Mexican American youth's ability to continue to conform to their traditional gender roles, *marianismo* and *machismo*, that are associated with their culture of origin and thus may increase the likelihood of substance use.

Immigrant women with initially low rates and levels of alcohol use are more likely than their male counterparts to adopt the drinking patterns of the majority culture during the acculturation process (National Institute on Alcoholism and Alcohol Abuse, 1997). Consistent with prior developmental research, women's rates of initiation and continued alcohol use increase at a faster pace than males through the acculturation process (Collins & McNair, 2002). For Mexican women, this increased substance use may be due to a greater acceptance and adoption of individualist values that weaken collectivist values and diminish

concern about the impact that substance use will have on family and friends. The acculturation process also facilitates the access of Mexican women to larger social networks that are less constraining regarding women's substance use (Kulis et al., 2010).

Traditional Mexican gender roles have been shown to have an impact on the acculturation process as women immigrants transition to Mexican American culture (Kranau, Green, & Valencia-Weber, 1982). For Mexican American girls, the transition from the restrictions on social experiences associated with *marianismo* to a wider, more diverse set of social contacts, and exposure to less conservative substance use norms that come with living in the U.S., is a much more profound change than is the case for Mexican American boys. The traditions of *machismo* for boys already allow for considerable freedom from parental restrictions and encouragement of peer relationships, making the transition to U.S. culture and its permissive substance use norms less of a change (Kulis et al., 2010). Thus, it would be expected that acculturation would have more of an impact on the relationships between gender roles and substance use among Mexican American girls than boys.

Kulis, Marsiglia, and Hurdle's (2003) study of Mexican American adolescents provided suggestive evidence of the moderating effect of acculturation on the gender role-substance use relationship. With language use as the measure of acculturation, it was found that assertive masculinity was positively associated with drug use only for low acculturated Mexican American boys, while submissive femininity was negatively associated with drug use for

high acculturated Mexican American girls. Affective femininity was negatively associated with drug use for high acculturated Mexican American girls.

A study by Kulis, Marsiglia, and Nagoshi (in press) found that assertive and aggressive masculinity were significantly positively predictive, while affective femininity was negatively predictive of substance use only for boys *low* in linguistic acculturation. This was interpreted in terms of the effects of gender role socialization into values of *machismo* emphasizing aggressiveness and ability to consume alcohol as a sign of manhood for boys from recently immigrated families. In contrast, aggressive masculinity was predictive of marijuana use only for girls *high* in linguistic acculturation. This was interpreted in terms of the loss of the protective effects of *marianismo* for girls from more acculturated families.

It should be noted that the above studies used language use as a proxy for acculturation, and linguistic acculturation was used as the measure of acculturation for the present research. A unidimensional approach to acculturation conceptualizes the process as movements along a single continuum, ranging from the immersion in one's culture of origin to the immersion in the dominant or host culture. From a more individualized person-level of analysis, acculturation has been conceptualized as a facet of one's cultural identity, entailing key components of cultural practices, values, and identification (Schwartz, Unger, Zamboanga, & Szapocznik, 2010).

Measures (e.g., Linguistic Acculturation, Acculturation Rating Scale for Mexican Americans; Short Acculturation Scale for Hispanics) using a unidimensional model of acculturation have tended to rely on several behavioral,

cognitive, and attitudinal domains regarding language acquisition, language use, frequency of participating in cultural practices, interpersonal relationships, cultural identity, family beliefs, and adherence to traditional values. Other researchers have relied on proxy variables, such as generational status, age at immigration; proportion of life spent in the United States, years lived in the new country, place of birth, and place of education to measure acculturation. These proxy measures assume that acculturation can be inferred from the amount of exposure individuals have to the dominant culture.

Studies with various populations have demonstrated both the importance of language and its strong impact on learning, cultural adaptation, and socialization (Heath, 1983; Ochs, 1988; Wahl & Eitle, 2010). In the U.S., non-English speaking immigrant children learn English in part through their involvement in social interactions. Thus, beyond learning new words and their meanings, they also construct cultural identities, beliefs, and cultural symbols in ways that vary distinctly from other forms of learning (Alvesson & Karreman, 2000). Within this context, the youth may desire to become a member of a new dominant cultural group or community, motivated by the apparent universal desire or need “to belong” or “to fit in” (Smith, Spillane & Annus, 2006). For example, Ardila (2005) discusses how the use of language, such as Spanglish (a language combining elements of English and Spanish, the result of the continual interaction of Latin American Spanish speakers with American English speakers in U.S. society) words, is tailored according to an individual’s specific circumstances and social needs, where a constant creative process is observed.

The use of code-switching describes a linguistic phenomenon in bilinguals where, at a certain point, the speaker changes the initial language of use and instead continues talking in another language. The switch can be produced when beginning a new sentence or a new topic.

The acquisition and use of English by Mexican heritage immigrants within the United States has often been used as a proxy for the multidimensional acculturation construct. Moreover, language has consistently appeared as the principal component, that is, the dominant factor in measures of acculturation (Cuellar, Arnold, & Maldonado, 1995) primarily because English language proficiency is a cultural skill that governs the person's ability to interact and communicate with members of the majority culture (Unger, Ritt-Olsen, Wagner, Soto, & Baezconde-Garbanati, 2007). Although language constitutes only one dimension of acculturation, previous studies have found that measures of English language use (linguistic acculturation) are comparable to multi-dimensional measures of acculturation. In this regard, linguistic acculturation accounts for the majority of the variance in predicting acculturation status (Cuellar, Harris, & Jasso, 1980; Samaniego & Gonzales, 1999; Epstein, Botvin, & Diaz, 2001; Serrano & Anderson, 2003). Regarding the aforementioned effect of linguistic acculturation, a study that used factor analysis concluded that the language domain accounts for most of the measured variance in acculturation (Coronado et al., 2005).

Furthermore, in daily life activities, language has a significant impact on youth's psychological and behavioral expressions and sociocultural changes (Sam

& Berry, 2010). Unfortunately, higher levels of acculturation among various Latino groups have also been linked to higher rates of substance use and dependence (Epstein et al., 2001). Studies conducted within different regions of the United States show that Latino youth who speak Spanish at home also report significantly *lower* rates of substance use, as compared with Latino youth who speak English with their parents (Hernandez, Eaton, Fairlie, Chun, & Spirito, 2010). Also in relation to these effects, bilingual/bicultural youth have also been found to be at a somewhat greater risk of substance use when compared with monolingual Spanish speaking youths (Epstein et al., 2001; Marsiglia & Waller, 2002).

Previous research has thus provided suggestive evidence of the importance of gender roles in the development of substance use in Mexican American adolescents, the crucial role that acculturation plays in the gender roles-substance use relationship, and the importance of English language acquisition and use in the acculturation process. The analyses reported here are significant in not only attempting to replicate these previously found relationships between positive and negative gender roles and substance use in Mexican American adolescents, but in also testing these relationships within a theoretical framework that considers the adaptive and maladaptive aspects of these gender roles for social and psychological functioning. The analyses also consider the moderating effects of linguistic acculturation on these functional relationships between gender roles and substance use. Such a comprehensive approach has the potential for identifying novel mechanisms that increase or decrease the likelihood of problematic

behaviors in Mexican American adolescents, mechanisms that can then be targeted for culturally-sensitive interventions.

Hypotheses

The hypotheses begin with the established findings in the literature of relationships between adaptive and maladaptive gender roles and substance use in Mexican American adolescents. Based on the Functional Model of gender roles (Spence, 1984) and the conceptualization of adaptive vs. maladaptive gender roles ((Marsh & Myers, 1986; Ricciardelli & Williams, 1995; Russell & Antill, 1984), Hypotheses 2 and 3 consider different mediators of the gender role-substance use relationships. Based on the research on gender roles, biological sex, and adolescent psychopathology (e.g., Hoffman et al., 2004) and the research on the effects of acculturation on gender roles in Mexican American adolescents (e.g., Strait, 1999), Hypothesis 4 considers how biological sex and linguistic acculturation may moderate the mediational pathways between gender roles and substance use.

H₁: Adaptive gender roles, affective femininity and assertive masculinity, will be negatively correlated with substance use for both boys and girls.

Maladaptive gender roles, aggressive masculinity and submissive femininity, will be positively correlated with substance use for both boys and girls.

H₂: For both boys and girls, assertive masculinity and affective femininity will be positively correlated with adaptive coping, but negatively correlated with antisociality. Aggressive masculinity will be positively correlated with

antisociality, while submissive femininity will be positively correlated with depressive symptoms and avoidant coping (Figure 2).

H₃: Building on Hypothesis 2, the positive relationship of aggressive masculinity with substance use will be mediated by maladaptive externalizing behaviors, antisociality. Similarly, the negative relationships of assertive masculinity and affective femininity with substance use will be mediated by maladaptive externalizing behaviors, antisociality. The relationship of submissive femininity to substance use will be mediated by internalizing behaviors, depression and avoidant coping. These mediational pathways will apply to both boys and girls (Figure 2). To the extent that assertive masculinity and affective femininity are negatively related to substance use, this relationship will be mediated by the positive relationship between these positive gender roles and adaptive coping behaviors for both boys and girls (Figure 2).

H₄: It is expected that the relationship of aggressive masculinity and affective femininity with substance use will be strongest for *low* acculturated Mexican American boys (Kulis et al., in press). As shown in Figure 3, for boys there is an expected linguistic acculturation by aggressive masculinity interaction that is mediated by antisociality and an expected linguistic acculturation by affective femininity interaction that is mediated by antisociality. As discussed in Kulis et al. (in press), low acculturated Mexican American boys are likely to adhere to the exaggerated masculinity derived from the tradition of *machismo*, where higher levels of such masculinity, particularly higher aggressive masculinity and lower affective femininity, are associated with greater ability to

consume alcohol. This link between traditions of masculinity and drug use is likely attenuated as Mexican American boys are socialized within mainstream American cultural norms.

H₅: It is expected that the relationship of aggressive masculinity and submissive femininity with substance use will be strongest for girls who are the *highest* in acculturation (Kulis et al., 2010, in press). Figure 4 thus shows an expected linguistic acculturation by aggressive masculinity interaction that is mediated by antisociality and an expected linguistic acculturation by submissive femininity interaction that is mediated by depression and maladaptive coping. The study by Kulis et al. (2010) suggested that such high aggressive masculinity in Mexican American adolescent girls may, in fact, be indicative of internalizing and externalizing psychopathology, which mediates the relationship between aggressive masculinity and substance use. Meanwhile, the Kulis et al. (in press) study suggested that high acculturated Mexican American girls are likely to have lost the adherence to the exaggerated femininity and familism derived from the tradition of *marianismo*, which acts as a protective factor against drug use. For high acculturated girls, the rejection of such traditional gender role values, as indicated by higher aggressive masculinity, is associated with greater antisociality and drug use. For low acculturated girls, the relationships among gender roles, antisociality, and drug use are expected to be attenuated due to the moderating effects of *marianismo*.

Method

The proposed research capitalized on an existing large data set of mostly Mexican American adolescents to test the hypothesized model depicted in Figures 2 to 4.

Data and Participants

The data used for the present analyses came from the Drug Resistance Strategies (DRS4) study, a NIDA R01-funded 5-year longitudinal randomized trial of an adapted and enhanced version of the keepin' it REAL universal prevention intervention targeting adolescent substance. Data were collected from 7 Phoenix, AZ, school districts, 32 schools, 96 teachers, and 3,038 students (PIs: M.L. Hecht at Pennsylvania State University and F. F. Marsiglia and S. Kulis at ASU). The study developed and tested two types of adaptations to the keepin' it REAL model program, which was already established as efficacious in a version for 7th graders. One adaptation modified the program for use with 5th grade students, and another made changes and added lessons to address acculturation issues connected to substance use risk. The study assessed whether increasing the dosage and adding acculturation related material enhanced the effectiveness of the intervention, and examined the most efficacious age of intervention, 5th versus 7th grade (see Hecht et al., 2008, for a detailed study and sample description). Surveys were conducted at several points in time, including a pre-test in Fall of 5th grade and 5 post-tests, with the last post-test occurring in the 8th grade.

The analyses for this research were based on already collected data from two waves, Wave 5 (Spring semester, 7th grade) and Wave 6 (Spring of 8th grade).

The analyses utilized data on gender roles and linguistic acculturation measured at Wave 5 and all other variables measured at Wave 6. Because gender roles were not measured until Wave 5, the decision to use data from Wave 6 for the mediators was made to ensure that the measurement of the exogenous variable, gender roles, preceded the measurement of the predicted mediators. There were 1,874 participants in Wave 5, 1,401 participants in Wave 6, with a total of 1240 participants having data in both Waves 5 and 6. Of these participants, 955 (450 boys, 505 girls; 77% of participants with data in both Waves 5 and 6) were of Mexican, Mexican American, or other Latino ethnicity. Of these 955 participants, 227 were first generation immigrants, with both parents being foreign born, while 505 were second generation, where at least one parent was U.S. born. Only data from these 955 Latino participants were used for the analyses.

Measures

The reliabilities (Cronbach's alpha) reported below are based on the sample of 955 Mexican-American Wave 5 and 6 participants.

Substance use. Substance use was measured by 5 questions for which students reported the frequency and amount of their use of alcohol, cigarettes, marijuana, or inhalants within the past 30 days, with an additional question for frequency of binge drinking of alcohol ("5 or more drinks within a few hours"). These questions were modeled after those used previously by Flannery et al. (1999) and were chosen for their developmental appropriateness for the age group under study, and their successful use with a Mexican-heritage middle school population (Kulis et al., 2005). For the questions assessing recent frequency of

alcohol, cigarette, marijuana, and inhalant use, the responses were coded uniformly as the number of times these substances were used in the last 30 days: 1 = 0 times, 2 = 1-2, 3 = 3-5, 4 = 6-9, 5 = 10-19, 6 = 20-39, 7 = 40 or more times. Substance use amounts were reported in categories that varied by substance. For amount of alcohol use in the last 30 days, responses were coded 1 = none, 2 = 1 drink, 3 = 2 or 3 drinks, 4 = 4 to 7 drinks, 5 = 8 to 15 drinks, 6 = 16 to 30 drinks, 7 = more than 30 drinks. For last 30 day binge drinking, responses were coded 1 = 0 times, 2 = 1 time, 3 = 2 times, 4 = 3-5 times, 5 = 6 or more times. For last 30 day cigarette use amounts, responses were coded 1 = none, 2 = one puff, 3 = part or all of one cigarette, 4 = 2 or 3 cigarettes, 5 = 4 to 10 cigarettes, 6 = 11 to 20 cigarettes, 7 = more than 20 cigarettes. For last 30 day marijuana amount, responses were coded 1 = none, 2 = 1 hit, 3 = 2 or 3 hits, 4 = 4 to 10 hits, 5 = 11 to 20 hits, 6 = 21 to 40 hits, 7 = more than 40 hits. Due to the wide variety of types of inhalants that are used and lack of standard units of consumption, amounts of inhalant use were not assessed in the questionnaire. A composite scale for alcohol use was created by combining the standardized frequency, amount, and binge drinking measures (Cronbach's $\alpha = .89$). Similar composite cigarette and marijuana use scales were created by combining standardized frequency and amounts for cigarettes and marijuana separately (correlation between the two items = .87 for cigarettes, .86 for marijuana). These composite scores were computed to produce more reliable and sensitive indices of use for each substance. Given the nature of these variables, even after the resulting composite scales were calculated, the scales were still highly skewed ($\gamma=2.37$,

6.18, and 4.04 for alcohol, cigarettes, and marijuana, respectively) and highly kurtotic ($\kappa=6.11$, 45.42, and 17.10 for alcohol, cigarettes, and marijuana, respectively).

Biological sex. Sex differences were measured by self-report in response to the question “Are you a boy or a girl?” and coded 0=Male, 1=Female.

Adaptive and maladaptive gender roles. Positive and Negative Gender Roles (Antill, Cunningham, Russell, & Thompson, 1981; Marsh & Myers, 1986; Russell & Antill, 1984; Ricciardelli & Williams, 1995) were measured by 12 items assessed only at Wave 5 and responded to on 5-point response scales ranging from 0 = “never” to 4 = “always.”. Three adaptive masculinity items measured “assertive masculinity” that captures a sense of self confidence, assertiveness, and goal orientation ($\alpha = .72$): “When I’m with my friends, I am a good leader;” “I express my opinion even when others disagree;” and “I have clear goals for myself.” Three items measured maladaptive masculinity, or “aggressive masculinity,” indicating dominance and control over others ($\alpha = .67$): “I am rude to others;” “I am an aggressive person;” and “I ignore rules that get in my way.” “Affective femininity” included three items that measured nurturing, empathetic, and expressive aspects of femininity ($\alpha = .74$): “I am a sweet person;” “I really want to know how others are feeling;” and “When someone feels bad, I try to make them feel better.” In contrast, the last three items measuring maladaptive aspects of femininity, or “submissive femininity,” tapped a sense of dependence and inadequacy ($\alpha = .40$): “When someone pressures me to do something, I just give in;” “I have trouble making decisions;” and “I spend time

worrying about things.” The low alpha is due to the small number of items and the relatively low correlations among the items, but all inter-item correlations are positive and range from .14 to .21, and all items have standard deviations above 1.0. Moreover, the scale is positively correlated with the mediating variables for girls, which provides a rationale for including it in the analyses. Therefore, it was decided to retain the measure. The three other Wave 5 measures of gender roles have adequate reliability ($\alpha = .67, .72, .74$).

Antisociality. Antisociality was measured by six items at Wave 6 (parentheses are the percentage of the sample reporting ever engaging in the behavior), getting into fights (35%), taking dares (32%), skipping school (17%), carrying a weapon (19%), hurting an animal (11%), and stealing (26%). These “risk behavior” items were drawn from a variety of instruments covering risk and pro-social behaviors, including the Youth Risk Behavior Survey (Centers for Disease Control and Prevention, 2006) and Hawkins, Catalano, and Miller’s (1992) instrument. Cronbach’s alpha for the 6 items is .82. This scale is intended as a proxy for externalizing behaviors.

Depressive symptoms. Depressive symptoms were measured by a single Wave 6 item about the frequency of feeling sad (67% of the sample reported at least one occurrence of this). This item is intended as a proxy for internalizing behaviors. It is true that depressive symptoms are assessed with a single item; however, this does not mean it is an unreliable measure; it only means that its reliability cannot be assessed statistically.

Adaptive coping. Positive, adaptive coping was based on three Wave 6 decision-making items (Botvin, Griffin, Diaz, & Iffil-Willimas, 2001; Epstein, Griffin, & Botvin, 2002) originally derived from the Coping Assessment Battery (Bugen & Hawkins, 1981): solving problems by getting information to make the best choice, looking for different ways to solve the problem, and thinking about what will happen for each choice before doing anything ($\alpha = .81$).

Avoidant coping. Negative, avoidant coping was based on three Wave 6 decision making items (Botvin, Griffin, Diaz, & Iffil-Willimas, 2001; Epstein, Griffin, & Botvin, 2002): solving problems by letting someone else decide for the person, just letting it happen, and doing what everyone else is doing ($\alpha = .70$).

Although the decision making scales are not explicitly about adaptive vs. maladaptive coping, they capture aspects of the active vs. avoidant coping studied by Broderick and Korteland (2002) and Lengua and Stormshak (2000). It should also be noted that the 6-item decision making scale of Botvin et al. (2001) and Epstein et al. (2002), was meant to assess a single dimension of applied information gathering strategies, but as can be seen in Table 3, the reverse-scored items which make up the Avoidant Coping scales, are largely uncorrelated with the Adaptive Coping scale.

Acculturation. The linguistic acculturation scale (Marin et al., 1987) was adapted from The Short Acculturation Scale for Hispanics (SASH). The original scale included 12 items related to three factors: (a) "Language Use," (b) "Media," and (c) "Ethnic Social Relations." This study utilized only three of the SASH items asking about the degree to which English or Spanish is used with family,

friends, and media ($\alpha = .72$ in the current study sample). The three items ask what language is usually used “when talking with family members,” “when talking with friends,” and “when you watch TV, listen to the radio or listen to music.” Response options are: 1 = “Spanish only”, 2 = “mostly Spanish,” 3 = “both English and Spanish,” 4 = “mostly English,” 5 = “English only.”

Control variables. Age, school grades (coded 1 = “mostly F’s” to 9 = “mostly A’s”), whether the student came from a two-parent family (coded 0 = “other family type” vs. 1 = “2 parent family”), and whether the student was receiving the Federal school lunch program (coded 1 = “free lunch”, 2 = “reduced lunch”, and 3 = “neither”). School lunch participation, based on family income, provided a more reliable proxy measure for SES than students’ imprecise knowledge of parental education or income levels. These variables are typically associated with risk for substance use and have been controlled for in previous studies with the DRS4 data set (Kulis et al., in press). Since the *keepin’ it REAL* intervention was meant to reduce substance use, treatment group was a dummy coded control variable, with those not receiving the *keepin’ it REAL* intervention coded 0 and those receiving the version of the intervention in any grade coded 1.

Analyses

Path Analyses. Before conducting the path analyses, the control variables—age, school grades, two-parent family, school lunch, and treatment—were partialled out of each of the three composite substance use dependent variables (alcohol, cigarettes, and marijuana) through multiple regression procedures. The standardized residuals for these composite substance use

dependent variables were computed for each participant and used for the path analyses of these dependent variables.

A multiple mediator path analysis was undertaken in which all paths from linguistic acculturation and specific gender roles to substance use were specified as mediated by each of the four mediators, antisociality, depressive symptoms, adaptive coping, and avoidant coping (Figures 2 and 3). All of the direct paths (Hypothesis 1) from linguistic acculturation and positive and negative gender roles to substance use were tested for significance, as well as all of the specific indirect, mediated paths, separately by gender (Hypotheses 2 and 3). More specifically, a multiple mediator path analysis model was estimated using Version 5.21 of the Mplus program (Muthén & Muthén, 1998-2007) with ordinary least squares estimation, using the covariance matrix. Mediation effects were tested using the bias corrected bootstrapping of confidence intervals option in Mplus version 5. Bootstrapping yields asymmetric confidence limits, which are more accurate given that the mediated effects may not have normal distributions (Mackinnon, 2008).

The moderating effect of gender on the direct and indirect paths from linguistic acculturation and gender roles to substance use were tested by estimating the model in Figures 2 and 3 (linguistic acculturation is not included in these figures, but also was tested for direct and indirect effects on substance use) without the interaction terms (i.e., testing a main effects model) separately by gender and then testing the equality of the paths across gender using multi-group path analysis modeling procedures. The Mplus program allowed for the

estimation of separate models for males and females and then constraining all of the pathways to be equal across groups. Significant moderation of all direct and all mediated pathways (antisociality, depressive symptoms, adaptive coping, and avoidant coping) by gender is indicated by a significant chi-square difference test.

The moderating effects of acculturation on the gender roles-substance use relationships (Hypotheses 4 and 5) were tested by additional analyses that included the four interaction terms (each centered gender role multiplied by centered linguistic acculturation) into the above path analyses used to assess mediation, as discussed in MacKinnon (2008). The significance of the estimated regression coefficients of these interaction terms will provide tests of the moderating effects of acculturation (a continuous moderator) on the various direct (Hypothesis 1 – gender roles to substance use) and indirect effects of interest (Hypothesis 3 – gender roles through mediators to substance use).

Power. The sample size of 450 boys and 505 girls provided sufficient power to detect small correlational and partial correlational effects, even when stratifying by gender. For example, with a sample size of 450, there is .80 power to detect a beta of .13 for a linear regression model with 6 predictors (e.g., one gender role and all five mediators) (Lenth, 2006). In terms of testing for mediation, Fritz and MacKinnon (2007) provide sample size guidelines with regard to testing the mediated indirect paths. For two small paths (beta = .14), the sample size required for .80 power is 462, using bias-corrected bootstrapping of the confidence intervals.

Missing Data. Missing data were handled using full information

maximum likelihood estimation. Savalei and Bentler (2005) argue that direct maximum likelihood estimation of missing data is in general less biased than alternative procedures involving pairwise maximum likelihood estimation for incomplete non-normal data, assuming that data are missing at random. This latter assumption, however, may be problematic for the present data, since data are more likely to be missing for adolescents with greater behavioral problems.. Listwise deletion of missing data would greatly reduce the sample size and possibly also attenuate the external validity of the findings by possibly systematically deleting participants most at risk for behavioral problems. Pairwise deletion of missing data could compromise the internal validity of the findings by including covariances for the path analyses based on systematically different subsets of participants. The decision to use maximum likelihood data imputation was thus based on using the maximum amount of information in the data matrices to preserve the sample size for statistical power reasons, while recognizing the inability to completely resolve issues of systematically missing data.

In terms of the amount of missing data, the most problematic variable was antisociality, where as much as 19 percent of the data was missing in correlations with other variables for boys and 12 percent missing for girls. Frequencies of missing data on the antisociality and depressive symptoms items (Items 77a through 77g on the questionnaire) may have been due to participants not finishing the questionnaires, as indicated by the consistent percentages of missing data across the items and the greater percentages of missing data for items that came

later in the questionnaire (Items 78 through last item 87). For the other variables in the path analyses, no more than 8 percent of the data was missing in correlations among these variables.

Results

The results section begins by presenting means, standard deviations, and zero-order correlations among the study variables separately by sex. Discussion of these findings proceeds by first considering the relationships of gender roles with substance use (Hypothesis 1) and the relationships of gender roles with the functional mediators (Hypothesis 2). The path analysis results that follow take into account the multicollinearity among the variables. These results are presented in the order 1) the relationships of gender roles with substance use (Hypothesis 1), 2) the relationships of gender roles with the functional mediators based on the Functional Model of Gender Roles (Hypothesis 2), 3) the mediated pathways from gender roles through the functional mediators to substance use (Hypothesis 3), and 4) the effects of linguistic acculturation in moderating the relationships found in the previous steps (Hypotheses 4 and 5).

The DRS4 data set is a multilevel one in that subject recruitment and study interventions were done at the school level. Nevertheless, the intraclass *rs* of school-level effects for the substance use composites were low (.0204 for alcohol, .0094 for cigarettes, .0289 for marijuana), obviating the need for hierarchical linear modeling procedures for the present analyses.

Over half of the sample (boys 51.3%, girls 58.4%; $\chi^2 = 4.82$, $p < .05$) reported having used (Y/N) alcohol sometime during their lifetime, with lower lifetime use of cigarettes (boys 18.0%, girls 14.9%; $\chi^2 = 1.73$, n.s.) and marijuana (boys 23.6%, girls 18.8%; $\chi^2 = 3.22$, n.s.). In the last 30 days, 31.4% of the sample reported having used alcohol, 39.4% reported having at least one drink,

and 20.5% reported having drunk 5 or more alcoholic drinks on at least one occasion. For cigarette use, past 30 day smoking on at least one occasion was reported by 6.7% of the sample, with 8.4% reporting having taken at least one puff. For marijuana use, past 30 day use on at least one occasion was reported by 11.8% of the sample, with 13.5% reporting having taken at least one hit. Based on chi-square tests of the cross-tabulations of responses across the 7 categories of the past 30-day substance use items across sex, none of these substance use quantity/ frequency variables significantly differed by sex.

Table 1 presents the means and standard deviations for the control, linguistic acculturation, gender roles, mediator, and drug use composite variables separately by sex, with mean sex differences assessed through *t*-tests. Boys were significantly older (although the difference of 0.11 years is substantively trivial) and scored higher on antisociality and avoidant coping than girls. Girls scored significantly higher than boys on grades in school, assertive masculinity, affective and submissive femininity, depressive symptoms, and adaptive coping.

Table 2 presents the intercorrelations among the linguistic acculturation, gender roles, and mediator variables separately by sex. It is interesting that greater acculturation was correlated with greater assertive masculinity for boys, but greater aggressive masculinity and depressive symptoms for girls. For boys, all of the gender roles were positively correlated, but aggressive masculinity was negatively correlated with assertive masculinity and affective femininity for girls.

As predicted from the Functional Model of gender roles (Spence, 1984; Hypothesis 2), for both boys and girls, aggressive masculinity was positively

correlated with antisociality, while affective femininity was negatively correlated with antisociality. Also consistent with the Functional Model, for both boys and girls assertive masculinity and affective femininity were positively correlated with adaptive coping, while aggressive masculinity was negatively correlated with adaptive coping. Not predicted by Hypothesis 2, the reverse pattern was found for avoidant coping: assertive masculinity and affective femininity (same direction but n.s. for boys) was negatively correlated, while aggressive masculinity was positively correlated with avoidant coping. As predicted from the Functional Model, submissive femininity was positively correlated with negative, avoidant coping, although the correlation was only significant for girls. The Functional Model was only partially validated for depressive symptoms with submissive femininity being positively correlated with depressive symptoms just for girls. Not predicted by Hypothesis 2, assertive and aggressive masculinity were both positively correlated with depressive symptoms for boys. Another finding not consistent with Hypothesis 2 was the significant positive correlation of aggressive masculinity with depressive symptoms just for girls.

Table 3 presents the correlations of the linguistic acculturation, gender roles, and mediator variables with the three substance use composites separately by sex. As predicted (Hypothesis 1), for both boys and girls, aggressive masculinity was positively correlated with substance use. Affective femininity, however, was only negatively correlated with cigarette use for boys and alcohol use for girls, while assertive masculinity was not significantly correlated with

substance use for boys or girls. Submissive femininity was negatively correlated with cigarette use just for boys.

In terms of the mediators, as predicted from the Functional Model of Gender Roles, for both boys and girls, antisociality and depressive symptoms were positively correlated with substance use, while positive, adaptive coping was negatively correlated with substance use. These effects were much more consistent for boys than for girls. Negative, avoidant coping was not significantly correlated with the substance use measures.

Figures 5 through 10 show the results of the path analyses for the main effects model for each substance use composite as the dependent variable. The control variables, treatment, grades, age, two parent, and school lunch, were partialled out of these composite scores prior to the path analyses. For simplicity, only the significant pathways (standardized coefficients) among the predictors, mediators, and drug use dependent variables are shown. Pathways from linguistic acculturation are not shown, as none of these was significant, either as direct or indirect effects on substance use. Correlations among the predictors and among the mediators are not shown. For boys, the R^2 s for alcohol, cigarette, and marijuana use were .154, .182, and .230, respectively. For girls, the R^2 s for alcohol, cigarette, and marijuana use were .094, .046, and .130, respectively.

Moderating Effect of Sex

Difference chi-squares for models constraining the pathways to be the same for males and females were all highly significant (alcohol $\Delta\chi^2 = 138.971$, 45 d.f., $p < .001$; cigarette $\Delta\chi^2 = 142.357$, 45 d.f., $p < .001$; marijuana $\Delta\chi^2 = 136.853$,

45 d.f., $p < .001$), indicating that at least one of these pathways was different for males vs. females. Sex is thus a significant moderator of the direct and mediated pathways from gender roles to drug use.. Results are thus presented separately for boys and girls.

Pathways from Gender Roles to Mediators: Tests of the Functional Model of Gender Roles

For boys (Figures 5, 6, and 7), the pathways generally remained consistent with the Functional Model (Hypothesis 2), as was found with the correlational analyses (Table 2). Some partial correlation pathways between the gender roles and the mediators were no longer statistically significant, presumably due to the intercorrelations among the gender roles. Aggressive masculinity continued to positively predict antisociality, while aggressive masculinity negatively predicted adaptive coping. Consistent with Huselid and Cooper (1994) and Hoffman et al. (2004), affective femininity was negatively predictive of antisociality. Also consistent with the functional model, submissive femininity was positively correlated with avoidant coping. What was surprising (in contrast to Hypothesis 2) was that none of the gender roles significantly predicted depressive symptoms, in contrast with the correlations in Table 2. This may be due to the correlations among some of the gender role predictors, with the shared effects of the gender roles on the mediators and the dependent variables resulting in particular paths being attenuated.

For girls (Figures 8, 9, and 10), aggressive masculinity positively predicted antisociality, while affective femininity negatively predicted

antisociality. These pathways from gender roles to the mediators were consistent with the Functional Model (Hypothesis 2). Also consistent with the Functional Model, submissive femininity positively predicted both depressive symptoms and avoidant coping. In contrast to the results for boys, for girls, assertive masculinity negatively predicted avoidant coping, while aggressive masculinity positively predicted depressive symptoms just for girls. This finding for girls was not consistent with Hypothesis 2.

Pathways from Gender Roles to Drug Use: Direct Paths

For boys, there were significant direct paths from aggressive masculinity to drug use across all three substances (Hypothesis 1), which has been found in several previous studies. For girls, the only significant direct path from gender roles to drug use was from aggressive masculinity to marijuana use. What is interesting here is that all other gender role effects on drug use and some of the effects of aggressive masculinity on drug use are significantly mediated by other variables.

Pathways from Mediators to Drug Use

Considering each of the four mediators in turn, for both boys and girls, as expected, antisociality significantly positively predicted drug use (with the exception of girls' cigarette use), even after controlling for the effects of gender roles. While in Table 3, depressive symptoms were significantly correlated with substance use for boys, in the path analyses depressive symptoms only predicted marijuana use for boys. For girls, positive, adaptive coping significantly negatively predicted alcohol use, but not cigarette or marijuana use. In contrast to

the zero-order correlations reported in Table 3, for the path analyses, once gender role effects were controlled for in the path analysis, positive, adaptive coping no longer significantly negatively predict substance use for boys. On the other hand, avoidant coping did predict drug use for boys for all three substances, with depressive symptoms also predicting marijuana use. What is interesting is that these pathways are negative, instead of the expected positive effects. In the correlational matrix (Table 3), it should be noted that avoidant coping was not significantly correlated with substance use, so these significant avoidant coping-substance use relationships for boys suggest that suppressor effects were occurring in the multivariate analyses. These suppressor effects are noted in the discussion.

Indirect, Mediated Pathways from Gender Roles to Drug Use

In the discussions of the indirect, mediated pathways, it should be noted that these paths can be statistically significant, even if one of the component paths is not significant, since the standard error for the indirect path is based on the product of the standard errors for the component paths. All of the significant mediated effects, as well as the paths for these effects from the gender roles to the mediators and the mediators to substance use, are listed in Tables 4 and 5 (all of the tested mediated effects are listed in the Appendix). For boys, as hypothesized, antisociality significantly mediated the pathways from assertive masculinity (95% confidence interval: alcohol .002, .127; cigarettes .001, .151; marijuana non-significant), affective femininity (95% CI: alcohol -.147, -.007; cigarettes -.158, -.008; marijuana -.177, -.007), and aggressive masculinity (95% CI: alcohol .037,

.277; cigarettes .021, .318; marijuana .059, .353) to drug use (Hypothesis 3). In all these cases, assertive and aggressive masculinity were positively predictive of antisociality, while affective femininity was negatively predictive of antisociality. In turn, antisociality was positively predictive of substance use.

Another finding was that negative, avoidant coping mediated the pathways from assertive masculinity (95% CI: alcohol .001, .127; cigarettes .001, .057; marijuana .001, .048) and submissive femininity (95% CI: alcohol -.077, -.003; cigarettes -.094, -.004; marijuana -.075, -.004) to drug use. In these instances, assertive masculinity was negatively predictive of avoidant coping, but submissive femininity was positively predictive of avoidant coping. The anomalous finding was that avoidant coping was then significantly negatively related to substance use. For marijuana use, there was another significant mediated pathway from aggressive masculinity through negative, avoidant coping (95% CI: -.060, -.001), with aggressive masculinity being positively correlated with avoidant coping. It should be noted that the non-significant pathway from assertive masculinity to avoidant coping was negative, again suggesting that greater negative femininity was associated with avoidant coping, which in turn possibly resulted in social withdrawal in boys and lower risk for drug use.

Multiple regression analyses predicting the substance use composites from the gender role predictors and functional mediators were conducted to test for significant multicollinearity among the predictors and mediators. All tolerances were found to be at least .5, and all VIFs were below 2.0. There are, however, large correlations among the gender roles, particularly between assertive

masculinity and affective femininity ($r = .66$) for boys. It is possible that these anomalous effects for assertive masculinity and submissive femininity are due to partialling out the effects of the other gender roles. Exploratory path analyses for the main effects model were conducted that dropped adaptive coping, affective femininity, or aggressive masculinity from the model, but these analyses for the most part still left as significant the indirect pathways from assertive masculinity and submissive femininity through avoidant coping to substance use. The one exception was the model dropping affective femininity, where the assertive masculinity through avoidant coping effect was no longer significant. It should be noted that the correlation between assertive masculinity and affective femininity is particularly high for boys in this sample ($r = .66$; Table 2). Assertive masculinity and affective femininity may be inseparable in these boys, a reflection of *caballerismo* (Arciniega et al., 2008). The expected mediated pathways from assertive masculinity and affective femininity through adaptive coping and the expected mediated pathways from submissive femininity through depressive symptoms to substance use were not found for boys.

Similar to the boys, for girls, antisociality significantly mediated the pathways from affective femininity (95% CI: alcohol $-.072, -.004$; cigarettes $-.033, -.002$; marijuana $-.090, -.007$) and aggressive masculinity (95% CI: alcohol $.009, .099$; cigarettes $.003, .050$; marijuana $.010, .120$) to substance use (Hypothesis 3. In these cases, aggressive masculinity was positively predictive of antisociality, while affective femininity was negatively predictive of antisociality. In turn, antisociality was positively predictive of substance use. As hypothesized,

for alcohol and cigarette use, adaptive coping significantly mediated the pathways from affective femininity (95% CI: alcohol -.051, -.001; cigarettes -.052, -.001) and aggressive masculinity (95% CI: alcohol .001, .060; cigarettes .001, .055). In these cases, aggressive masculinity was negatively predictive of adaptive coping, while affective femininity was positively predictive of adaptive coping. In turn, adaptive coping was negatively predictive of substance use. As was the case for boys, the expected mediated pathways from submissive femininity through depressive symptoms to substance use were not found.

Moderating Effects of Linguistic Acculturation on the Gender Role-Drug Use Relationship

Figures 11 through 16 show the results of the path analyses for the full model including the interactions of linguistic acculturation by gender roles for each substance use composite as the dependent variable. Again, only the significant pathways (standardized coefficients) between the predictors, mediators, and drug use dependent variables are shown. Pathways from linguistic acculturation are not shown, as none of these was significant. Correlations among the predictors and among the mediators are also not shown.

Difference chi-squares for models constraining the pathways to be the same for males and females was significant (alcohol $\Delta\chi^2 = 376.506$, 91 d.f., $p < .001$; cigarette $\Delta\chi^2 = 372.899$, 91 d.f., $p < .001$; marijuana $\Delta\chi^2 = 370.699$, 91 d.f., $p < .001$), indicating that these pathways were different for males vs. females. Results are thus presented separately for boys and girls.

For boys (Figures 11, 12, and 13), there was a significant acculturation by affective femininity interaction in predicting drug use, but this effect was significantly mediated by antisociality for alcohol (95% CI: .013, .142; point estimate: .058; $p < .01$), cigarette (95% CI: .010, .146; PE: .056; $p < .01$), and marijuana (95% CI: .026, .181; PE .082; $p < .01$) use. As Figure 17 shows, this interaction was due to affective femininity only having an effect in reducing antisociality for the least acculturated boys.

Figures 11 through 13 also show that there were significant acculturation by affective femininity and acculturation by submissive femininity interaction effects on adaptive coping. As shown in Figure 18, the former interaction is the counterpart for the interaction with antisociality shown in Figure 17. Here, greater affective femininity has a larger relationship (steeper slope) in increasing adaptive coping in boys low in acculturation, again perhaps due to the effects of socialization into gender expectations of *machismo*. Figure 19 shows the interaction of acculturation and submissive femininity on adaptive coping. These findings are hard to explain, as the expected negative relationship between submissive femininity and adaptive coping is only found for boys in the middle range of acculturation. For boys low and high in acculturation, submissive femininity is positively correlated with adaptive coping.

For girls (Figures 14, 15, and 16), the expected acculturation by aggressive masculinity interaction in predicting marijuana use was not found, again perhaps due to the statistical power issues discussed above for boys.

Discussion

Summary

The present findings are consistent with previous research (Kulis et al., 2008, 2010, in press) regarding the relationship of gender roles, especially aggressive masculinity, with substance use in Mexican American adolescents. Consistent with Hypothesis 1, for both boys and girls, aggressive masculinity was positively correlated with alcohol, cigarette, and marijuana use, while affective femininity was negatively correlated with substance use, although this latter effect only reached statistical significance in a couple of instances. Aggressive masculinity was found to have significant direct and indirect effects on substance use for both boys and girls. Assertive masculinity and submissive femininity have been less consistently found to be correlated with substance use in previous studies of Mexican American adolescents (Kulis et al., 2008, 2010, in press), and for the present analyses, these gender roles were not significantly correlated with substance use, with the exception of affective femininity and cigarette use for boys and affective femininity and alcohol use for girls. The attenuation of the gender role-substance use relationships here might have been partly due to gender roles having been measured a year prior to the measurement of past 30 day substance use.

The overall novelty and importance of these analyses are in demonstrating how the gender role-substance abuse relationships can be understood within a Functional Model (Spence, 1984) of gender roles that links positive and negative aspects of gender roles to psychological and social functioning. Hypothesis 2

proposed several links, based on the Functional Model, from assertive and aggressive masculinity and affective and submissive femininity to measures of adaptive and maladaptive social and psychological functioning, including antisociality, depressive symptoms, adaptive coping, and avoidant coping. For the most part, the predictions for Hypothesis 2 were confirmed. For both boys and girls, assertive masculinity was positively predictive of positive, adaptive coping, affective femininity was positively predictive of adaptive coping, and aggressive masculinity was positively predictive of antisociality. There is, however, a notable sex difference for the latter correlation, as the aggressive masculinity-antisociality correlation was considerably higher for boys than for girls ($r = .33$ vs. $r = .17$, respectively; Table 2). In addition, affective femininity was negatively predictive of antisociality. Consistent with predictions for Hypothesis 2, submissive femininity was positively predictive of depressive symptoms and avoidant coping, but this is the case only for girls. Among girls, submissive femininity was also positively predictive of antisociality (correlations in Table 2). For boys, depressive symptoms were correlated with both assertive and aggressive masculinity. What was surprising and different from the results for boys was that, just for girls, assertive masculinity negatively predicted avoidant coping, while aggressive masculinity positively predicted depressive symptoms just for girls. This latter finding is consistent with the findings from Kulis et al. (2010) suggesting that aggressive masculinity is associated with psychopathology in Mexican American girls. These latter sex differences suggest that there are some ways in which gender socialization may work differently for Mexican

American adolescent boys vs. girls, which was also borne out in the path analyses predicting substance use.

The path analyses (Hypothesis 3) showed how the manifestations of these gender roles in psychological functioning, particularly antisociality, can account for the relationships of gender roles with alcohol use. For both boys and girls, lower affective femininity and greater aggressive masculinity were predictive of greater substance use through the effects of these gender roles on antisociality. Greater affective femininity was associated with lower antisociality, while greater aggressive masculinity was associated with greater antisociality. These were the significant mediated effects that yielded the largest coefficients for the indirect pathways in the present analyses, particularly for boys. The aggressive masculinity-antisociality effect may be related to the findings of the study by Kulis, Marsiglia, and Hecht (2002), which found in a sample of mostly Mexican American adolescents that a measure of masculine dominance was predictive of drug use and drug offers, particularly for boys. Kulis et al. argue that the dominant masculinity measure was related to power and risk taking related to proving maturity, defiance, and authority to their peers through using drugs. There seemed to be connections between gender, gender roles, peer relationships, and substance use, and the researchers propose that defiance of authority, engaging in illegal activity, and experimenting with drugs may not be individualistic behaviors but rather may be a part of a rite of passage that brings acceptance into the group. Several theoretical frameworks, such as Problem

Behavior Theory (Jessor & Jessor, 1975), note the importance of deviant peers in the development of antisocial behaviors in adolescence.

The aggressive masculinity effect on antisociality and substance use was consistent with previous research (Timmermans, van Lier, & Koot, 2008) that links aggressiveness, antisociality, and subsequent increased substance use. Interventions to reduce antisociality would undoubtedly also have salutary effects in reducing substance use. The two gender roles most predictive of antisociality and substance use are aggressive masculinity and affective femininity, suggesting that these gender roles would be promising targets for intervention. There are problems, however, in targeting aggressive masculinity. Based on the Functional Model of gender roles (Spence, 1984) and conceptions of negative, aggressive masculinity as the maladaptive, extreme manifestations of instrumentality (Marsh & Myers, 1986; Ricciardelli & Williams, 1995; Russell & Antill, 1984), focusing on the socialization of more adaptive masculine/instrumental gender role identifications and behaviors in adolescents may not necessarily prevent the development of antisocial coping behaviors. This is apparent in the present analyses, where for Mexican American adolescent boys, assertive masculinity was positively predictive of antisociality, and the mediated pathways from assertive masculinity through antisociality to substance use were significant. It may be difficult to disentangle the positive and negative aspects of instrumentality/masculinity, particularly when cultural traditions like *machismo* are perceived by adolescents as encouraging these negative aspects.

The affective femininity effect on antisociality and substance use, however, not only demonstrated the utility of the Functional Model of gender roles (Spence, 1984), but suggests that the feminine, expressive strategy can be adaptive in obviating the need for problematic externalizing/antisocial behaviors. If this finding is replicable, it suggests a promising target for interventions to reduce substance use in Mexican American adolescents. As discussed below, affective femininity is also predictive of adaptive coping (Table 2) that is associated with a reduced risk for alcohol and cigarette use, at least for girls. While the size of the path coefficients going from affective femininity through adaptive coping to substance use are less than those going through antisociality for boys, this should not be surprising. The links between coping behaviors and substance use are more indirect, compared to those between antisociality and substance use, i.e., while individual differences in levels of adaptive and maladaptive coping have general effects across a wide range of social and psychological functioning, including antisociality, antisociality itself is a specific risk factor for substance use, and substance use in adolescents is often a criterion for antisociality (e.g., the externalizing psychopathology items in the Child Behavior Check List (Achenbach & Edelbrock, 1983)).

Such a “feminine” coping approach that works for boys as well as girls supports the results of studies suggesting that adolescents who manifest androgynous gender roles tend to have the highest levels of social and psychological adjustment (Steenbarger & Greenburg, 1990; Wells, 1980). Socializing boys for positive aspects of both masculine and feminine gender roles,

with a particular emphasis on affective femininity, would seem to hold promise as an intervention for better psychological adjustment, but the present findings suggest that such gender role interventions may have their salutary effects for boys through decreasing the propensity for antisociality. This approach may be particularly promising for Mexican American adolescent boys, where such gender role socialization may be coupled with traditions of *caballerismo* that also promote prosocial/pro-family behaviors (Arciniega et al., 2008).

It is noteworthy that, while adaptive coping did not significantly mediate the gender roles-alcohol use relationship for boys, adaptive coping did significantly mediate the relationships between affective femininity and aggressive masculinity to alcohol and cigarette use for girls. This mediated pathway was significant, in spite of the more inconsistent relationships of adaptive coping with substance use, as compared to antisociality. In fact, for girls, the indirect path coefficients going from affective femininity and aggressive masculinity to adaptive coping were notably larger than those going from these gender roles to antisociality. The somewhat larger indirect effects of gender roles on substance use through antisociality compared to adaptive coping were due to the stronger relationships of antisociality with substance use (Table 5), but as noted above, such a stronger, specific relationship of antisociality with substance use is expected. Adaptive coping was significantly negatively correlated with antisociality (Table 2), and the gender role pathways to such coping were opposite to those for antisociality (e.g., affective femininity was negatively related to antisociality but positively related to adaptive coping).

To the extent that these findings on gender roles and adaptive coping in girls are replicable, the findings suggest that interventions focused on improving coping skills to reduce substance use in Mexican American girls (Epstein et al., 2002) may benefit from also targeting positive gender roles, particularly affective femininity. Interventions to improve coping skills through the socialization of positive aspects of both masculine and feminine gender roles, perhaps with a particular emphasis on assertive masculinity here, may hold promise as an intervention for better psychological adjustment in adolescent girls. Freshman and Leinwand (2000), in fact, specifically recommend the teaching of active coping skills consistent with assertive masculinity to prevent substance use in adolescent girls. The “Go Grrrls” curriculum (LeCroy & Daley, 2001; LeCroy, 2005), in turn, suggests that adolescent girls’ psychological adjustment can be enhanced by programs that emphasize the positive aspects of female gender roles.

The significant mediated pathways involving assertive masculinity, submissive femininity, avoidant coping, and lower alcohol use were not predicted by Hypothesis 3. One interpretation of the mediated pathways from assertive masculinity (negative) and submissive femininity (positive) through avoidant coping to substance use is that on the opposite end of the spectrum from the aggressively masculine, alcohol- and substance-using boys are boys who are low in masculinity and socially withdrawn. Such social withdrawal may decrease the likelihood of these boys associating with alcohol-using, antisocial peers, cause such peers to reject them, and decrease these boys’ access to illegal drugs. While the zero-order correlation (Table 3) of avoidant coping with substance use was

essentially zero, the partial correlations shown in the path analyses are significantly negative, suggesting a suppressor effect of gender roles on the avoidant coping-substance use relationship.

As Vigoya (2001) summarizes, in Latin America, femininity and passivity in men are typically associated with homosexuality, although such passivity may extend to any sexual relations. There is little research on the psychological functioning of such low masculine Mexican American boys, and future research needs to consider possible long-term negative psychological outcomes for such boys. It should also be noted that this effect is not likely to be replicated, given that it results from a suppressor effect in which the otherwise zero relationship of negative, avoidant coping with substance use for boys became negative, once significant gender role effects on avoidant coping were partialled out. As discussed below, however, there also needs to be a more nuanced understanding of *machismo* in the context of factors such as social class, urban vs. rural settings, and acculturation.

Consistent with Kulis et al. (in press) and Hypothesis 4, the present findings confirmed that greater affective femininity was predictive of lower alcohol use only for Mexican American boys low in acculturation. This effect was completely mediated by antisociality. One explanation is that low acculturated boys have been socialized into the traditional gender role of *machismo*, where femininity is associated with weakness, while the more aggressive aspects of masculinity are associated with strength and respect. While greater acculturation is typically associated with greater alcohol use (Epstein et

al., 2001), this view would suggest that adherence to traditional gender roles appears to be a particular risk factor for problem behaviors for low acculturated Mexican American boys. An alternative explanation, however, is that adherence to traditional Mexican gender roles in low acculturated boys may reflect socialization into the gender role of *caballerismo* (Arciniega et al., 2008), where greater affective femininity is part of being responsible for one's family and respectful of women, leading to lower antisociality. Yet a third explanation for this interaction is that more bicultural Mexican American boys may be more able to switch between the gender role expectations of Mexican vs. U.S. culture and that acculturation needs to be understood from a bidimensional perspective (Berry, 2006). Level of acculturation clearly needs to be taken into account for intervention programs targeting gender roles to reduce substance use in this population. Kulis et al. (in press), also found significant linguistic acculturation interactions with assertive and aggressive masculinity in predicting substance use, which were not found in the present analyses. The one year gap between the Wave 5 measurement of linguistic acculturation and gender roles vs. the Wave 6 measurement of substance use again may have attenuated both acculturation and gender role effects.

Contrary to the findings of Kulis et al. (in press) and of Hypotheses 5, linguistic acculturation did not moderate the effects of gender roles on substance use for adolescent Mexican American girls. The present findings are also not consistent with the idea that Mexican American girls, compared to boys, are more impacted in their psychological functioning and substance use by acculturation

(Kranau et al., 1982). Kulis et al. (in press) had found that aggressive masculinity was particularly predictive of greater marijuana use for girls who were highest on linguistic acculturation. This was interpreted in terms of the effects of the loss of traditional values of *marianismo*, as well as possible increased externalizing and internalizing psychopathology associated with girls adopting such negative masculine gender roles (Kulis et al., 2010). The lack of significant acculturation by gender role interactions in the present analyses may again be due to the one year gap between acculturation and gender role vs. substance use measurements. There may also be issues in the conceptualization and measurement of acculturation, such as the need to consider a more multidimensional approach.

In contrast to previous studies (e.g., Marsiglia et al., 2010), the present analyses did not yield any significant main effects of linguistic acculturation in predicting substance use in Mexican American adolescents. One possible explanation may be that such acculturation effects are attenuated in ethnic enclaves where native cultural traditions are more likely to be maintained and where acculturation effects mostly work through family processes (Marsiglia, Nagoshi, Parsai, & Castro, in press; Nagoshi, Marsiglia, Parsai, & Castro, in press). An alternative explanation is that, by combining family, friends', and media language use into a single composite measure of linguistic acculturation, more sensitive effects coming from, perhaps, friends' language use may have been obscured.

The present findings do argue for the need to consider the effects of acculturation on Mexican American adolescents' psychological adjustment in the

context of gender roles and vice versa. Consistent with this idea, Cespedes and Huey (2008) found that perceived parent-youth gender role gaps, but not parent-youth acculturation gaps, were predictive of greater depression in adolescent Mexican American girls, but not boys.

Moving Toward Acculturation as a Multiple Identity Process

Acculturation entails the social and psychological exchanges that take place when there is continuous contact and interaction between individuals from different cultures (Berry, 1997). These changes can be observed across a number of different domains, such as attitudes, values, behaviors, and sense of cultural identity (Cuéllar, Arnold, & Maldonado, 1995). While linguistic acculturation was used in the present study, it is really a proxy for a more multidimensional acculturation construct. Alternative bidimensional and multidimensional approaches may have provided more nuanced findings, but the present findings of interactive effects among gender, gender roles, and linguistic acculturation suggest the need for approaches that consider acculturation in terms of an identity process (Berry, 2006; Schwartz, Montgomery, & Briones, 2006) and in terms of multiple intersecting social identities (Shields, 2008), such as gender vs. ethnic identity.

Schwartz et al.'s (2006) *identity theory* of acculturation defines adaptive identity in terms of a coherent personal identity that signifies an internally consistent set of goals values and beliefs and in terms of an internally consistent but workable, flexible social (including cultural) identity that generates positive feelings about the groups to which one perceives oneself belonging. This then

leads to the proposal that (a) social and cultural identity underlies acculturation and that (b) personal identity can help to ‘anchor’ the immigrant person during cultural transition and adaptation. For example, “*familismo*,” which consists of a strong sense of obligation toward helping family members, a reliance on support from family members, and the use of family members as behavioral attitudinal referents, is acknowledged as a core value for Mexicans and may influence their parenting practices. Similarly, acculturation, as an index of the degree to which individuals prefer Mexican versus American values and ways of life, has strong relations with individual adaptation and family practices.

Berry (2006) also proposes an identity theory of acculturation, noting that one approach to understanding how immigrants come to live within and between the two societies is through the lens of their cultural identity. Immigrants come to the new country with a clear sense of their identity from their native culture. As they learn the language and become citizens of the new country, they begin to identify with the new culture in various degrees. If they have the ability to become citizens, then the identification can be strengthened. Their sense of group membership changes, as they see themselves as being part of an “ethnocultural” group. They may see themselves as part of two cultures, their ethnic and national culture. There are three factors (voluntariness of contact, mobility, and permanence) that vary the acculturation experience. Age at time of migration, the length of time since migration, and the developmental tasks the adolescent is working with are all important factors that affect a positive migration process.

Schwartz et al. (2010) argue for the need to comprehensively understand acculturation across several functional levels, including identifications, values, and practices, as well as how these processes are affected by stage of social/psychological development, motivations for migration, concealability of immigrant status, residence in ethnic enclaves, and the kinds of reception experiences that the immigrant receives from the host culture. The unidimensional linguistic acculturation measure used in the present research may have been inadequate to capture all of the relevant ways that acculturation interacts with gender roles to affect social and psychological functioning and consequent substance use. For example, Schwartz et al.'s (2006, 2010) and Berry's (2006) conceptualizations of acculturation as an identity are consistent with research that shows how ethnic identification may moderate other influences on adolescent development, such as parental monitoring, in different ways than linguistic acculturation (e.g., Nagoshi, Marsiglia, Parsai, & Castro, in press).

An important theme that emerges from the present research is that acculturation also needs to be understood in the context of other intersecting social identities (Shields, 2008), such as gender, race/ethnicity, and social class. For example, Schwartz et al. (2010) note the importance of how not being able to conceal one's membership in a group results in more salient reactions from members of the dominant culture to enforce one's identity and expected behaviors in the group. In contrast, the significance of the motivations for and voluntariness of migration (Berry, 2006; Schwartz et al., 2010) suggest that immigrants may be more or less empowered to self-construct their identities in the new culture.

Schwartz et al.'s (2006, 2010) and Berry's (2006) conceptualizations of acculturation as an identity process suggest the need for both quantitative and qualitative research that looks at intersecting social identities in terms of both the behaviors expected by the dominant culture, based on an individual's societally perceived membership in a group, vs. the individual's own self-construction of their identity (Nagoshi & Brzuzy, 2010). Such an intersectional approach not only will provide a more comprehensive understanding of how membership in any oppressed social group is related to an individual's social and psychological functioning, but will also provide insights on how to empower members of these groups to oppose oppression (Nagoshi & Brzuzy, 2010).

The Intersectionality of Acculturation and Gender Roles

The interactions of intersecting ethnic and gender identity, and perhaps other intersections with unmeasured social class or other identities, appear to be important in increasing or decreasing the likelihood of psychological maladjustment and consequent substance use. The present research highlights the functional links between acculturation and gender roles in determining the psychological functioning of Mexican American adolescents. While these gender role findings have been interpreted in terms of Mexican-heritage youths' transitions through acculturation away from traditional gender roles of *machismo* and *marianismo* to more mainstream American gender role beliefs, the issues of the dynamic intersections of ethnic, gender, and social class identities suggest the need for a more dynamic, contextually-based understanding of these gender roles.

Stevens (1973) was one of the early writers who first formalized the distinction between *machismo* and *marianismo* in Mexican society and discussed their historical and social contextual nuances. She noted how patterns of expectations based on real or imagined attributes of the individual groups who perform certain tasks attain a validity which makes it possible to use these attributes as criteria for value judgments quite unrelated to functional necessity. Machismo was characterized by Stevens as a cult of exaggerated aggressiveness and intransigence in male to male relationships and arrogance and sexual aggression in male to female relationships. *Machismo*, however, was primarily associated with the lower classes. In contrast, as discussed by Guttman (1996), the positive aspects of *machismo*, are associated with the term *hombre*, a man who does not beat his wife, sees to his family responsibilities with honor and dedication, and is helpful in the home. The conceptualization of masculinity in terms of being an *hombre* was primarily associated with the upper classes.

Similarly, Arciniega et al. (2008) conceptualize the positive aspects of masculinity in Mexican culture in terms of *caballerismo*, a term derived from European chivalric ideas of the horseman. Since only the wealthy could own horses, *caballerismo* is associated with land-owning Spanish gentlemen of high station who were masters of estates and/or ranches and abided by a code of chivalry that stressed personal responsibility and respect for women. Arciniega et al. (2008) developed scales of *caballerismo* vs. *machismo*, based on factor analyses of responses by Mexican American men to masculine gender role items and found that *machismo* was associated with lesser education and poorer

psychological functioning and coping skills. Greater adherence to both *caballerismo* and *machismo* was associated with being born in Mexico, but not necessarily with Spanish language preference. Arciniega et al. (2008) suggest that people who were born in Mexico were more embedded within a time-honored code of ethics and social responsibility associated with *caballerismo*. Arciniega et al. (2008) found that more active and effective problem-solving coping was positively related to *caballerismo* but negatively related to traditional *machismo*. In contrast, a more avoidant coping style, that of wishful thinking, was related to traditional *machismo*. As the researchers note, for those endorsing an adherence to *machismo*, this less effective coping style, coupled with a lower awareness of affect, i.e., less of the emotion-focused coping associated with affective femininity, is likely a risk factor for psychological maladjustment. This may be particularly relevant to the present findings that low acculturated Mexican American adolescent boys who were low in affective femininity were higher on antisociality and this, in turn, predicted substance use, whereas this relationship was not found for high acculturated boys.

In turn, Stevens (1973) describes *marianismo* as the cult of feminine spiritual superiority which teaches that women are semi-divine, morally superior, and spiritually stronger than men. It was partially derived from Old World Catholic traditions of the veneration of the Virgin Mary, as well as from secular historical and cultural forces enforcing the social power differentials between the sexes. Latino *mestizo* culture has the notion of the “ideal woman,” the reincarnation of the great mother, submissive to men, but beneath this

submissiveness lies a strength of her conviction that is shared by the entire society. “Men must be humored because they are like little boys, whose intemperance, foolishness, and obstinacy must be forgiven because they can’t help the way they are” (Stevens, 1973, p. 95). This moral burden of women is reflected in their sadness and fatalism, where the deaths of close, particularly male relatives require years of mourning, including denials of happiness and dressing in black. There are notable parallels between these ideas of the moral superiority of women and the ideas of early French feminists who sought to challenge male dominance on the basis of some essential aspect of being female (Hesse-Biber, Gilmartin, & Lydenberg, 1999).

As Stevens (1973) notes, however, the same *mestizo* culture provides an alternate model in the image of the “badwoman” who flaunts customs and persists in enjoying herself. Such a badwoman is not seen as a “real woman,” deviates from prescribed norms, and is divested from characteristically feminine attribute, i.e., becomes somewhat masculine. Meanwhile, “the *marianismo* ideal promotes premarital chastity and postmarital frigidity (i.e., I service my man), but this norm is primarily for the urban middle class, since the poor are expected to just have sex. Nevertheless, this ideal is a security blanket which covers all women, giving them a strong sense of identity and historical continuity” (Stevens, 1973, p. 98).

The above discussion makes clear how the gender role definitions and behaviors associated with *machismo* and *marianismo* are, in fact, partly the products of intersections with poverty and oppressed minority status. It is also interesting that Stevens (1973) notes that female relatives (mothers, aunts, etc.)

are the primary gender role socializers of both boys and girls in traditional families. This has clearly changed in the years since, as more mothers have entered the workforce and extended families have diminished with each succeeding generation in Mexico, with even more profound changes for Mexican families that immigrate to the U.S.

In considering the role of aggressive masculinity in the development of problem behaviors in Mexican American adolescent girls, there may be another example of the intersection of ethnic identity, gender identity, and acculturation. This is the phenomenon of *cholas*. The female counterpart of *cholos*, *cholas* are members of youth gangs built around a strong sense of Mexican ethnic identity. Girls in such gangs have a strong sense of power, status, esteem, and identity, but they also internalize gang values, such as being “bad,” “crazy,” and to be tough, along with drug use as “prize behaviors” (Harris, 1994, p. 291). Such antisocial behaviors often lead to troubles with the law, but confronting the gang’s values will lead to rejection. Many girls join gangs with the need for a sense of belonging, collective identity and support. At the same time, there may be a need for revenge against the dominant culture, the parents, and the violence against themselves and their loved ones (Diego, 2008). These girls’ bonds to their families and schools are weak, and *cholas* are considered to be isolated from the dominant institutions. While these are more aggressive, independent girls, they still allow for male dominance, and the “homeboys” exhibit an attitude of territoriality toward the girls (Harris, 1994). According to Diego (2008), *cholas* are arguably more marginalized than the boys, since in addition to the race and

class obstacles, they also have the threat of gender inequality. These multiple marginalizations are also in the context of a larger cultural value system connected to *mariansimo* and *machismo*, where the female is expected to adhere to a patriarchal society and internalize an “unchallenged feminist identity based, at least in part, on an almost absolute rejection of street life due to enduring pervasive, negative connotations” (Diego, 2008, p. 54). These gangs thus represent a break or resistance against the conservative cultural values of their Mexican families, while on some level facing a more liberal gender norm in America, but at the same time experiencing marginalization from the dominant culture based on racial segregation and discrimination (Klien & Maxson, 2006).

The word *cholas* is considered to be associated with low socioeconomic status, hard living (Bettie, 2000), and a means of effective socialization among low-SES neighborhoods (Diego 2008). With ethnic minorities needing to find employment and a place to live as they immigrate to the U.S., they tend to migrate to poor urban areas with low status occupations (Diego, 2008). This context can affect the family structure and school readiness in the context of language and culture, which can lead to involvement with the legal system. Consistent with the discussion of *cholas*, Kulis et al. (in press) found that it was high acculturated Mexican American adolescent girls, who were also high in aggressive masculinity, who were most likely to engage in marijuana use. Some of these girls might have been *cholas*. While the present analyses did not yield significant linguistic acculturation by aggressive masculinity interactions in predicting antisociality and substance use, as were found by Kulis et al. (in press),

nevertheless the links between aggressive masculinity, antisociality, and substance use in Mexican American adolescent girls were confirmed.

A third example of the intersection of ethnic identity, gender identity, and acculturation involves how globalization, consumerism, migration, and economic hardships have affected the beliefs of *familismo* and traditional gender roles of *machismo* and *marianismo*, which may influence substance-use behaviors and attitudes in Mexico (Marsiglia, Kulis, Rodriguez, Becerra, & Castillo, 2009).

Women are entering the workforce in larger numbers, continuing their education beyond the primary school level more often and are obtaining more educational and vocational degrees (Medina-Mora et al., 2001). Younger generations and those with a higher education status are less likely to hold traditional, binary gender role expectations. These advances have helped to equalize gender role expectations and require an ongoing examination of *familismo* (Marsiglia et al., 2009) and *marianismo/machismo* (Stevens, 1973) as a dynamic phenomenon producing ever-changing protective and risk effects on male and female adolescent substance use attitudes and behaviors. It should be noted though that, despite these advances by women in Mexico and the United States, many individuals continue to follow these strict traditional gender role expectations that deprive some women of social advancement opportunities (Ariza & Oliveira, 2001; Jelin, 2005; Rocha- Sanchez & Diaz-Loving, 2005).

Immigration and economic circumstance can also play a role in the adherence to traditional gender roles. Broughton's (2008) examination of how low-income Mexican men from rural areas negotiate "hegemonic masculinities"

relating to family, work and place in the face of intense pressure to migrate identified three masculine stances—“traditionalist,” “adventurer,” and “breadwinner”—and their associated gendered rationales as these men adapted to the political and economic realities of neoliberal Mexico. In Latin American countries, fathers typically play the role of family provider by taking on low-paying jobs and shouldering financial responsibilities, while mothers manage the home and take primary responsibility for raising children. After immigration though, families often have to restructure into dual-earner households. Financial stress and higher costs of living in the U.S. force mother to enter the labor force for the first time. This creates a difficult adjustment for families. For Latino men invested in traditional gender roles, a working wife publicly displays that the father, as head of the household, could not provide for his family, leading to a sense of inferiority (Ingoldsby, 1991). Meanwhile, both parents working, often in low-paying, physically exhausting, and mentally stressful jobs, meant far less family time and supervision of children (Smokowski & Bacallao, 2011, p. 39-43).

Parrado and Flippen’s (2005) study of immigrant and non-immigrant Mexican women found that in some respects gender roles were more polarized among the immigrant women. Immigrant women reported greater responsibility for household chores and more subordination to their husbands, in spite of being more likely to be employed outside the home than women in Mexico. Parrado and Flippen explain this anomaly in terms of the loss of social power for immigrant Mexican American women and their husbands working in low-paying, low-status jobs on the margins of society. Such an adherence to more traditional

gender roles in the face of stresses to adapt to the new culture may be an example of selective assimilation (Portes & Zhou, 1993), where “the disruptive effects of migration, especially on networks and support, might encourage migrants to resort to rigid and idealized gender behaviors as a defense mechanism against massive loss” (Parrado & Flippen, 2005, p. 611). Coltrane, Parke, and Adams’ (2004) study of father involvement in low-income Mexican American families, where 50 percent of mothers were employed, found that more egalitarian gender role attitudes in fathers was associated with greater father involvement in supervising children and doing housework.

Selective assimilation/acclturation is explained by the phenomenon of segmented assimilation, where social contexts create “destinies of convergence and divergence” (Zhou, 1997) for subgroups of immigrants. The theory proposes three possible outcomes, upward assimilation, downward assimilation, and upward mobility with persistent biculturalism, and three associated acculturation processes, consonant, dissonant, and selective acculturation, respectively. In a diverse, mostly Latino sample of second generation young adult offspring of immigrants, Waters, Tran, Kasinitz, and Mollenkopf (2010) found that most of these young adults were engaged in selective acculturation, but that differences in acculturation processes were not predictive of social outcomes. Valdez (2006), in turn, found evidence for the “downward assimilation” hypothesis among low-skilled Mexicans and the “Anglo-conformity” hypothesis among high-skilled Mexicans. The former group would be expected to be most vulnerable to the

defensive adherence to traditional gender roles, as described by Parrado and Flippen (2005).

The preceding qualitative and quantitative research suggest that parental gender roles change in important ways, as Mexican families cope with adapting to U.S. culture and economic hardship. What is missing from this research is how these changes affect the gender socialization of the children in these families. What happens to the children in these families, where parents are adhering to traditional gender roles as a defense mechanism, while having little time to actually socialize the children into these gender roles nor to practice the family values associated with these gender roles? The present findings and previous research (Kulis et al., 2008, 2010, in press) confirm that gender roles are important predictors of psychological adjustment and substance use in Mexican American adolescents, but these gender roles are linked to parental and peer socialization that interacts with the multidimensional and intersectional processes of acculturation. This needs to be considered in future research in this area.

Design of Prevention Interventions for Substance Use and Other Social Work Implications

Since gender roles are a product of childhood socialization, are linked to a wide range of psychological and social functioning, and are important for adolescent identity development, they are a particularly promising target for interventions to prevent substance use and misuse in adolescence. Mexican heritage adolescents are a particularly interesting group to focus on in terms of the gender role-substance use relationship, given the changes in gender roles,

machismo and *marianismo*, associated with acculturation to U.S. society. The present findings and discussion, in turn, suggest that interventions for substance use with Mexican American adolescents must consider the intersecting influences of gender identity, ethnic identity, and acculturation.

Hawkins, Catalano, & Miller (1992) argue that the design of a multicomponent intervention strategy that seeks to reduce multiple risk factors and simultaneously enhance protective factors among those exposed to risk needs to be guided by a theory of causation and prevention. Such a theory supplies the explanatory framework for the observed evidence regarding risk and protective factors for drug abuse by hypothesizing causal relationships among these variables that lead toward or away from drug abuse. To guide prevention interventions, theory will (a) identify the factors that predict drug abuse, (b) explain the mechanisms through which they operate, (c) identify the factors that influence these mechanisms, (d) predict points to interrupt the course leading to drug abuse, and (e) specify the interventions to prevent onset of drug abuse. In turn, research on interventions needs to incorporate greater rigor in research designs, the incorporation of cultural factors, the exploration of innovative models, the ability to test mediating processes, and the ability to address issues of the fidelity and adaptation of the interventions (Castro et al., 2006).

In applying the social developmental model to design interventions for substance use, Catalano and Kosterman (1996) point out how each of the constructs in the model is a potential focus of intervention. Multiple interventions may be required because there are multiple direct and indirect paths to antisocial

behavior. Interventions to interrupt the causal processes in the development of antisocial behavior would include components seeking to promote processes that enhance constructs on the prosocial path, as well as to interrupt processes that enhance constructs on the antisocial path. The direct and indirect influence of prior behavior on future behavior suggests the importance of intervening early in development to reduce early initiation.

In turn, Coatsworth et al.'s (2000) *ecodevelopmental framework* emphasizes the primary role that families play in the socialization of children, the multiple social contexts beyond family that influence development, the interrelations among contexts, and the changing nature of these contexts and relations over time and how these elements heighten or decrease risk for the development of psychopathology. Ecodevelopmental theory proposes that the social domains for human development can be represented by a set of nested structures, organized into Microsystems (family, school, peers), mesosystems (parent–school or parent–peer relationships), and macrosystems (culture or political climate). In this ecodevelopmental approach, acculturation effects are understood in terms of their interactions with processes in each of the nested ecological systems (Coatsworth et al., 2000).

Coatsworth et al.'s (2000) ecodevelopmental model suggests intervention points and strategies. Marsiglia et al. (2002) recommend that social work interventions support the resiliency characteristics of urban Latino/a youth in different social contexts, such as communities, schools, and families, as well as recruiting these social contexts as partners in the interventions. It is clear that the

emphasis on the family is fundamental in interventions targeting Latino/a youth regarding substance use/abuse. Future social work research in this area should focus on the strengths present within minority families and communities rather than emphasizing the negative stereotypes.

As previously discussed, an important implication of the present findings is that gender roles may be a promising target for interventions aimed at improving coping skills in adolescents to reduce the risk of problem behaviors and substance use. One general Universal prevention strategy, described by Epstein et al. (2002), is based on findings suggesting that competence and its positive impact on psychological wellness protect adolescents from drinking alcohol. Adolescents who were able to make sound decisions and felt more capable experienced greater wellness and engaged in less alcohol use. This implies that competence skills offer protection and promote both mental health and positive behavioral outcomes that affect health. Competence enhancement and coping skills training as means of creating higher psychological wellness constitute another intervention target for reducing adolescent drug use.

Studies of adolescents and adults indicate that gender roles are predictive of adaptive and maladaptive coping styles (Broderick & Korteland, 2002; Lengua & Stormshak, 2000; Washburn-Ormachea, Hillman, & Sawilowsky, 2004). The present findings support the notions that the instrumental aspects of positive masculinity are related to active coping behaviors, such as planning and problem solving, while the emotionally expressive aspects of positive femininity are predictive of adaptively seeking social support. On the other hand, aggressive

negative masculinity leads to maladaptive anger and aggression, while submissive negative femininity reflects the learning of maladaptive avoidant coping behaviors. It can be argued that it would be adaptive to decouple the learning and performance of instrumental and expressive coping behaviors from gender. Coping skills training could focus on teaching the adaptiveness of androgyny, where both boys and girls are able to engage in both instrumental and expressive modes of social coping and functioning (Steenbarger & Greenburg, 1990; Wells, 1980). One caveat here, though, is that the small effect sizes of adaptive coping in predicting substance use found in the present research may indicate that such coping skills interventions may only have small effects in reducing risk behaviors.

With specific reference to Mexican American adolescents, Arciniega et al. (2008) distinguish between traditional *machismo* and the emotional connectedness of *caballerismo*. Such emotional connectedness is consistent with the affective femininity found in the present analyses to be associated with lower antisociality and substance use. Teaching Mexican American boys this distinction in defining masculinity and in how to engage in relationship-based coping, as well as basing such an intervention on an important cultural tradition, is likely to be helpful not just in reducing problematic behaviors, but also in reducing conflicts about gender roles in acculturation. For example, Mexican American adolescent boys need to understand that the process of acculturation and the learning of more emotion-focused coping behaviors is not linked to a loss of their masculine identity.

Meanwhile, Denner and Dunbar's (2004) qualitative study of adolescent Mexican American girls found that these girls were well aware of the external

limits on their power, due to the expectations of both Mexican and mainstream American culture and that being a girl entails being vulnerable and having obligations to family. Nevertheless, these girls were also able to critique these expected gender roles and see opportunities to speak up and be strong.

Another key point for intervention in adolescent substance use is peer relationships. As Oetting and Beauvais (1987) point out, the need to conform to the values and behaviors of the peer cluster is extremely high, and this need to conform is not likely to be changed by any realistically brief treatment or therapy. If the peer cluster is not changed or if the youth's relation to that cluster is not changed, the peer cluster will continue to encourage and maintain drug involvement. If, however, treatment includes weaning away the youth from a drug-involved peer cluster and toward being a member of a peer cluster that discourages drug use, the effects of treatment can be enhanced.

Hawkins, Catalano, & Miller (1992) note that the most heavily researched Universal prevention strategy for addressing social influences to use drugs is classroom-based skills training for adolescents in Grades 5 through 10 that teaches students through instruction, modeling, and role play to identify and resist influences to use drugs and, in some cases, to prepare for associated difficulties and stresses anticipated in the process of resisting such influences. These interventions often also include normative-change components to depict drug use as socially unacceptable, identify short-term negative consequences of drug use, encourage children to make public commitments to remain drug free, and, in some instances to use peer leaders to teach the curriculum (Botvin, 1986).

The relationship of gender roles to peer relationships is largely unstudied, although it is theoretically reasonable to believe that there are connections. For example, Washburn-Ormachea et al. (2004) found that femininity and androgyny were predictive of a greater sensitivity to peer-caused stress. It may be that the gender role-based coping skills interventions discussed above may also have salutary effects on adolescents' peer relationships.

Another point of intervention to prevent problem behaviors and substance use in Mexican American adolescents is the family, but here issues of acculturation and gender roles especially need to be taken into account. Pantin et al. (2003) describe how the Familias Unidas intervention program is intended to provide parents with skills for reinstating their authority, reaching out to their adolescents, and becoming positively involved in their adolescents' lives. The program is delivered in a parent-centered format with three parts, namely engagement, skill development, and skill application. Engagement is achieved by providing social support and validation for the family, including acknowledging the reality in which it exists. Parent skill development occurs by way of group participatory exercises in which trained facilitators introduce family, school, and peer management techniques and encourage parents to practice those skills with other parents in the group. Skill application occurs by way of planned conversations in which parents teach (i.e., transfer) the skills and information acquired in group to their adolescents.

Many studies, however, find that acculturation leads to conflict between an unacculturated parent and an acculturated or Americanized peer, leading to a

loss of parental leadership in the eyes of the adolescent and an increased risk for behavior problems among Mexican heritage youth (Schwartz et al., 2006).

Marsiglia et al. (2002) found that acculturation interacted with family conflict to predict both internalizing and externalizing behavior, and acculturation interacted with support between family and school to predict externalizing behavior. The pattern of these interactions suggested that family conflict was particularly deleterious for psychological adjustment for high acculturated girls, while support between family and school was particularly salutary for low acculturated girls. It is likely that the loss of *marianismo* in high acculturated Mexican American girls may be important here, suggesting the need for teaching these girls more adaptive feminine and masculine gender role cognitions and behaviors. *Machismo* may also be associated with a familism that is eroded by acculturation to U.S. cultural values. Here again, the learning of adaptive gender roles may attenuate the effects of acculturation in breaking down parental authority and familial relationships.

Studies typically have found that acculturation is associated with greater drug use in Mexican heritage adolescents (Alvarez et al., 2009). Gil, Wagner, and Vega (2000) found that, acculturation to American norms and values increased alcohol use among Latino adolescent population by breaking down traditional Latino family values, weakening collectivist values, and producing acculturation stress. Gil, Wagner, & Tubman (2004) found that both acculturation and acculturation stress were correlated with drug use among Mexican heritage youth. Marsiglia et al. (2002, 2005) argue that lowering the negative consequences of

acculturation stress on youth and assisting them in maintaining their protective ties to family and culture of origin could have great prevention impact. Schwartz et al. (2006) argue that (a) social and cultural identity underlie acculturation and (b) personal identity can help to ‘anchor’ the immigrant person during cultural transition and adaptation. They recommend interventions to alleviate cultural identity confusion in adolescents with multiple heritage cultures, the creation of specific social institutions to ease newcomers’ transition into the receiving society, and for youth confronted with socioeconomic disadvantage, interventions to work within the constraints imposed by such disadvantage and help them to develop a positive, rather than negative, personal and social identity.

The present findings and those by Kulis, Marsiglia, and Nagoshi (2010; in press) suggest that gender role conflict as a result of acculturation may be a particular problem for Mexican American girls, again suggesting the need for interventions focusing on developing more adaptive gender role cognitions and behaviors. Kulis et al. (2007), in discussing the findings from the randomized trial of *keepin’ it REAL*, described how for less linguistically acculturated Latinos, the intervention was significantly more effective among boys than among girls in preventing increases in recent alcohol and cigarette use and in retarding the adoption of pro-drug norms. Less acculturated Latinas were at the lowest level of risk, and their low baseline frequency of substance use suggested that less acculturated Latinas may be sheltered from substance use at least temporarily, possibly due to culturally prescribed, gender specific anti-drug norms and behaviors. However, their lack of exposure to and experience dealing with riskier

situations may place them at greater risk than their White female counterparts at later developmental junctures. Less acculturated Latino boys—with their higher baseline substance use rates and stronger pro-drug norms—benefited more immediately from the intervention than their female counterparts. The results of this study suggested that prevention efforts may be strengthened by attending to the special risks and resiliencies of certain subgroups of female and male youth.

Marsiglia et al. (2002) also argue that, on the macro level, the placement of institutional support for Latino/a families is essential to enhancing youth resiliency, but another vital element is the impact of schools in creating attachment and commitment with the youth. The school on a mezzo level serves to create social bonds that resist the strains of the urban context and lack of community activities. The school is a vital link between the community and the family system and has tremendous potential for intervention strategies. Social workers working from schools can provide services that nurture and maintain the protective effects of family and culture of origin as youth go through the acculturation process. Cultural sensitivity in this context is essentially adapting prevention curricula to accommodate a new intended audience by matching curricula to observable, superficial characteristics and by the understanding of cultural, social, historical, environmental, and psychological forces that influence target health behavior (Hecht & Krieger, 2006). Such cultural sensitivity must include an appreciation of how Mexican American adolescents' psychological adjustment may be impacted by conflicts between the ethnic identities and gender

roles that they adhere to in their families vs. the ethnic identities and gender roles expected in their school environments.

Finally, the present findings suggest the need for interventions for substance use particularly tailored for adolescent Mexican American girls. Kulis, Marsiglia, and Hurdle (2003) propose that the narrowing of the gender gap in adolescent drug use is attributable, at least in part, to the selective erosion of stereotypical gender identities over historical time. They suggest that “girls are acting like boys,” rather than that some form of “gender blending” is occurring, and that traits commonly thought to be reserved to risk-taking adolescent males now register as potent risk factors for girls as well. Kulis et al. (2003), however, also consider the protective aspects of gender roles, noting that assertive masculinity, affective femininity and submissive femininity had typically protective effects against drug use, regardless of gender, but that these effects applied more often to acculturated Mexican Americans and non-Latinos than to less acculturated Mexican Americans. Femininity may be a proxy for another protective factor, such as family-centeredness, which may buffer against negative peer influences.

Prior research (LeCroy, 2005) has suggested that a universal gender specific prevention program that takes into account girls’ unique aspects of development (LeCroy & Daley, 2001) can help to empower girls. Adolescence is a period that represents changes in girls’ physical, cognitive, emotional, and social development. During early adolescence, there are behaviors that emerge that can lead to a greater likelihood of negative behaviors in the future. Gender-specific

programs such as "Go Grrrls" (LeCroy & Daley, 2001) are important because of these biological, psychological, and social changes that take place during adolescence. For example, physical maturation can be a negative experience for girls (Benjet & Hernandez-Guzman, 2002) and has been linked with body image disorders (Attie & Brooks-Gunn, 1989), depression, low self-esteem (Brooks-Gunn & Reiter, 1990; Fabian & Thompson, 1989), and delinquency (Caspi, 1995), such as substance use (Tanner-Smith, 2010). The "Go Grrrls" curriculum (LeCroy & Daley, 2001; LeCroy, 2005) is informed by understanding the timing of the intervention and the selection of relevant issues and having a focus on reducing identified risk factors. For example, at puberty, gender-related expectations can influence girl's behavior; therefore, enhancing positive messages about gender roles and promoting a more positive sex role self-image can be a target of intervention. Effective coping strategies can be taught by promoting positive decision making and personal assertiveness, girls' achievement motivation can be enhanced by building their confidence for educational/vocational aspirations and teaching a "mastery orientation," as opposed to a learned helplessness orientation (LeCroy, 2005, p. 3).

Social workers should be educated on the functional value of gender roles and how these gender roles interact with gender and cultural factors in predicting psychological adjustment, including drug use. Such knowledge should increase social workers' effectiveness in designing interventions and working with at-risk adolescent populations. Social workers should work for policies that promote gender equality, as well as protections for those who do not conform to traditional

norms for gender roles, gender identity, or sexual orientation (Nagoshi & Brzuzy, 2010). Promoting such policies is a desirable goal in and of itself, but would also give adolescents more freedom to develop gender roles that are more socially adaptive and, therefore, more protective against drug use and abuse.

In general, social workers need to be cautious not to fall into stereotyping cultural beliefs. Most cultural values, including gender roles, have both positive and negative aspects. Social workers need to be aware of the full complexity of these cultural values and should not assume to focus on the negative aspects (Furman & Negi, 2010). An individual's cultural values and beliefs can be both a source of strength and resilience. Having large family networks and strong family ties can serve as a protective factor. Also, youth who engage in these positive aspects of *marianismo* and *machismo* can serve as a mechanism of cultural connectives with their families and their country of origin.

Limitations

This sample was a large sample for a randomized trial that included an array of the public schools in a large southwestern city, schools located mostly in lower income and heavily Latino neighborhoods. The sample, however, may not be representative of all Mexican American students of this age, especially those of higher socioeconomic backgrounds, those in more ethnically mixed schools, and those in regions of the country with a different immigration history and proximity to Mexico. Also, similar to the positive aspects of *marianismo* in Mexico, as Montoya (2007) points out, in parts of Latin America women's roles in society

are highly valued. Therefore, cross cultural differences should be taken into consideration for future research.

The study's cross-sectional design limits causal inferences. There may have been bidirectional relationships among gender roles, the functional mediators, and substance use, or the relationships among the variables may have been due to some third variable not in the causal model tested. A longitudinal design involving measurements of gender roles, functional mediators, and substance use at several time points would be of use to trace the effect of early gender role socialization on later adolescent and young adult substance use, as well as permit the examination of important mediating variables, such as internalizing and externalizing problem behaviors. It should be noted that, while we controlled for age in this study, early adolescent human development factors, such as body image and self-esteem, were not accounted for in this model and should be considered in future research.

Given that this was a secondary data analysis project, the conceptualization and implementation of the analyses were limited to the measures that were available in the existing data set. In several cases, these measures were psychometrically problematic, compared to measures that might have been used had the present study questions been the focus for the design of the data collection. The gender role measures had only a few items for each subscale, and the internal consistency (α) of some of these subscales was marginal. Because gender roles are a social construction, there could be a high social desirability bias when asking questions about them (this may be reflected in

the high positive correlations among the gender role measures in the present study). In this study we only used a one item measure of depression. Future research should include a larger number of depression/internalizing items, such as the Child Behavior Checklist (Achenbach, & Edelbrock, 1983). It should also be noted that measures of depression have been shown to lack cultural sensitivity, and at times, measures of depression, when converted from English to Spanish, may not translate well (Rogler, 1999). An important limitation of the measures used, including those for gender roles, antisociality, depression, and coping, is that they are based on the rationalist cultural context of the mainstream U.S. and may not be sensitive to the nuances of Mexican and Mexican American culture. Rogler (1999) cautions that the imposition of U.S.-based “procedural norms” in cross-cultural research may confound cultural understanding. He suggests that researchers 1) document the modifications that are made to measures for cross-cultural research, 2) acknowledge the tentative connections between concepts and measures, and 3) pay attention to methodologically relevant meanings in the respondents’ culture.

Future Research

The above results underline the need for further research to better understand how adolescent boys and girls perceive their gender roles and gender identity in connection with their drug-using behaviors. This may be a particularly salient issue for Mexican American adolescents. Gender identity may be interrelated with other potential risk and resiliency factors, such as the absence of positive male role models, lack of structure, parental supervision, independence,

difficult childhood mood or temperament, childhood emotional distress, behavioral problems, school failure, low academic achievement, relationships with drug-using peers, alienation, self-efficacy, problem solving skills, personal goals, nurturing, and humor (Kulis et al., 2002).

There is an extensive research and theoretical literature on the socialization processes by which gender roles are trained in children, including the consideration of family, peer, and societal influences (e.g., Block, 1983), and it would be useful to apply this literature to specifically understanding the socialization of gender roles in Mexican American adolescents. There is a need to examine how adults in facilitating positions communicate with youth about gender role/identity issues and provide sufficient alternatives for youth of both genders to express themselves freely vs. being limited to traditional binary definitions of gender role expression and gender identity (Kulis et al., 2002).

Future research should assess the development and socialization of gender roles and their functional mediators, such as coping behaviors and peer relationships, in Mexican American adolescents longitudinally to better demonstrate causal relationships and identify targets for intervention. There needs to be more clarity on the nature of gender roles and how they are measured. As Gill et al. (1987) point out, there needs to be more clarity on what is meant by instrumentality vs. expressivity and on the items on scales used to describe these constructs. This is even more of an issue, when positive vs. negative gender roles are proposed. A functional approach to gender roles based on Spence's (1984) ideas would also need to take into account the functional value of androgyny and

differentiate this from gender role confusion or conflict. It would also be useful to understand the socialization processes by which gender roles are trained in children and also the protective effects of androgyny (Spence & Helmreich, 1980). Future research should also explore alternative pathways for gender and gender roles predicting substance use (e.g., drug offers, opportunity structures, compositions of peer networks) and whether these differ in Mexican adolescents versus the general adolescent population.

A multimethod, mixed design approach that combines quantitative and qualitative methods and encompasses an intersectional perspective should be implemented to better understand multiple, intersecting identities and social oppressions as they dynamically interact with the many dimensions and levels of the acculturation process (Schwartz et al., 2010). While positivistic quantitative approaches are important for assessing the various identity dimensions that the dominant culture imposes on the immigrant, understanding how the immigrant negotiates these social oppressions and intersecting social identities to self-construct their individual identity is through qualitative methodologies is vital (Nagoshi & Brzuzy, 2010). Such a multimethod approach would also be useful for designing and evaluating interventions targeting gender roles to improve the psychological and social functioning of Mexican American adolescents.

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Table 1 *Means and Standard Deviations by Sex*

Scale	Boys			Girls			<i>t</i>
	N	Mean	S.D.	N	Mean	S.D.	
Age	450	10.37	0.54	505	10.26	0.49	3.29***
Grades in school	449	6.51	1.46	505	7.00	1.23	-5.62***
School lunch	430	1.34	0.63	493	1.31	0.59	0.83
Two parents	450	0.74	0.44	505	0.74	0.44	-0.04
Linguistic acculturation	437	3.34	0.81	500	3.32	0.73	0.35
Assertive masculinity	397	2.19	1.08	470	2.55	0.90	-5.35***
Affective femininity	400	1.90	0.97	469	2.54	0.88	-10.16***
Aggressive masculinity	402	1.11	0.89	470	1.10	0.79	0.25
Submissive femininity	397	1.36	0.84	469	1.62	0.70	-4.82***
Antisociality	378	0.13	0.86	450	-0.13	0.54	5.30***
Depressive symptoms	383	1.86	1.12	455	2.65	1.22	-9.67***
Positive, adaptive coping	416	-0.10	0.92	488	0.09	0.78	-3.38***
Negative, avoidant coping	412	0.08	0.87	485	-0.06	0.71	2.79**
Alcohol use	442	-0.02	0.94	500	0.01	0.90	-0.56
Cigarette use	445	0.03	1.11	502	-0.03	0.81	1.11
Marijuana use	443	0.03	1.05	500	-0.04	0.86	1.16

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 2 *Intercorrelations of Acculturation, Gender Roles, and Mediators by Sex¹*

	Ling. accult.	Assr. masc.	Afft. femn.	Aggr. masc.	Subm. femn.	Anti- soc.	Depr. symp.	Adap. copn.	Avoid. copn.
Linguistic acculturation		.03	-.04	.13**	.02	-.06	.11*	.03	.01
Assertive masculinity	.11**		.59***	-.08	.15***	-.09	-.04	.24***	-.23***
Affective femininity	.02	.66***		-.20***	.25***	-.14**	-.06	.33***	-.14**
Aggressive masculinity	.01	.26***	.13*		.41***	.17***	.25***	-.15**	.15***
Submissive Femininity	.03	.42***	.44***	.47***		.10*	.23***	.02	.14**
Antisociality	-.04	.07	-.10	.31***	.01		.20***	-.15***	.22***
Depressive symptoms	.00	.11*	.08	.11*	.06	.42***		-.04	.19***
Positive, adaptive coping	.04	.17***	.23***	-.20***	.04	-.22***	.01		-.09*
Negative, avoidant coping	-.04	-.12*	-.10	.12*	.10	.23***	.11*	.14**	

¹Females above the diagonal. Males below the diagonal.

* p < .05 ** p < .01 *** p < .001

Table 3 *Correlations of Acculturation, Gender Roles, and Mediators with Substance Use*

	Boys			Girls		
	Alc.	Cig.	Mar.	Alc.	Cig.	Mar.
Linguistic acculturation	-.04	.00	.03	-.02	.00	.02
Assertive masculinity	.01	-.06	.05	-.03	-.02	-.02
Affective femininity	-.08	-.11*	-.05	-.10*	-.03	-.03
Aggressive masculinity	.22***	.16***	.27***	.14**	.08	.19***
Submissive femininity	-.06	-.14**	.02	.02	-.04	.08
Antisociality	.39***	.34***	.44***	.31***	.15**	.33***
Depressive symptoms	.16**	.17***	.13*	.08	.07	.11*
Positive, adaptive coping	-.09	-.16***	-.19***	-.16***	-.12**	-.10*
Negative, avoidant coping	.00	-.09	-.02	.06	-.01	.07

p < .05 ** p < .01 *** p < .001

Table 4 *Summary of Significant Standardized Path Coefficients for Gender Roles and Mediators on Alcohol, Cigarette, and Marijuana Use for Boys*

Outcome	Gender Role	Mediator	Gender Role Effect on Mediator	Mediator Effect on Outcome	Mediated Effect estimate, p value, [95% C.I.]
Alcohol	Assertive masculinity	Antisociality	.113	.425***	.048, p < .05, [.002, .127]
Cigarettes	Assertive masculinity	Antisociality	.112	.424**	.047, p < .05, [.001, .151]
Alcohol	Assertive masculinity	Avoidant Coping	-.096	-.140*	.013, p < .05, [.000, .043]
Cigarettes	Assertive masculinity	Avoidant Coping	-.098	-.186*	.018, p < .05, [.000, .057]
Marijuana	Assertive masculinity	Avoidant Coping	-.097	-.152*	.015, p < .05, [.001, .048]
Alcohol	Affective Femininity	Antisociality	-.138*	.425***	-.058, p < .05, [-.147, -.007] ^a
Cigarettes	Affective Femininity	Antisociality	-.136*	.424***	-.058, p < .05, [-.158, -.008] ^a
Marijuana	Affective Femininity	Antisociality	-.128	.574***	-.073, p < .05, [-.177, -.007] ^a
Alcohol	Aggressive Masculinity	Antisociality	.314***	.425***	.133, p < .01, [.037, .277] ^a
Cigarettes	Aggressive Masculinity	Antisociality	.314***	.424***	.133, p < .01, [.021, .318] ^a
Marijuana	Aggressive Masculinity	Antisociality	.308***	.574***	.177, p < .01, [.059, .353] ^a
Alcohol	Submissive Femininity	Avoidant Coping	.177*	-.140*	-.025, p < .05, [-.077, -.003]
Cigarettes	Submissive Femininity	Avoidant Coping	.176*	-.186*	-.033, p < .05, [-.094, -.004]
Marijuana	Submissive Femininity	Avoidant Coping	.176*	-.152*	-.027, p < .05, [-.075, -.004]

* p < .05 ** p < .01 *** p < .001

^aHypothesized pathway

Table 5 *Summary of Significant Standardized Path Coefficients for Gender Roles and Mediators on Alcohol, Cigarette, and Marijuana Use for Girls*

Outcome	Gender Role	Mediator	Gender Role Effect on Mediator	Mediator Effect on Outcome	Mediated Effect estimate, p value, [95% C.I.]
Alcohol	Affective Femininity	Antisociality	-.063*	.459***	-.029, p < .05, -.072, -.004
Cigarettes	Affective Femininity	Antisociality	-.067*	.171	-.011, p < .05, -.033, -.002
Marijuana	Affective Femininity	Antisociality	-.067*	.492**	-.033, p < .05, -.090, -.007
Alcohol	Affective Femininity	Adaptive Coping	.145**	-.135*	-.020, p < .05, -.051, -.001 ^a
Cigarettes	Affective Femininity	Adaptive Coping	.147**	-.131	-.019, p < .05, -.052, -.001 ^a
Alcohol	Aggressive Masculinity	Antisociality	.100**	.459***	.046, p < .01, .009, .099 ^a
Cigarettes	Aggressive Masculinity	Antisociality	.099**	.171	.017, p < .05, .003, .050 ^a
Marijuana	Aggressive Masculinity	Antisociality	.099**	.492**	.048, p < .01, .010, .120 ^a
Alcohol	Aggressive Masculinity	Adaptive Coping	-.157***	-.135*	.021, p < .05, .001, .060
Cigarettes	Aggressive Masculinity	Adaptive Coping	-.156***	-.131	.020, p < .05, .000, .055

* p < .05 ** p < .01 *** p < .001

^aHypothesized pathway

Figure Caption

Figure 1. The Functional Model of Gender Roles (Spence, 1984) conceptualized in terms of assertive vs. aggressive masculinity and affective vs. submissive femininity.

Masculinity/Instrumentality

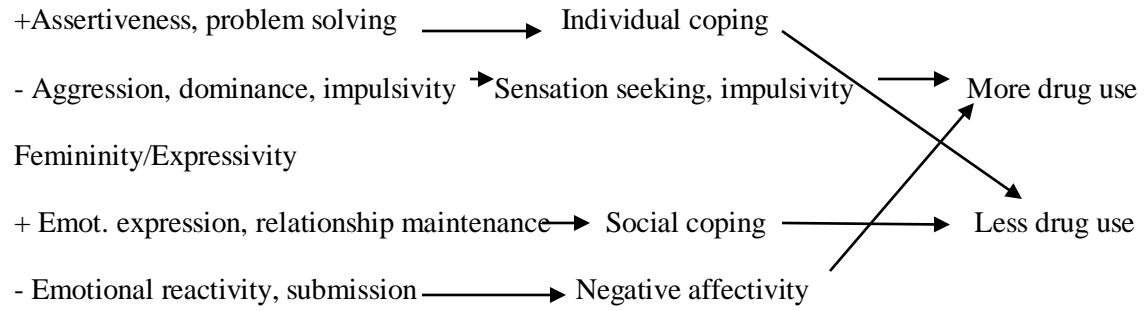


Figure Caption

Figure 2. Main effects path model to be tested showing hypothesized mediated pathways from gender roles to substance use for boys and girls. Pathways for linguistic acculturation and direct pathways between gender roles and substance use are not shown.

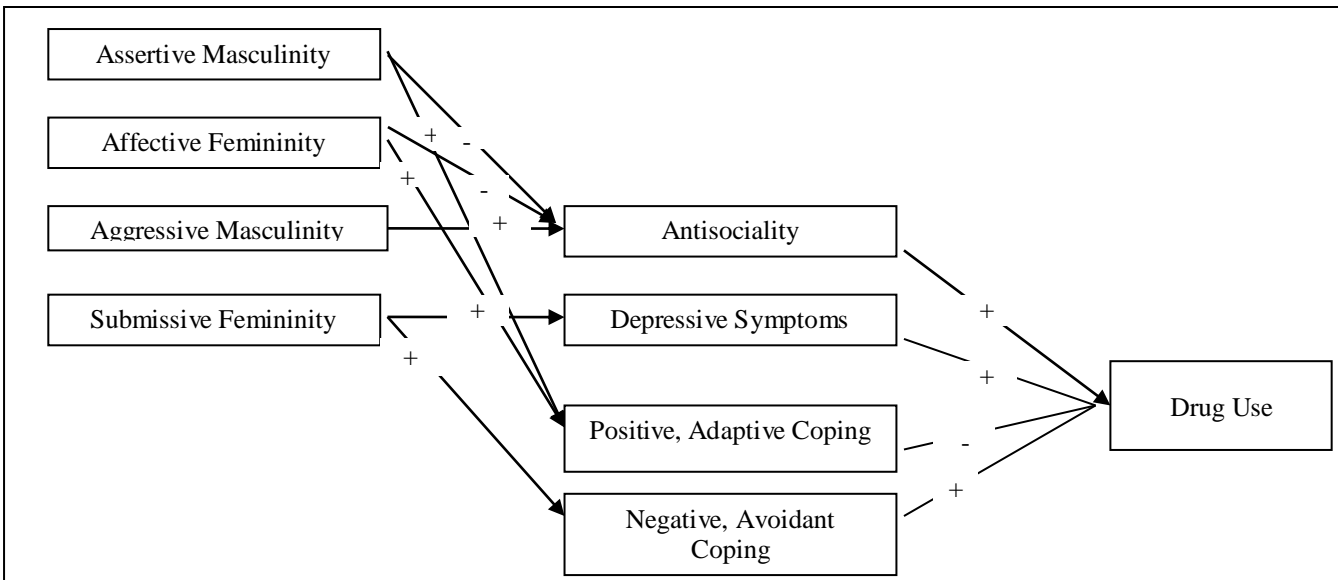


Figure Caption

Figure 3. Full path model to be tested showing hypothesized mediated pathways from gender roles to substance use and moderation of gender roles by acculturation for boys. Unmoderated pathways for linguistic acculturation and direct pathways between gender roles and substance use are not shown. A negative direct path from linguistic acculturation X aggressive masculinity to substance use and a positive direct path from linguistic acculturation X affective femininity to substance use are also predicted but not shown.

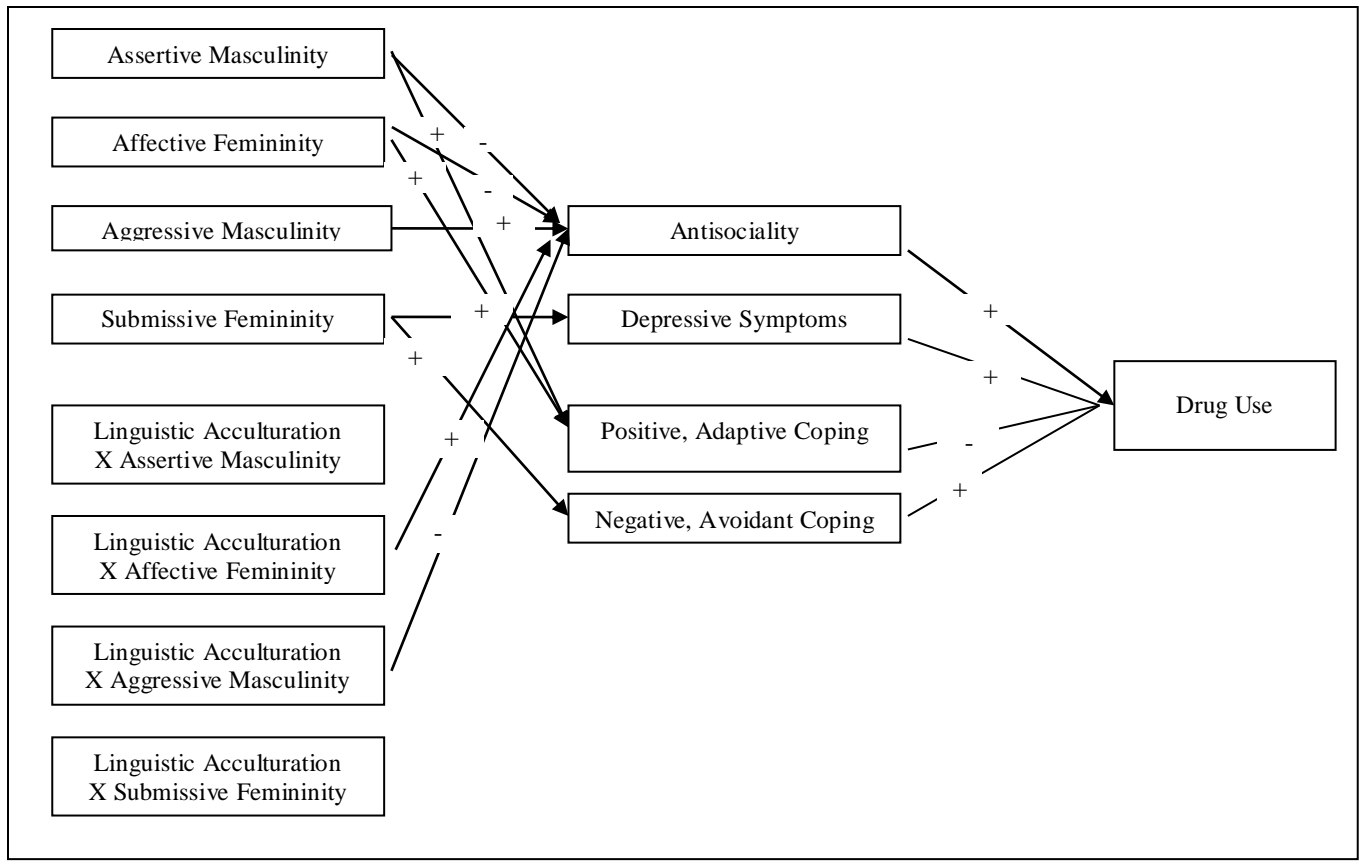


Figure Caption

Figure 4. Full path model to be tested showing hypothesized mediated pathways from gender roles to substance use and moderation of gender roles by acculturation for girls. Unmoderated pathways for linguistic acculturation and direct pathways between gender roles and substance use are not shown.

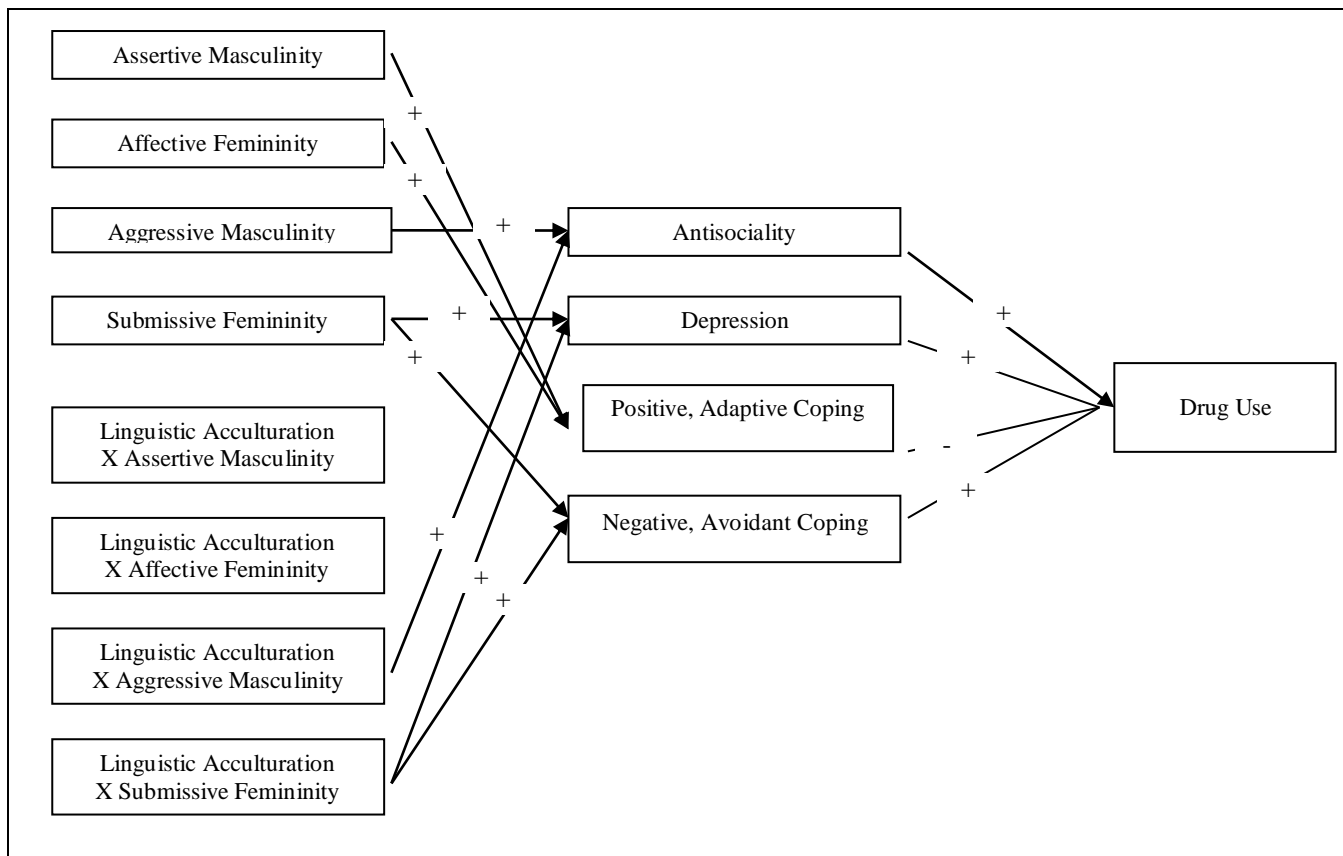


Figure Caption

Figure 5. Significant paths of main effects model from gender roles to alcohol use for boys. The direct and indirect paths from linguistic acculturation to alcohol use were all non-significant and are not shown. R^2 : alcohol use .154, antisociality .102, depressive symptoms .044, adaptive coping .121, avoidant coping .047.

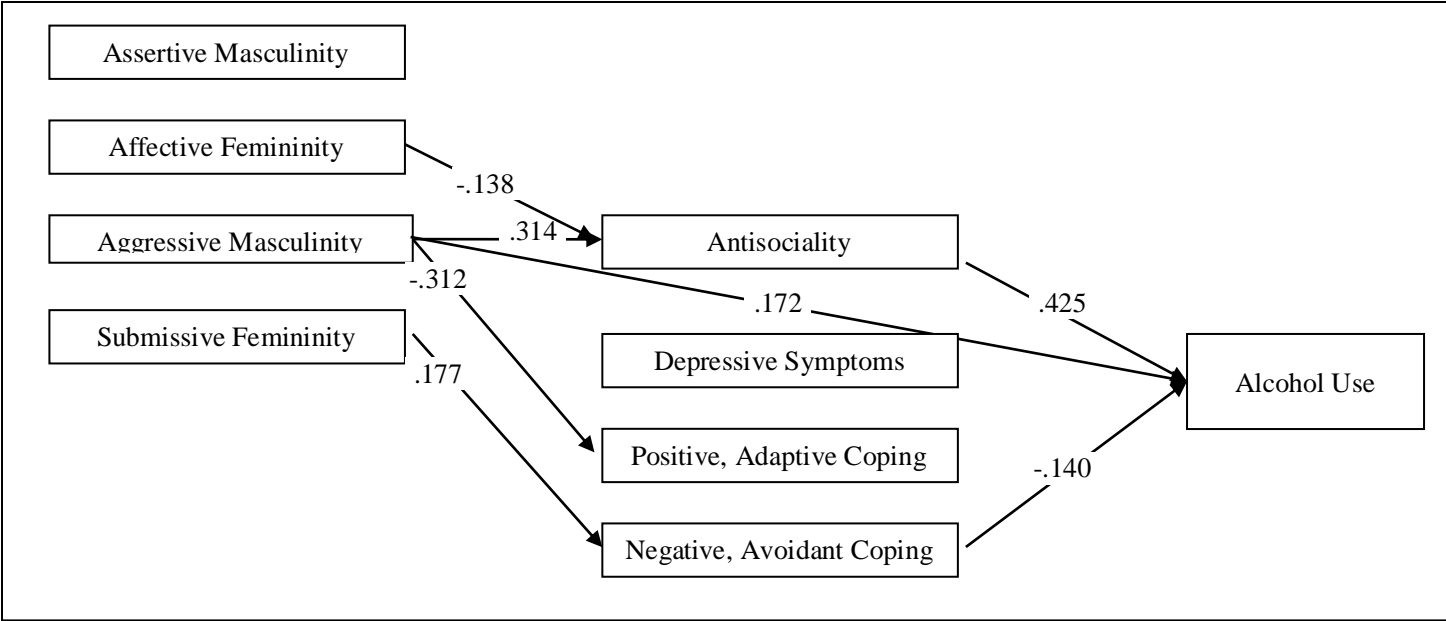


Figure Caption

Figure 6. Significant paths of main effects model from gender roles to cigarette use for boys. The direct and indirect paths from linguistic acculturation to cigarette use were all non-significant and are not shown. R^2 : cigarette use .182, antisociality .102, depressive symptoms .044, adaptive coping .118, avoidant coping .048.

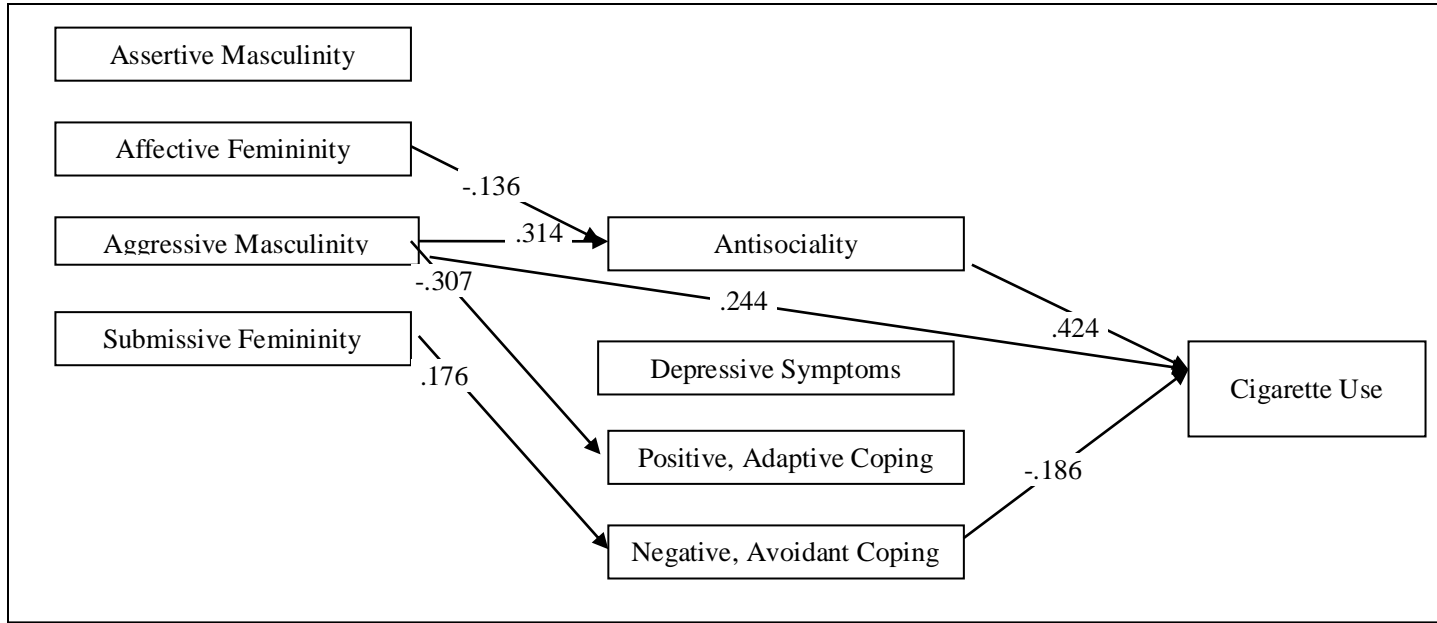


Figure Caption

Figure 7. Significant paths of main effects model from gender roles to marijuana use for boys. The direct and indirect paths from linguistic acculturation to marijuana use were all non-significant and are not shown. R^2 : marijuana use .230, antisociality .097, depressive symptoms .044, adaptive coping .117, avoidant coping .048.

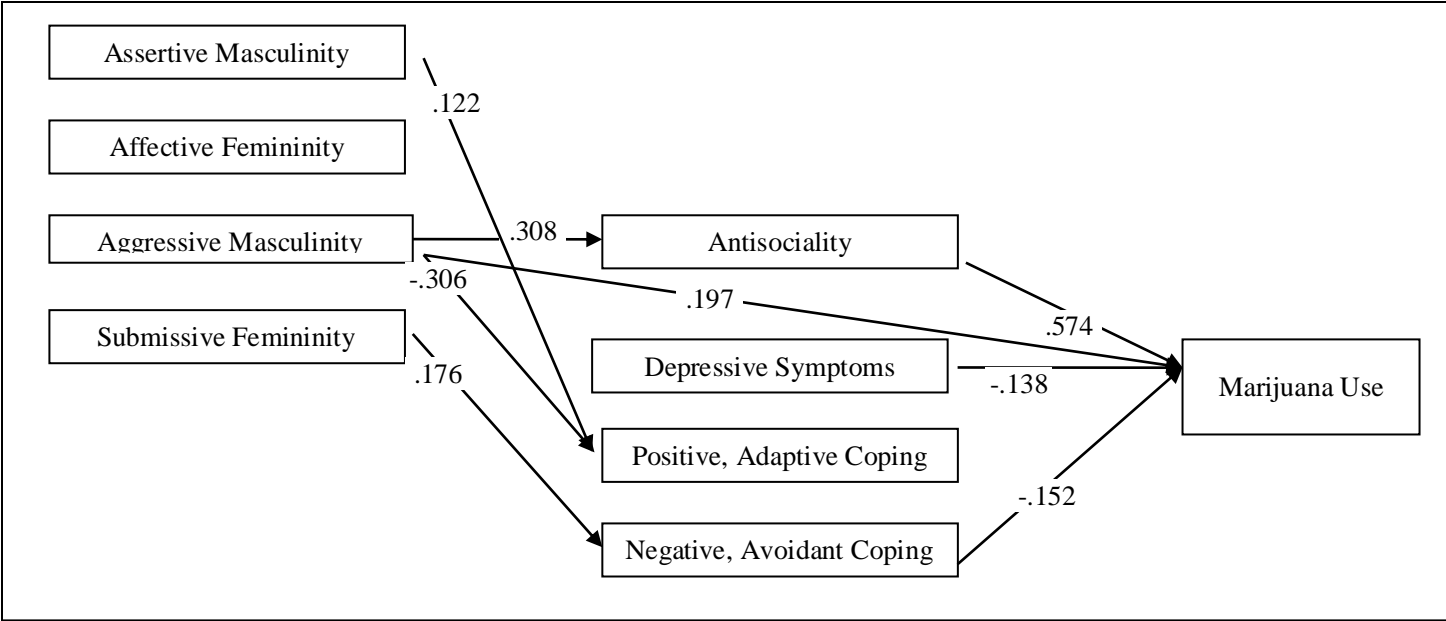


Figure Caption

Figure 8. Significant paths of main effects model from gender roles to alcohol use for girls. The direct and indirect paths from linguistic acculturation to alcohol use were all non-significant and are not shown. R^2 : alcohol use .094, antisociality .042, depressive symptoms .083, adaptive coping .072, avoidant coping .077.

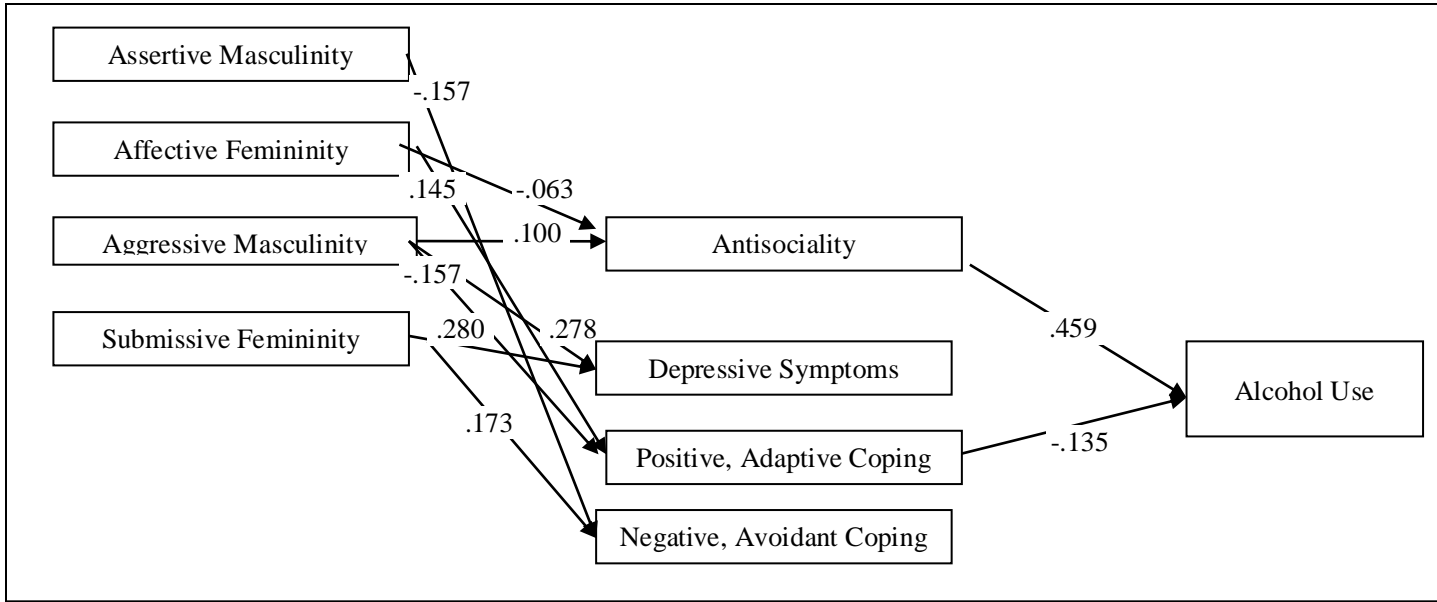
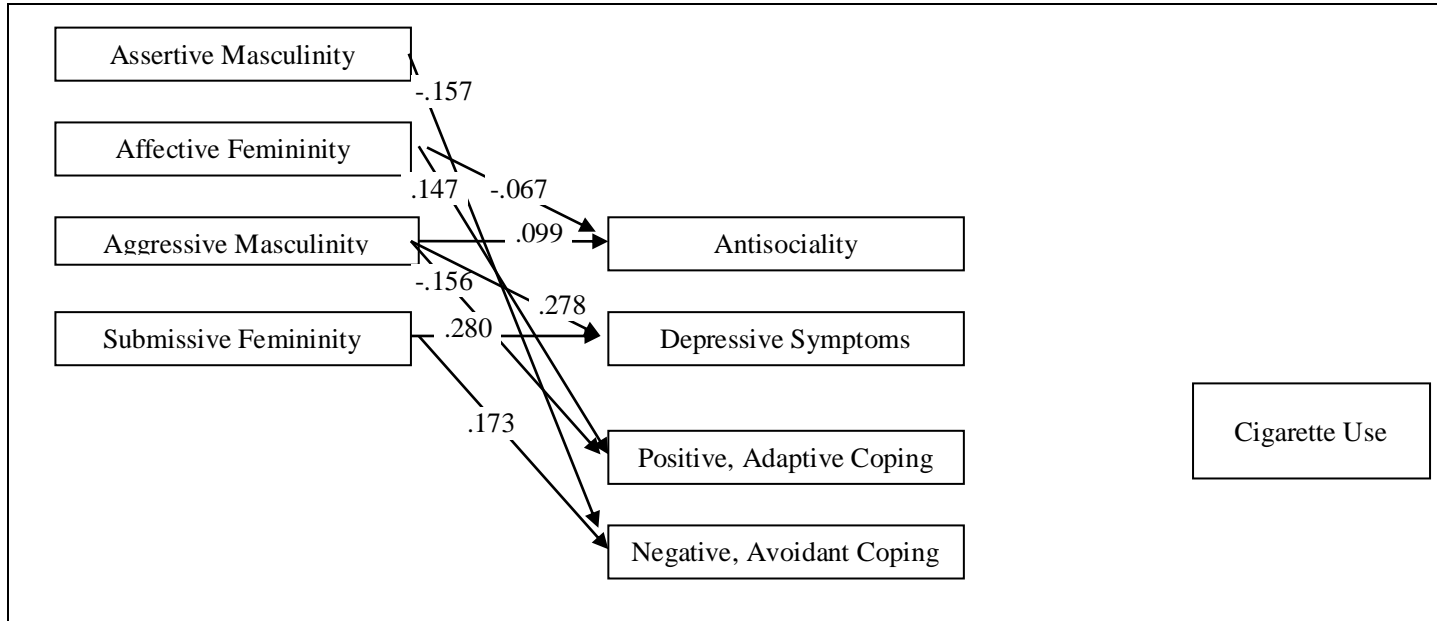


Figure Caption

Figure 9. Significant paths of main effects model from gender roles to cigarette use for girls. The direct and indirect paths from linguistic acculturation to cigarette use were all non-significant and are not shown. R^2 : cigarette use .046, antisociality .044, depressive symptoms .083, adaptive coping .073, avoidant coping .077.



Cigarette Use

Figure Caption

Figure 10. Significant paths of main effects model from gender roles to marijuana use for girls. The direct and indirect paths from linguistic acculturation to marijuana use were all non-significant and are not shown. R^2 : marijuana use .130, antisociality .044, depressive symptoms .083, adaptive coping .073, avoidant coping .077.

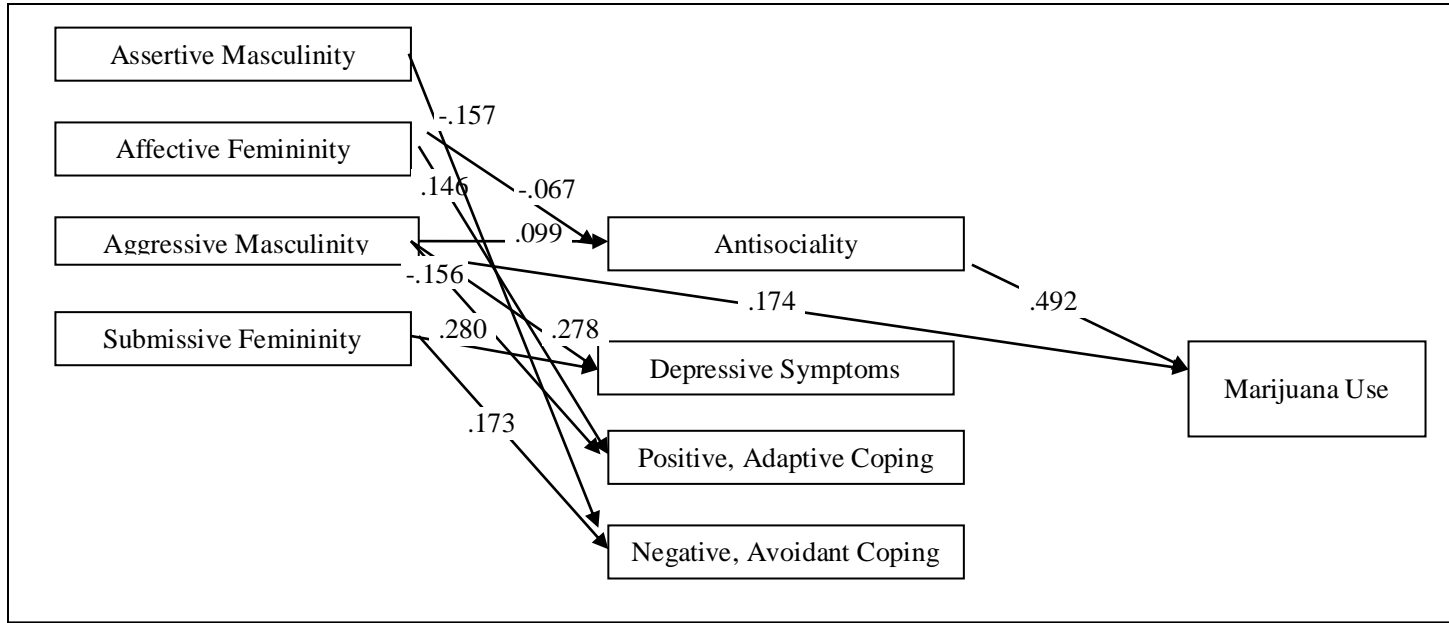


Figure Caption

Figure 11. Significant paths of full model from gender roles to alcohol use for boys. The direct and indirect paths from linguistic acculturation to alcohol use were all non-significant and are not shown. R^2 : alcohol use .162, antisociality .115, depressive symptoms .055, adaptive coping .144, avoidant coping .061.

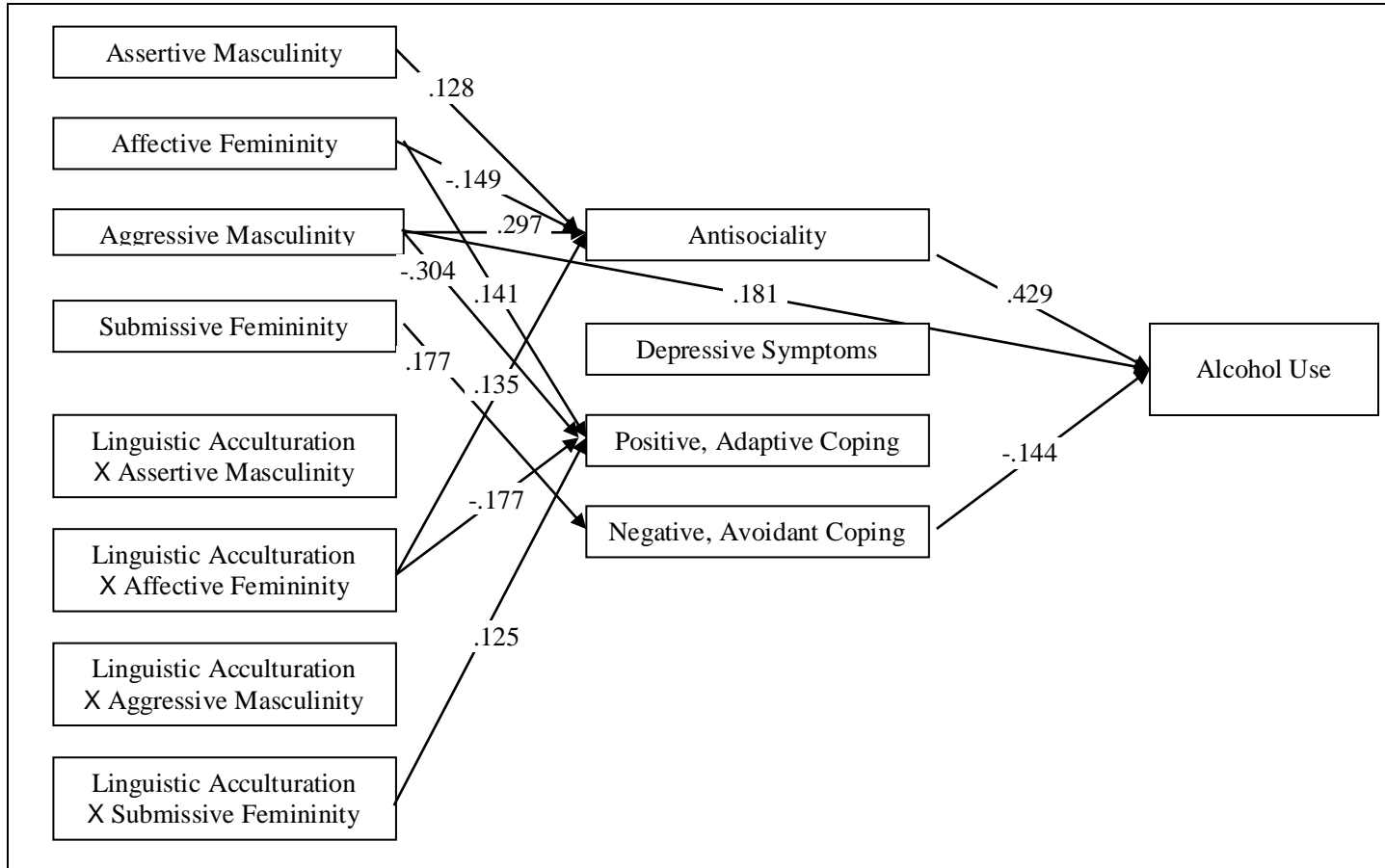


Figure Caption

Figure 12. Significant paths of full model from gender roles to cigarette use for boys. The direct and indirect paths from linguistic acculturation to cigarette use were all non-significant and are not shown. R^2 : cigarette use .190, antisociality .116, depressive symptoms .055, adaptive coping .143, avoidant coping .061.

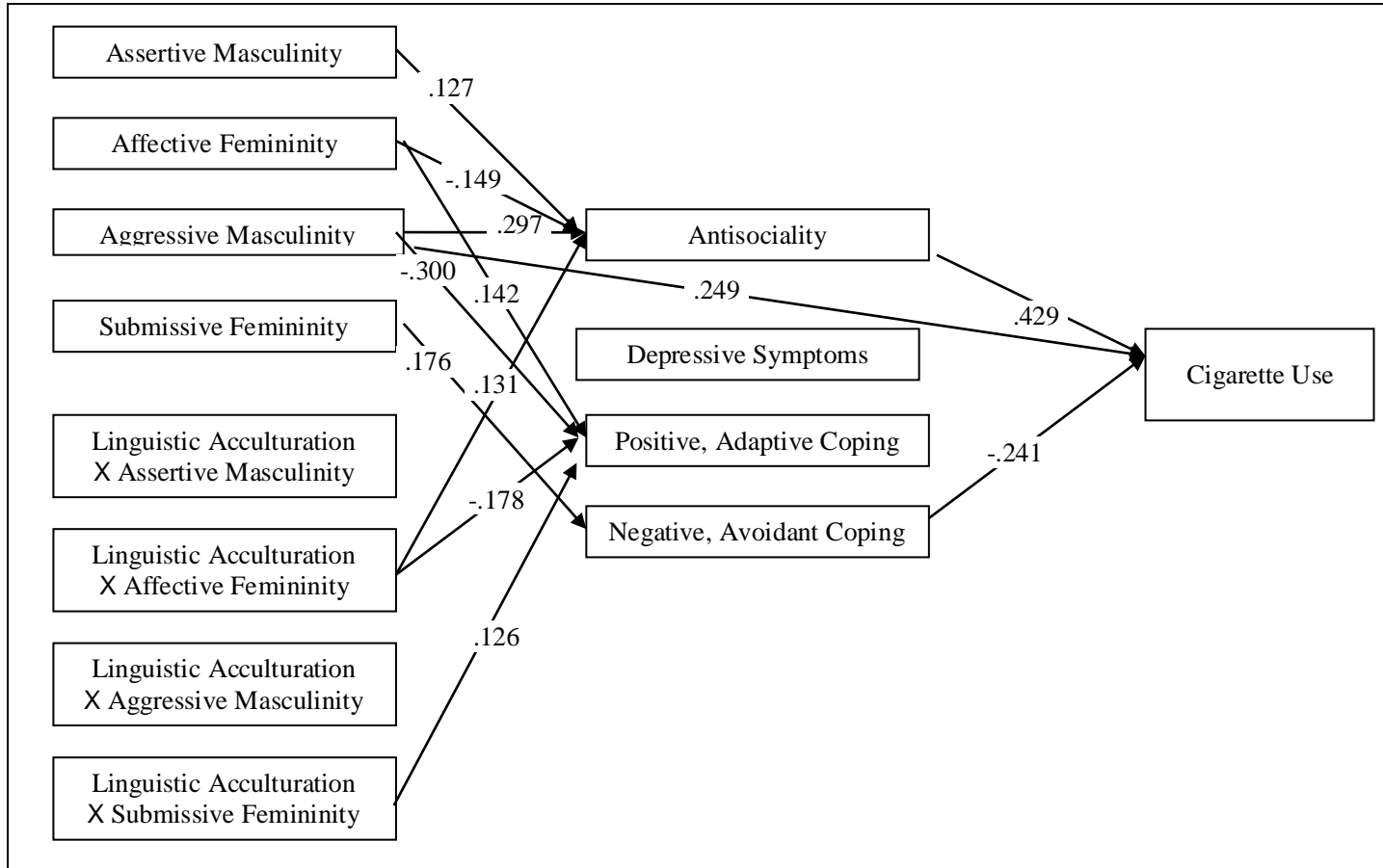


Figure Caption

Figure 13. Significant paths of full model from gender roles to marijuana use for boys. The direct and indirect paths from linguistic acculturation to marijuana use were all non-significant and are not shown. R^2 : marijuana use .245, antisociality .113, depressive symptoms .055, adaptive coping .142, avoidant coping .061.

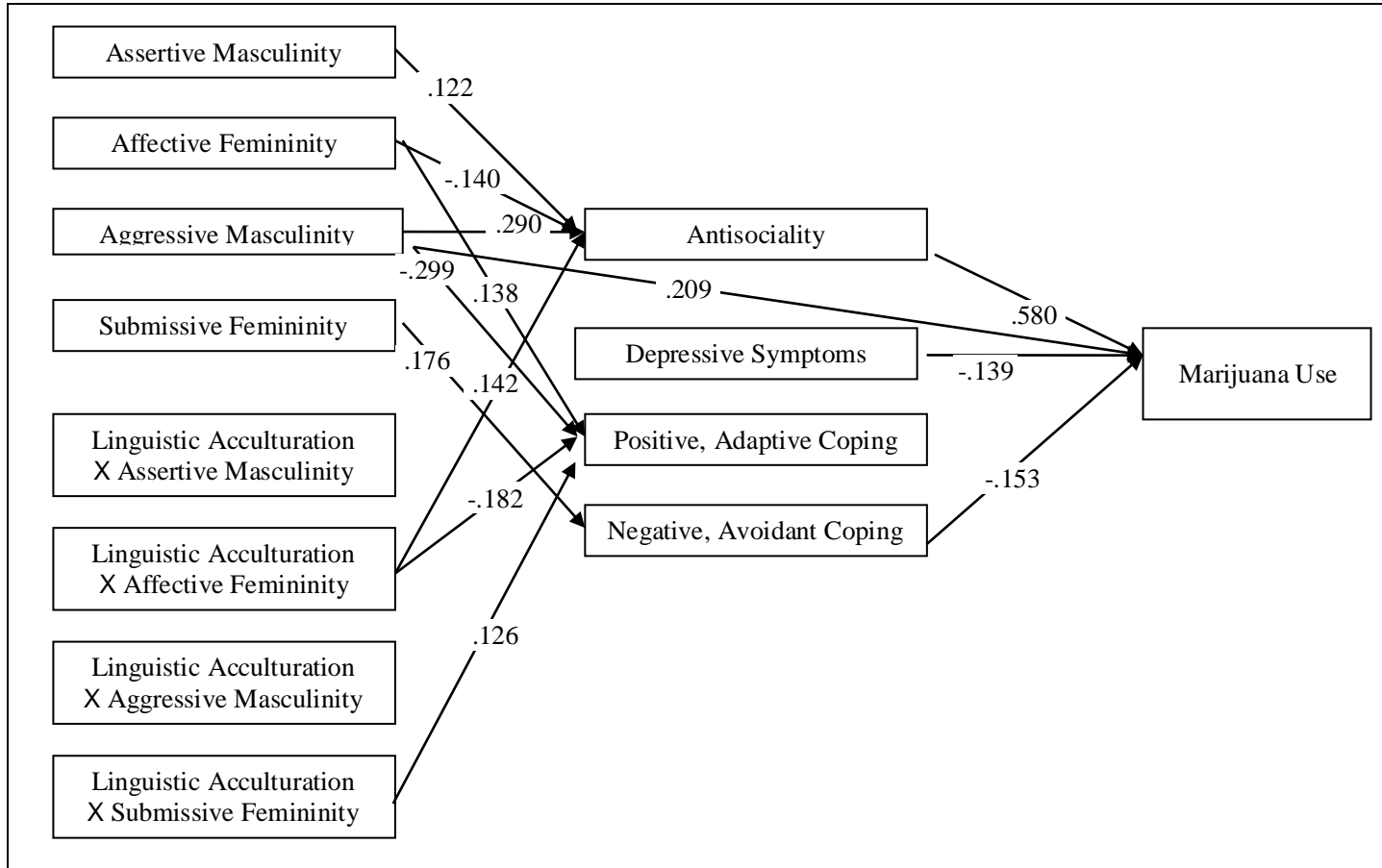


Figure Caption

Figure 14. Significant paths of full model from gender roles to alcohol use for girls. The direct and indirect paths from linguistic acculturation to alcohol use were all non-significant and are not shown. R^2 : alcohol use .113, antisociality .046, depressive symptoms .088, adaptive coping .106, avoidant coping .084.

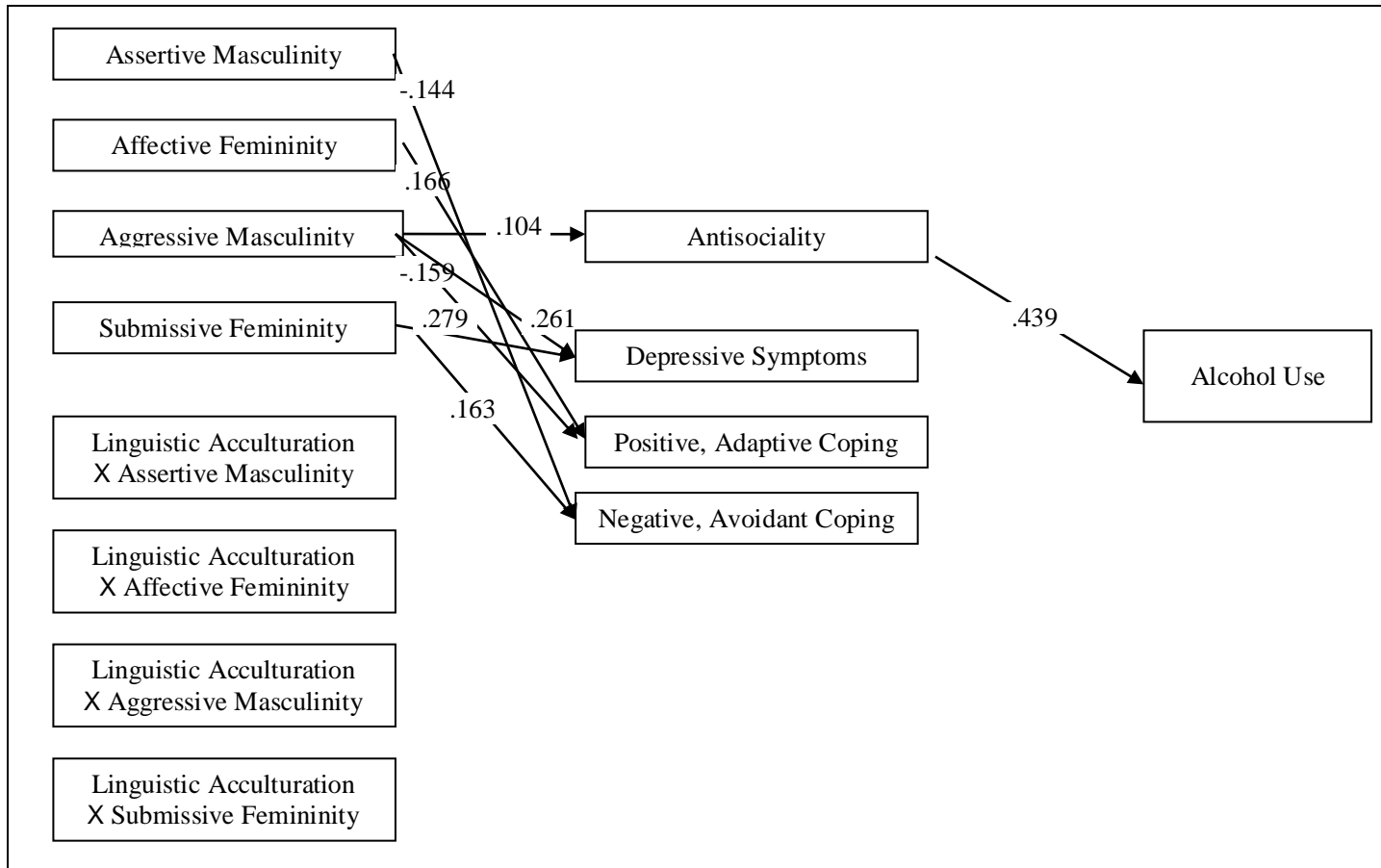


Figure Caption

Figure 15. Significant paths of full model from gender roles to cigarette use for girls. The direct and indirect paths from linguistic acculturation to cigarette use were all non-significant and are not shown. R^2 : cigarette use .048, antisociality .047, depressive symptoms .088, adaptive coping .106, avoidant coping .085.

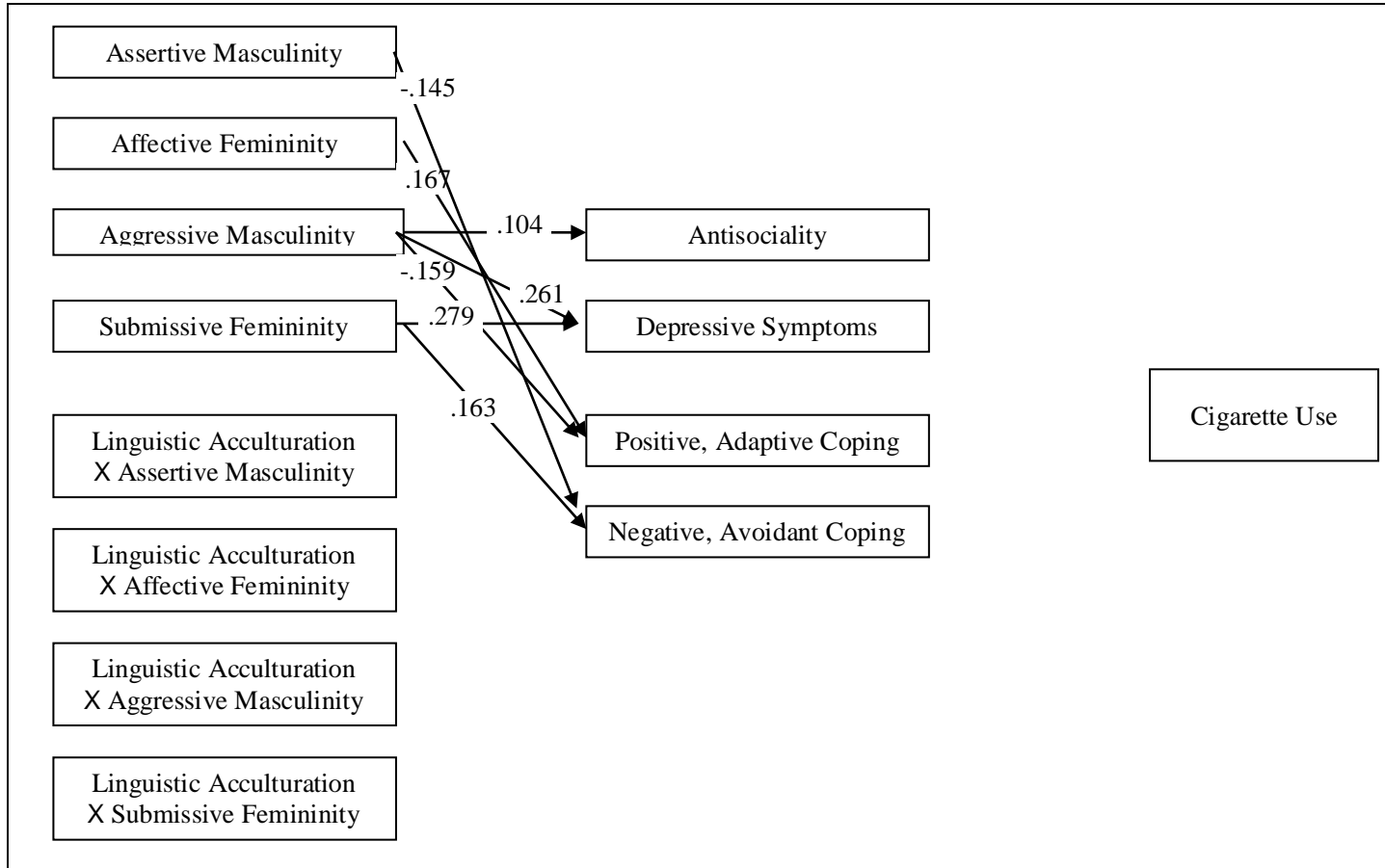


Figure Caption

Figure 16. Significant paths of full model from gender roles to marijuana use for girls. The direct and indirect paths from linguistic acculturation to marijuana use were all non-significant and are not shown. R^2 : marijuana use .136, antisociality .047, depressive symptoms .088, adaptive coping .106, avoidant coping .084.

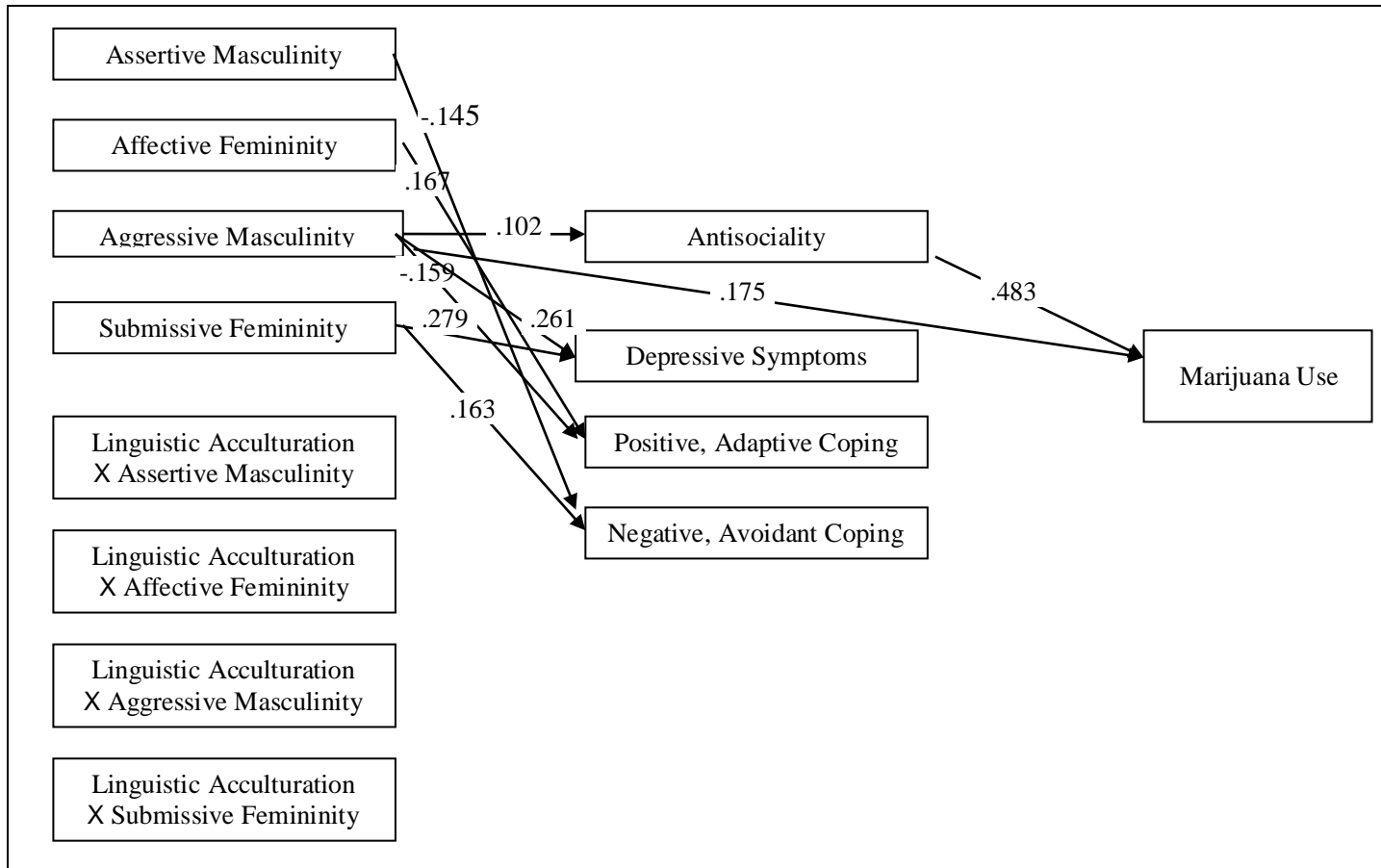


Figure Caption

Figure 17. Acculturation by affective femininity interaction on antisociality for boys.

Acculturation by Affective Femininity Interaction on Antisociality

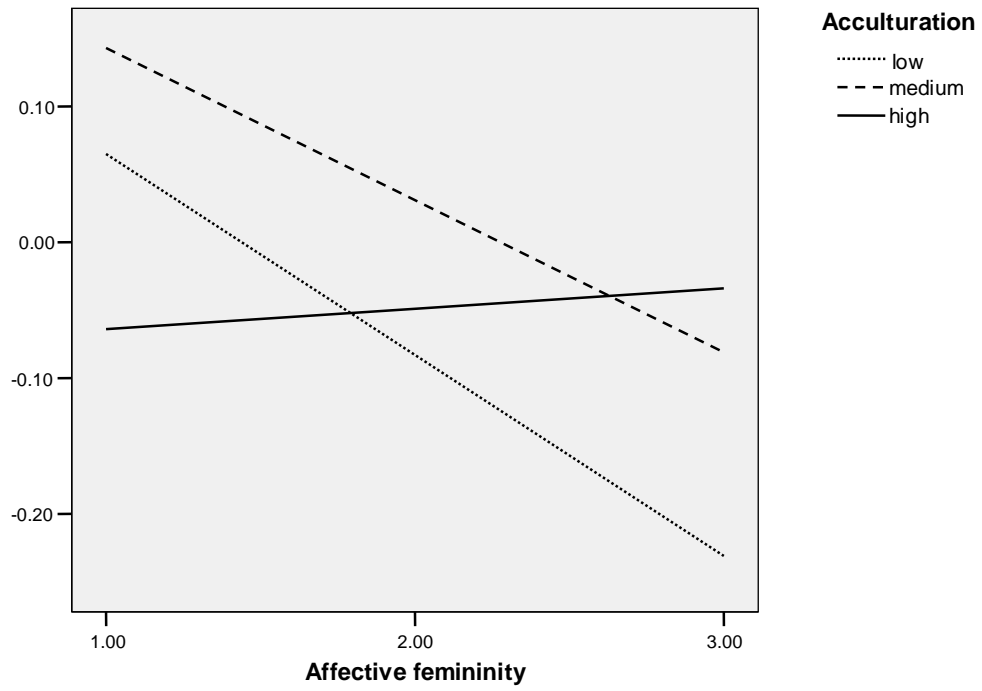


Figure Caption

Figure 18. Acculturation by affective femininity interaction on adaptive coping for boys.

Acculturation by Affective Femininity Interaction on Adaptive Coping

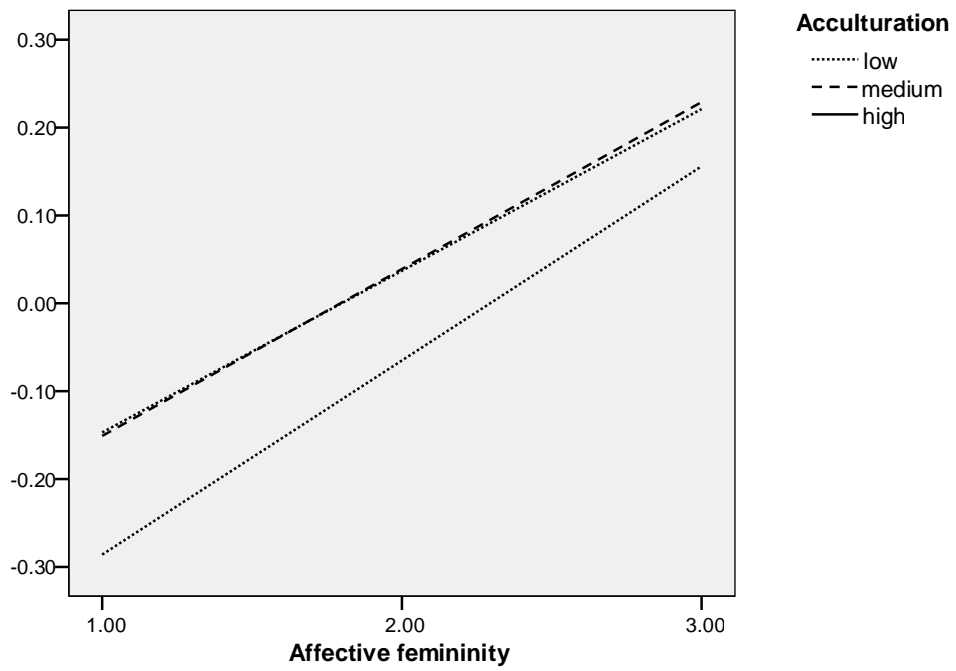
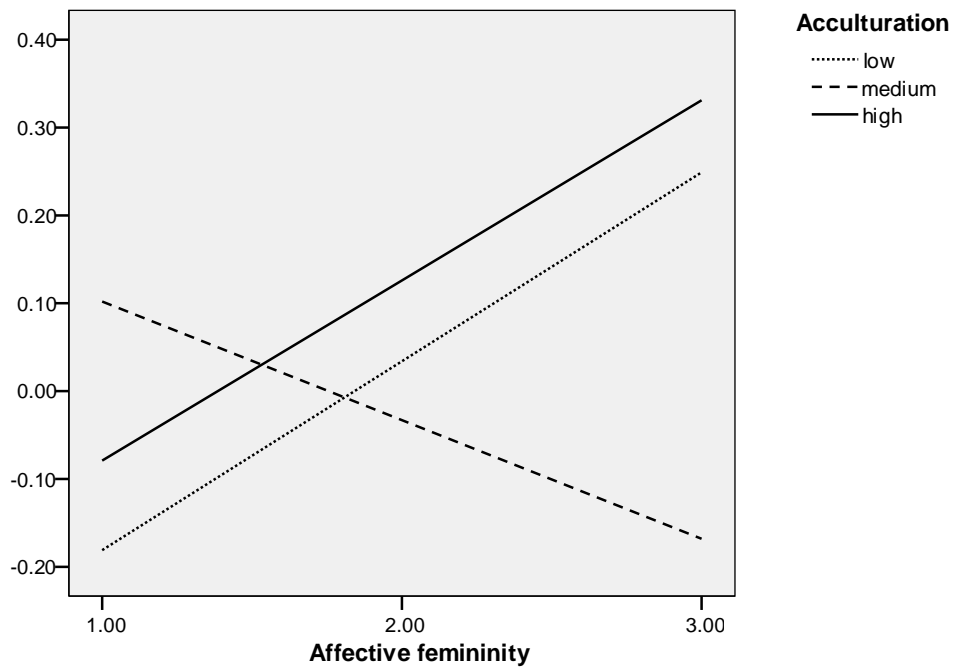


Figure Caption

Figure 19. Acculturation by submissive femininity interaction on adaptive coping for boys.

Acculturation by Submissive Femininity Interaction on Adaptive Coping



Appendix

Table A *Standardized Path Coefficients for Gender Roles and Mediators on Alcohol Use for Boys*

Gender Role	Mediator	Gender Role Effect on Mediator	Mediator Effect on Outcome	Mediated Effect estimate, p value, [95% C.I.]
Assertive masculinity	Antisociality	.113	.425***	.048, p < .05, .002, .127
Assertive masculinity	Depressive Symptoms	.086	-.056	-.005, n.s., -.032, .003
Assertive masculinity	Adaptive Coping	.121	.090	.011, n.s., -.001, .043
Assertive masculinity	Avoidant Coping	-.096	-.140*	.013, p < .05, .000, .043
Affective Femininity	Antisociality	-.138*	.425***	-.058, p < .05, -.147, -.007
Affective Femininity	Depressive Symptoms	.112	-.056	-.006, n.s., -.040, .003
Affective Femininity	Adaptive Coping	.116	.090	.010, n.s., -.002, .041
Affective Femininity	Avoidant Coping	-.077	-.140*	.011, n.s., -.001, .047
Aggressive Masculinity	Antisociality	.314***	.425***	.133, p < .01, .037, .277
Aggressive Masculinity	Depressive Symptoms	.153	-.056	-.009, n.s., -.045, .003
Aggressive Masculinity	Adaptive Coping	-.312***	.090	-.028, n.s., -.080, .006
Aggressive Masculinity	Avoidant Coping	.095	-.140*	-.013, n.s., -.053, .001
Submissive Femininity	Antisociality	-.156	.425***	-.066, n.s., -.199, .011
Submissive Femininity	Depressive Symptoms	-.080	-.056	.005, n.s., -.005, .036
Submissive Femininity	Adaptive Coping	.082	.090	.007, n.s., -.003, .038
Submissive Femininity	Avoidant Coping	.177*	-.140*	-.025, p < .05, -.077, -.003

* p < .05 ** p < .01 *** p < .001

Table B *Standardized Path Coefficients for Gender Roles and Mediators on Cigarette Use for Boys*

Gender Role	Mediator	Gender Role Effect on Mediator	Mediator Effect on Outcome	Mediated Effect estimate, p value, [95% C.I.]
Assertive masculinity	Antisociality	.112	.424**	.047, p < .05, .001, .151
Assertive masculinity	Depressive Symptoms	.086	-.017	-.001, n.s., -.030, .005
Assertive masculinity	Adaptive Coping	.120	-.071	-.008, n.s., -.035, .004
Assertive masculinity	Avoidant Coping	-.098	-.186*	.018, p < .05, .000, .057
Affective Femininity	Antisociality	-.136*	.424***	-.058, p < .05, -.158, -.008
Affective Femininity	Depressive Symptoms	.112	-.017	-.002, n.s., -.032, .006
Affective Femininity	Adaptive Coping	.117	-.071	-.008, n.s., -.043, .004
Affective Femininity	Avoidant Coping	-.078	-.186*	.014, n.s., -.002, .064
Aggressive Masculinity	Antisociality	.314***	.424***	.133, p < .01, .021, .318
Aggressive Masculinity	Depressive Symptoms	.153	-.017	-.003, n.s., -.039, .009
Aggressive Masculinity	Adaptive Coping	-.307***	-.071	.022, n.s., -.014, .069
Aggressive Masculinity	Avoidant Coping	.097	-.186*	-.018, n.s., -.068, .001
Submissive Femininity	Antisociality	-.150	.424***	-.063, n.s., -.230, .007
Submissive Femininity	Depressive Symptoms	-.080	-.017	.001, n.s., -.006, .033
Submissive Femininity	Adaptive Coping	.078	-.071	-.006, n.s., -.037, .003
Submissive Femininity	Avoidant Coping	.176*	-.186*	-.033, p < .05, -.094, -.004

* p < .05 ** p < .01 *** p < .001

Table C *Standardized Path Coefficients for Gender Roles and Mediators on Marijuana Use for Boys*

Gender Role	Mediator	Gender Role Effect on Mediator	Mediator Effect on Outcome	Mediated Effect estimate, p value, [95% C.I.]
Assertive masculinity	Antisociality	.106	.574***	.061, n.s., -.002, .168
Assertive masculinity	Depressive Symptoms	.086	-.138**	-.012, n.s., -.050, .009
Assertive masculinity	Adaptive Coping	.122*	-.053	-.006, n.s., -.033, .007
Assertive masculinity	Avoidant Coping	-.097	-.152*	.015, p < .05, .001, .048
Affective Femininity	Antisociality	-.128	.574***	-.073, p < .05, -.177, -.007
Affective Femininity	Depressive Symptoms	.112	-.138**	-.015, n.s., -.057, .006
Affective Femininity	Adaptive Coping	.113	-.053	-.006, n.s., -.034, .006
Affective Femininity	Avoidant Coping	-.079	-.152*	.012, n.s., -.002, .051
Aggressive Masculinity	Antisociality	.308***	.574***	.177, p < .01, .059, .353
Aggressive Masculinity	Depressive Symptoms	.153	-.138**	-.021, n.s., -.072, .002
Aggressive Masculinity	Adaptive Coping	-.306***	-.053	.016, n.s., -.021, .058
Aggressive Masculinity	Avoidant Coping	.097	-.152*	-.015, n.s., -.060, .000
Submissive Femininity	Antisociality	-.154	.574***	-.088, n.s., -.259, .018
Submissive Femininity	Depressive Symptoms	-.080	-.138**	.011, n.s., -.014, .056
Submissive Femininity	Adaptive Coping	.078	-.053	-.004, n.s., -.028, .004
Submissive Femininity	Avoidant Coping	.176*	-.152*	-.027, p < .05, -.075, -.004

* p < .05 ** p < .01 *** p < .001

Table D *Standardized Path Coefficients for Gender Roles and Mediators on Alcohol Use for Girls*

Gender Role	Mediator	Gender Role Effect on Mediator	Mediator Effect on Outcome	Mediated Effect estimate, p value, [95% C.I.]
Assertive masculinity	Antisociality	-.004	.459***	-.002, n.s., -.034, .028
Assertive masculinity	Depressive Symptoms	.026	-.011	.000, n.s., -.011, .004
Assertive masculinity	Adaptive Coping	.030	-.135*	-.004, n.s., -.025, .007
Assertive masculinity	Avoidant Coping	-.157**	-.046	.007, n.s., -.020, .037
Affective Femininity	Antisociality	-.063*	.459***	-.029, p < .05, -.072, -.004
Affective Femininity	Depressive Symptoms	-.071	-.011	.001, n.s., -.005, .017
Affective Femininity	Adaptive Coping	.145**	-.135*	-.020, p < .05, -.051, -.001
Affective Femininity	Avoidant Coping	-.041	-.046	.002, n.s., -.005, .024
Aggressive Masculinity	Antisociality	.100**	.459***	.046, p < .01, .009, .099
Aggressive Masculinity	Depressive Symptoms	.278**	-.011	-.003, n.s., -.028, .018
Aggressive Masculinity	Adaptive Coping	-.157***	-.135*	.021, p < .05, .001, .060
Aggressive Masculinity	Avoidant Coping	.041	-.046	-.002, n.s., -.053, .001
Submissive Femininity	Antisociality	.040	.459***	.018, n.s., -.014, .059
Submissive Femininity	Depressive Symptoms	.280	-.011	-.003, n.s., -.029, .016
Submissive Femininity	Adaptive Coping	-.057	-.135*	.008, n.s., -.003, .031
Submissive Femininity	Avoidant Coping	.173***	-.046	-.008, n.s., -.042, .021

* p < .05 ** p < .01 *** p < .001

Table E *Standardized Path Coefficients for Gender Roles and Mediators on Cigarette Use for Girls*

Gender Role	Mediator	Gender Role Effect on Mediator	Mediator Effect on Outcome	Mediated Effect estimate, p value, [95% C.I.]
Assertive masculinity	Antisociality	-.004	.171	-.001, n.s., -.018, .010
Assertive masculinity	Depressive Symptoms	.026	.029	.001, n.s., -.003, .016
Assertive masculinity	Adaptive Coping	.030	-.131	-.004, n.s., -.026, .008
Assertive masculinity	Avoidant Coping	-.157**	-.063	.010, n.s., -.009, .035
Affective Femininity	Antisociality	-.067*	.171	-.011, p < .05, -.033, -.002
Affective Femininity	Depressive Symptoms	-.071	.029	-.002, n.s., -.029, .002
Affective Femininity	Adaptive Coping	.147**	-.131	-.019, p < .05, -.052, -.001
Affective Femininity	Avoidant Coping	-.041	-.063	.003, n.s., -.003, .027
Aggressive Masculinity	Antisociality	.099**	.171	.017, p < .05, .003, .050
Aggressive Masculinity	Depressive Symptoms	.278**	.029	.008, n.s., -.007, .041
Aggressive Masculinity	Adaptive Coping	-.156***	-.131	.020, p < .05, .000, .055
Aggressive Masculinity	Avoidant Coping	.041	-.063	-.003, n.s., -.021, .003
Submissive Femininity	Antisociality	.042	.171	.007, n.s., -.004, .031
Submissive Femininity	Depressive Symptoms	.280*	.029	.008, n.s., -.006, .037
Submissive Femininity	Adaptive Coping	-.059	-.131	.008, n.s., -.004, .031
Submissive Femininity	Avoidant Coping	.173***	-.063	-.011, n.s., -.041, .009

* p < .05 ** p < .01 *** p < .001

Table F *Standardized Path Coefficients for Gender Roles and Mediators on Marijuana Use for Girls*

Gender Role	Mediator	Gender Role Effect on Mediator	Mediator Effect on Outcome	Mediated Effect estimate, p value, [95% C.I.]
Assertive masculinity	Antisociality	-.008	.492**	-.004, n.s., -.041, .026
Assertive masculinity	Depressive Symptoms	.026	-.011	.000, n.s., -.014, .004
Assertive masculinity	Adaptive Coping	.030	-.042	-.001, n.s., -.017, .003
Assertive masculinity	Avoidant Coping	-.157**	-.023	.004, n.s., -.022, .030
Affective Femininity	Antisociality	-.067*	.492**	-.033, p < .05, -.090, -.007
Affective Femininity	Depressive Symptoms	-.071	-.011	.001, n.s., -.004, .020
Affective Femininity	Adaptive Coping	.146**	-.042	-.006, n.s., -.028, .008
Affective Femininity	Avoidant Coping	-.041	-.023	.001, n.s., -.005, .017
Aggressive Masculinity	Antisociality	.099**	.492**	.048, p < .01, .010, .120
Aggressive Masculinity	Depressive Symptoms	.278**	-.011	-.003, n.s., -.029, .016
Aggressive Masculinity	Adaptive Coping	-.156***	-.042	.007, n.s., -.008, .030
Aggressive Masculinity	Avoidant Coping	.041	-.023	-.001, n.s., -.016, .006
Submissive Femininity	Antisociality	.041	.492**	.020, n.s., -.013, .069
Submissive Femininity	Depressive Symptoms	.280*	-.011	-.003, n.s., -.034, .015
Submissive Femininity	Adaptive Coping	-.059	-.042	.002, n.s., -.003, .020
Submissive Femininity	Avoidant Coping	.173***	-.023	-.004, n.s., -.032, .022

* p < .05 ** p < .01 *** p < .001