A LONGITUDINAL EXAMINATION
OF THE MODERATING IMPACT OF FAMILY AND PEER FACTORS
ON THE RELATIONSHIP BETWEEN
ANXIETY AND ALCOHOL USE DURING ADOLESCENCE

by

Juliet Rogers Bradley

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Human Development and Family Studies

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ABSTRACT

Research indicates that anxiety and alcohol use are present during adolescence, and are often stable over time. Studies also have found a relationship between anxiety and alcohol use in adolescents, and family and peer factors have been found to buffer adolescents from these two constructs. However, studies have not examined the ways in which family and peer factors moderate the relationship between anxiety and alcohol use in adolescents, and a paucity of studies have explored the impact of gender and race. Utilizing three theories, The Ecological Risk/Protective Theory, The Interactional Theory of Delinquency, and the Stress-Buffering Hypothesis, this study examined the stability of anxiety and alcohol use over time, the bidirectional relationship between anxiety and alcohol use, and whether family (parental communication, family satisfaction, parental limit setting) and/or peer factors (social support from a close friend, social competence) moderate the relationship between anxiety and alcohol use. The impact of gender and race was also investigated. Data for this dissertation were drawn from a five year longitudinal study, The Adolescent Adjustment Project. This study used data collected in Waves 2 and 3 from a sample of 559 Caucasian, African American, and Hispanic adolescents. Results from a correlation matrix and hierarchical regression analyses indicated that anxiety remained stable for the overall sample, both genders, and all three races, alcohol use remained stable for the overall sample, boys, and Caucasians, there was a relationship between anxiety and alcohol use in boys, and parental limit setting predicted future alcohol use in boys. There were no family and peer factors that

moderated the relationship between anxiety and alcohol use. Practitioners working with adolescents need to consider the impact of gender and race on anxiety and alcohol use, and future research should continue to explore the moderating impact of family and peer factors on the relationship between these constructs.

Chapter 1

INTRODUCTION

Adolescence, Anxiety, and Alcohol Use

The developmental stage of adolescence is filled with numerous changes related to cognition, puberty, family and peer relationships, and school transitions (Spear, 2000; Spear & Kulbok, 2004; Steinberg & Morris, 2001). Although there are numerous changes that occur, most adolescents pass through this developmental stage without any difficulty (Cicchetti & Rogosch, 2002; Spear, 2000). Lerner and Galambos (1998) agreed with this notion, and stated that most individuals have the personal and emotional resources necessary to help them move through adolescence without any dysfunction. As indicated by Cicchetti and Rogosch (2002), one of the components related to an adolescent's ability to successfully navigate this developmental stage is the number of resources that they have to assist them. The authors stated that if adolescents have positive resources to depend on during this stage of development, it will help them have a higher level of resiliency which will enable them to handle situations more effectively.

Related to this, although previous research has indicated that adolescence can be a time of great conflict between parents and adolescents, more recent findings have revealed that the majority of relationships between adolescents and their parents are healthy rather than dysfunctional (Steinberg, 2001). Montemayor (1986) stated that in most families, there is limited conflict between adolescents and their parents the majority of the time, and the conflict that does occur is normative conflict that occurs

as a result of the existence of an interpersonal relationship (Montemayor, 1983). Smetana (1989) confirmed this notion and found in her study with 102 fifth through twelfth graders that conflict between adolescents and their parents occurred as a result of everyday events such as chores.

Taken together, the studies indicated that although there are changes that occur, most individuals are able to navigate the developmental stage of adolescence effectively, especially if resources are available to help the adolescent adapt to the presence of new situations. In addition, some conflict among parents and adolescents is normative, with research negating the original thought that adolescent/parent relationships in this stage were full of conflict. Instead, adolescents were found to have normal levels of conflict that would be expected in an interpersonal relationship.

Whereas the majority of adolescents move through this developmental stage without any difficulty, some are prone to developing internalizing disorders such as anxiety, or externalizing disorders such as alcohol use. Anxiety is a common occurrence among adolescents, but has not been as widely studied as depression in this population (Essau, Conradt, and Petermann, 2000). Externalizing disorders, such as alcohol use, are also found among adolescents, and experimentation with alcohol is quite common and normative among this population (Lerner & Galambos, 1998), with alcohol use increasing as adolescents get older (Johnston, Bachman, & Schulenberg, 2009).

Stability in Anxiety and Alcohol Use Over Time

Anxiety. Adolescents may be prone to internalizing disorders such as anxiety due to the plethora of changes that occur in this developmental stage, including

a movement toward autonomy from family and developing stronger relationships with peers (Spear, 2000; Tarter, 2002). Studies on anxiety have found that this internalizing behavior increases as children move into adolescence due in part to an increase in cognitive functions, such as the capacity for abstract thought (Steinberg & Morris, 2001). Some adolescents may also develop anxiety because adolescence is a stage of development where individuals begin to take on new roles in their families, and start to become more autonomous (Spear & Kulbok, 2004).

In addition to adolescents being more prone to anxiety than children, numerous studies also have indicated that anxiety in one time point is likely to predict future anxiety (Gullone, King, & Ollendick, 2001; Orvaschel, Lewinsohn, & Seeley, 1995). Some studies also have indicated that there are gender differences where anxiety in one time point has been found to be more likely to predict future anxiety in girls versus boys (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Ferdinand, Dielman, Ormel, & Verhulst, 2007). Thus, although research has found anxiety to increase over time (Steinberg & Morris, 2001), it is also found that if anxiety is present in one time point, it is more likely to continue to be present in future time points (Costello et al., 2003). Despite the studies that have examined gender differences related to anxiety over time in adolescents, there has been a dearth of studies looking at the impact of race on anxiety over time. Thus, examining anxiety over time by gender and race will assist with increasing the already existing research on this topic. Besides anxiety changing during adolescence, and being studied over time, the changing nature of alcohol use in this population also has been examined in various studies.

Alcohol Use. It has been indicated that alcohol use increases as adolescents gets older (Johnston, et al., 2009). One of the reasons that has been found to explain this is that peers assert a greater influence adolescents versus children, and peer influence has been found to be related to alcohol use (Cardenal & Adell, 2000; Gardner & Steinberg, 2005). In addition to alcohol use being higher in adolescents, some studies also have found that alcohol use in one time point predicts future alcohol use (Orvaschel et al., 1995; Steinhausen, Eschmann, & Metzke, 2007). Numerous studies have indicated that alcohol use in one time point predicts future alcohol use for both boys and girls, and significant differences with regard to gender are typically not found (Blozis, Feldman, & Conger, 2007; Koppes, Kemper, Post, Snel, & Twisk, 2000; Toumbourou, Williams, Snow, & White, 2003). A study by Shillington and Clapp (2000) also no significant racial differences with regard to alcohol use in one time point predicting future alcohol use. Replicating studies that have been conducted on alcohol use over time in adolescents is important in order to ascertain the similarities and differences that may exist with regard to current research. As anxiety and alcohol use have been found to change over time, a relationship between these two constructs also has been examined.

Relationship Between Anxiety and Alcohol Use

Various studies have indicated an association between anxiety and alcohol use in adolescents wherein the presence of anxiety is related to higher alcohol use (Lewinsohn, Zinbarg, Seeley, Lewinsohn, & Sack, 1997; Low, Lee, Johnson, Williams, & Harris, 2008). Despite these studies, there is a dearth of research that has examined the impact of gender or race on the association between anxiety and alcohol use. Research has examined the impact of gender and race on anxiety and alcohol use

separately, but little exists focusing on the association between these variables. In the studies, gender differences have been found with regard to anxiety and alcohol use (Cardenal & Adell, 2000; Husler & Plancherel, 2006; van Brakel, Muris, Bogels, & Thomassen, 2006). Racial differences also have been found with regard to anxiety (Chapman & Woodruff-Borden, 2009; Way & Chen, 2000) and alcohol use (Getz & Bray, 2005; Stewart & Power, 2003) in adolescents, with anxiety not as widely studied among minorities (Safren, Gonzales, Horner, Leung, Heimberg, & Juster, 2000). Furthermore, of the studies that have examined minorities and anxiety, most have examined the African American population (Safren et al., 2000).

Thus, although studies may have examined the impact of gender and race on anxiety and alcohol use separately, using these characteristics to examine the association between these variables would help extend the studies. In addition, looking at adolescents who are not just Caucasian and African American, but also Hispanic will also help bridge some of the gaps in the studies that have not looked as much at this population. Whereas a relationship between anxiety and alcohol use has been found in some studies with adolescents, studies also have investigated the temporal relationship between these constructs.

Temporal Relationship Between Anxiety and Alcohol Use

The temporal relationship between anxiety and alcohol use has been studied, with the literature indicating that anxiety precedes alcohol use in adolescents in the majority of situations (Rohde, Lewinsohn, & Seeley, 1996; Zimmermann, Wittchen, Hofler, Pfister, Kesler, & Lieb, 2003). A study by Sung, Erkanli, Angold, and Costello (2004) also found gender specific results in that girls who had higher levels of anxiety were at a greater risk for alcohol use in later years. Few studies exist

that have investigated the impact of race on the temporal relationship between anxiety and alcohol use. Thus, it would be useful to attempt to replicate previous studies that have examined the temporal relationship between these constructs in order to assess similarities or differences related to findings in the already existing research, and to examine the impact of race. Whereas a relationship between anxiety and alcohol use has been indicated in numerous studies, there also has been research conducted examining the impact of familial and peer risk and protective factors on this relationship.

Risk and Protective Influences of Family and Peers

In the past, most research has concentrated on examining risk factors associated with anxiety and alcohol use in adolescents. Research has found that factors within family and peer relationships can put adolescents at risk for anxiety or harmful alcohol use (Piko & Kovacs, 2010; Vulic-Prtoric & Macuka, 2006). Family characteristics such as low parental warmth (Bogels, van Oosten, Muris, & Smulders, 2001; Vulic-Prtoric & Macuka, 2006), rejection (Hale, Engles, & Meeus, 2006), and higher levels of family conflict (McShane, Walter, & Rey, 2001) have been associated with anxiety in adolescents. Higher levels of family conflict (Bray, Adams, Getz, & Baer, 2001) as well as other family characteristics such as low levels of parental monitoring (Li, Feigelman, & Stanton, 2000) and family support (Windle & Mason, 2004) also have been found to be risk factors for the development of problematic alcohol use in adolescents. Moreover, peer characteristics such as peer encouragement (Windle & Mason, 2004), and cliques (Hussong, 2002) have been identified as risk factors with regard to alcohol use, whereas peer crowd affiliation (Prinstein & La

Greca, 2002) , and less friendship support (La Greca & Lopez, 1998) have been found to be related to the development of anxiety.

Gender and racial differences also have been identified with regard to risk factors related to the impact of family and peer relationships on anxiety and alcohol use (Gaughan, 2006; Rose & Rudolph, 2006; Smetana, Campione-Barr, & Metzger, 2006; Wallace & Muroff, 2002). Girls may be more impacted by family risk factors, such as low parental monitoring, when examining alcohol use (Rose, Dick, Viken, Pulkkinen, & Kaprio, 2001). Furthermore, girls may be more concerned with fitting in and with peer relationships, which could put them at greater risk of developing anxiety or using substances such as alcohol (Husler & Plancherel, 2006; Rose & Rudolph, 2006). It is also found that racial differences, such as the fact that parents of Caucasian adolescents are more tolerant of alcohol use, may influence the higher levels of alcohol use in these adolescents than individuals of other races (Catalano, Morrison, Wells, & Gillmore, 1992). African American adolescents also have been found to be less influenced by peers than adolescents of other races with regard to alcohol use, thus adolescents of other races may be at a higher risk of using alcohol due to peer influence (Strunin, 1999).

Protective Family Influences. Although risk factors related to family and peer relationships have been identified with regard to anxiety and alcohol use, there has been a movement in the research to examine the way in which these relationships can help protect adolescents from developing anxiety or becoming involved with harmful alcohol use (Oman, Vesely, Aspy, McLeroy, Rodine, & Marshall, 2004). As a result of this movement, protective family and peer factors have been explored that act to buffer adolescents from anxiety or alcohol use. Although more studies have

examined family protective factors with regard to alcohol use (Piko, 2000), some have examined characteristics with regard to anxiety. Warmth, attachment (Wolfradt, Hempel, & Miles, 2003), and family support (Guerrero, Hishinuma, Andrade, Nishimura, & Cunanan, 2006) are family characteristics that have been found to protect adolescents from anxiety and other internalizing behaviors. Family support (Piko & Kovacs, 2010) also has been found to act as a buffer with regard to alcohol use in adolescents, as has parental monitoring (Webb, Bray, Getz, & Adams, 2002), and family cohesion (Husler, Blakeney, & Werlen, 2005).

Although studies have found these family characteristics to act as a buffer with regard to anxiety and alcohol use, the buffering effects on these constructs have been examined separately. Thus, using family characteristics to examine the relationship between anxiety and alcohol use will extend findings in research on protective influences of family. Furthermore, there have been some common family characteristics, such as parental monitoring and support (Kuendig & Kuntsche, 2006; Schinke, Fang, & Cole, 2008), that have been examined as protective mechanisms, whereas other family characteristics such as parental communication with mother and father, family satisfaction, and limit setting have not been as widely investigated (Clark & Shields, 1997; Silmere & Stiffman, 2006; Wu, Lu, Sterling, & Weisner, 2004). Thus, using these family variables to examine the association between anxiety and alcohol use will further extend findings on familial protective influences.

Protective Peer Influences. Research also has examined the protective influence of peer relationships related to anxiety and other internalizing behaviors, and alcohol use in adolescents. Some studies have found inverse relationships between anxiety and friendship in adolescents (La Greca & Harrison, 2005; Procidano &

Heller, 1983). Other research has investigated more specific peer friendship characteristics such as peer support, trust, and positive reinforcement, and found inverse relationships to depression (Hussong & Hicks, 2003; Way & Chen, 2000). With regard to alcohol use, studies have examined the impact of prosocial peers, peer support, and positive peer relationships as buffers to this externalizing behavior in adolescents (Oman, et al., 2004; Scholte, van Lieshout, & van Aken, 2001).

Although these peer characteristics have been examined as protective influences with regard to anxiety and alcohol use separately, similar to the family studies, the peer studies have failed to examine how different peer characteristics may protect adolescents with regard to the association between anxiety and alcohol use. Thus, this dissertation will attempt to fill this gap by examining peer characteristics, namely social support from a close friend and social competence, to investigate whether these things act as protective mechanisms in the association between anxiety and alcohol use. These peer characteristics were chosen as although peer support has been examined in studies, many studies have looked at support from numerous peers (Chester, Jones, Zalot, & Sterrett, 2007) instead of from one close friend. The authors attributed this to the possibility that adolescents with numerous peer relationships may have a greater sense of belonging, which in turn may protect them from internalizing or externalizing behaviors. As research has indicated that support from one close friend can also protect adolescents (Bishop & Inderbitzen, 1995), it was decided that this would be an effective peer characteristic to use. Social competence was chosen as the other peer characteristics as it has been found to act as a protective mechanism, but has not been as widely used to examine internalizing behaviors such as anxiety (Simons-Morton, 2002). Thus, using these two peer characteristics to examine the

relationship between anxiety and alcohol use will fill many gaps in the studies on peer protective factors.

Differences Related to Gender and Race. Gender and racial differences have been indicated with regard to protective factors for anxiety and other internalizing behaviors, as well as alcohol use in adolescents (Scholte et al., 2001; Way & Chen, 2000). However, research seems to be lacking with regard to gender and racial differences related to family and peer protective factors in the relationship between anxiety and alcohol use. As gender differences have been found when examining family and peer protective influences on these constructs separately, it would be beneficial to also investigate whether there are any differences when looking at the association between different types of anxiety and alcohol use.

Taking all of these components together, this dissertation will attempt to fill gaps in the studies by examining the nature of the association between anxiety and alcohol use in adolescents. In addition, the family characteristics, parental communication with mother and father, family satisfaction, and parental limit setting will be investigated with regard to whether they buffer the association between anxiety and alcohol use. The family characteristic, parental limit setting, will address what parents allow adolescents to do such as date members of the opposite sex, ride in a car with friends, and be left home alone. Finally, peer characteristics, namely social support from a close friend and social competence, will also be examined with regard to protective influences they may exert on this association. Gender and racial differences will be investigated related to all of these different components.

Theoretical Underpinnings

As this dissertation will be looking at protective mechanisms from multiple levels of support, three theories will be utilized to guide this work, the Ecological Risk/Protective Theory developed by Bogenschneider (1996), the Stress-Buffering Hypothesis which was initially introduced by Cassel and Cobb in 1976, and the Interactional Theory of Delinquency, developed by Thornberry (1987, 2002). Although there is some overlap in these theories, using all of them together serves to more comprehensively guide the purpose of this dissertation.

The Ecological Risk/Protective Theory. Bogenschneider's Ecological Risk/Protective Theory (ERPT) was originally created as a way to guide the development of prevention programs, community efforts, and policies to help youth (Bogenschneider, 1996). ERPT combines the theories of Bronfenbrenner and Lerner to create a theory based on the risk and protective factors that impact youth (Bogenschneider, 1996). Bronfenbrenner's ecological theory of human development is based on the concept that there are different systems in society that interact to impact a person's behavior (Bronfenbrenner, 1989). Five systems are identified in Bronfenbrenner's theory, including the microsystem, mesosystem, exosystem, macrosystem, and the chronosystem (Bronfenbrenner, 1979, 1989). The microsystem looks at individual influences from the immediate environment like family, school, or peers, whereas the mesosystem looks at connections between these environments (Bronfenbrenner, 1979). The exosystem refers to environments in which individuals are indirectly impacted, such as children being influenced by their parent's work environment (Bronfenbrenner, 1979, 1989). Finally, the macrosystem refers to larger

impact of culture, the government, and the laws of society, and the chronosystem looks at the impact of time (Bronfenbrenner, 1979).

Bogenschneider's theory (Bogenschneider, 1996) integrates Bronfenbrenner's ecological theory with Lerner's theory of developmental contextualism. Lerner's theory (Lerner, 1991, 1995) emphasizes the notion that the relationships within each of these systems are reciprocal and dynamically move through time and space. Bogenschneider's theory added to these two theories the concept that risk and protective factors occur at various levels for youth. She outlined risk and protective factors at the individual, family, peer, school, work, and community levels to coincide with Bronfenbrenner's previously outlined systems (Bogenschneider, 1996).

Bogenschneider (1996) outlined two protective factors of interest that will guide this dissertation, including close relationships at the family and peer levels. Although Bogenschneider's theory was originally created to guide prevention programs for youth, it serves as an ideal mechanism with which to investigate the potential moderating effects of family and peer relationships on the association between anxiety and alcohol use in adolescents.

Interactional Theory of Delinquency. The Interactional Theory of Delinquency combines components from the Socialization Model, and the Selection Model, two Models used by Sociologists to discuss deviant behavior. Proponents of the Socialization Model state that interactions with deviant peers impact deviant behavior, whereas adherents of the Selection Model believe that associating with delinquent peers is the result of delinquent behavior (Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1994). Thornberry et al. (1994) indicated that the Interactional

Theory of Delinquency combines the Socialization and Selection Models, and proposes a reciprocal causal relationship with regard to delinquent behavior. Thus, peers impact deviant behavior, and deviant behavior impacts peers. In thinking of the purpose of this dissertation, alcohol use among adolescents can be considered to be a deviant behavior.

The Interactional Theory of Delinquency also indicates that the reasons for delinquent behavior change over time, depending on where an individual is in the course of their life. For example, parents may contribute more to deviant behavior in younger children, whereas peers may contribute more in the lives of adolescents. Regardless of whether parents or peers have the greater influence, the theory states that individuals are impacted by both of these groups. Furthermore, adolescents also impact parents and peers, thus again emphasizing the reciprocity that is inherent in this theory (Thornberry, 1997, 2002). As this dissertation examined the ways in which anxiety and alcohol use change over time, as well as the bidirectional relationship between these constructs, and the impact of family members and peers during adolescence, this theory will be effective in guiding this study.

The Stress-Buffering Hypothesis. The Stress-Buffering Hypothesis was first introduced in 1976 by John Cassel, a physician and epidemiologist, and Sidney Cobb, a psychiatrist. In a study by Cassel (1976), the Stress-Buffering Hypothesis was discussed in relation to the fact that a person's environment can influence the development of a disease state in either a positive or negative direction. People who received positive communication and feedback from persons in their environment were more likely to ward off the development of disease, whereas the reverse was found to be true (Cassel, 1976). Cobb (1976) also discussed the concept of social

support in terms of its impact on the development of physical diseases and illnesses, mental diseases and illness, and life transitions, including crises and how one adapts to change. Cobb (1976) indicated that social support took the form of people believing they are cared for, loved, esteemed, and/or valued, or feeling that they belonged to a system where there is a mutual commitment to the person's well-being. Taken together, both Cassel and Cobb believed that social support from family, peers, and the community acts as a buffer which lessens the impact of life stressors. Their work has culminated into what is now referred to as the Stress-Buffering Hypothesis. As the Stress-Buffering Hypothesis discusses the impact of a person's environment on the development of different behaviors (Cassel, 1976; Cobb, 1976), it is important to use this theory to examine the potential buffering impact of family and peer factors that will be explored in this dissertation.

Chapter 2

LITERATURE REVIEW

The following literature review outlines important characteristics related to the developmental stage of adolescence, as well as risk and protective influences of family and peers on anxiety and alcohol use in this population. This section also discusses the ways in which gender and race impact anxiety and alcohol use in this population.

The Developmental Stage of Adolescence

The developmental stage of adolescence is one of immense change and marks a life course transition as individuals move from childhood into becoming more autonomous and peer oriented. Life course transitions are marked by events and changes in roles which are embedded within the context of societal influence (Elder, 1985). Adolescents experience many cognitive and biological changes (Kuhn, 2006; Steinberg, Dahl, Keating, Kupfer, Masten, & Pine, 2006; Steinberg & Morris, 2001), as well as role changes with regard to family and peers (Spear, 2000; Spear & Kulbok, 2004; Tarter, 2002), and make important school transitions as they move into high school (Ranta, Kaltiala-Heino, Rantanen, & Marttunen, 2009). As there are numerous changes occurring during this developmental stage, it is important to investigate each of them and how they may contribute to the development of anxiety and use of alcohol in adolescents.

Cognitive and Biological Changes

Cognitive Changes. During adolescence, individuals begin to experience an increased ability to control their thought processes, including the frequency and content of what they think about (Kuhn, 2006). The prefrontal cortex begins to change and mature during this stage of development, giving adolescents the ability to develop more abstract hypothetical thinking allowing them to develop a sense of self (Steinberg & Morris, 2001). Although the prefrontal cortex begins to change and mature during this developmental stage, it is still not completely developed (Steinberg et al., 2006).

The fact that the prefrontal cortex is not completely developed in adolescents is associated with poorer impulse control (Chambers, Taylor, & Potenza, 2003), and riskier decision-making (Steinberg, 2005). Difficulties with emotional self-regulation that may be found during adolescence can also impact decision-making (Steinberg et al., 2006). Associated with this is the fact that dopamine also increases in an individual during adolescence (Spear, 2000). The increases in dopamine that occur during this stage of development increase an individual's desire for novelty (Spear, 2000).

Biological Changes. Numerous biological changes also occur during this developmental stage. Adolescence is marked by the onset of puberty, which causes individuals to rapidly change with regard to their height, weight, and body proportion (Matto & DeAnda, 2009). Puberty also causes adolescents to develop secondary sex hormones, with girls experiencing an increase in estrogen, and boys experiencing an increase in testosterone (Spear, 2000). As secondary sex hormones develop, adolescents begin to have a desire to seek out romantic partners and develop sexual

relationships (Steinberg et al., 2006). Whereas these changes are normative for the developmental stage of adolescence, they can have a negative impact on this population, such as an increase in internalizing behaviors such as depression (Hayward & Sanborn, 2002). In addition to the impact of cognitive and behavioral changes, adolescents are also impacted by changes in the relationships they have with their family.

Family Relationships: Impact on Anxiety

As stated previously, the movement toward being more autonomous and establishing an identity independent from family is normative during adolescence (Spear, 2000; Spear & Kulbok, 2004; Tarter, 2002), largely beginning in middle adolescence (Levpuscek, 2006). At the same time that adolescents are becoming more autonomous from their family, many families also grant them more decision making power within the family itself (Steinberg & Morris, 2001). Despite the fact that movement toward a more autonomous life is a positive component of development, there are at times difficulties with this transition. One of the difficulties with this aspect of development is that adolescents need to try to establish a balance between remaining connected to their families, and at the same time developing an identity more independent of them (Spear & Kulbok, 2004).

Some families experience conflict or tension (Cicchetti & Rogosch, 2002) as adolescents begin to disengage from parents, and roles within the family begin to be reestablished (Hill, Bromell, Tyson, & Flint, 2007). Adolescents may become angry with their parents (Cicchetti & Rogosch, 2002), or experience stress and difficulty (Cicchetti & Rogosch, 2002; Spear, 2000) as a result of the new responsibility they have of developing autonomy and relating to their parents in a different way. In

addition to stress and anger, adolescents may also experience anxiety related not only to the assumption of a different role within their family, but also with having to navigate life more independently. Parents of adolescents may contribute to these feelings of anger or stress if they fight against the inevitable autonomy that marks this developmental stage. Research indicates that it is vital that parents allow adolescents to develop a sense of autonomy while still maintaining some of their parental authority (Hill et al., 2007; Steinberg, 2001). If parents are unable to do this, and try to control adolescents or make them feel guilty for needing their autonomy, this could cause problems with the well being of the adolescent, such as anxiety over their role or anxiety over upsetting their parents (Freeman & Brown, 2001).

Family Relationships: Impact on Alcohol Use

Greater autonomy from one's family is a natural component of adolescence, but it may increase the opportunities that adolescents have to use alcohol because parents may not be there as frequently to monitor their behavior (Tarter, 2002). In addition, part of the autonomy from family is that some adolescents may get jobs, which also may act to increase the likelihood of alcohol use as individuals will then have the financial resources to buy alcohol (Tarter, 2002). Overall, families that show little warmth and structure, or high levels of hostility will not be as equipped to provide adolescents with what they need to navigate this developmental stage which in turn may lead to problem behaviors such as anxiety or alcohol use (Steinberg et al., 2006). Despite the difficulties some families have granting adolescents autonomy, family is still an important component of an adolescent's life, and has been found to contribute to the values and morals of an adolescent (Smetana et al., 2006). This may

prove to be quite important as adolescents start to develop relationships with friends outside of the home.

Peer Relationships: Impact on Anxiety

Developing relationships with peers outside of the home is a vital component of adolescence (Spear, 2000) marked by adolescents beginning to spend more time with their peers than with their family (Tarter, 2002). Peer relationships in adolescence are impacted by both the cognitive and biological changes that occur during this developmental period. As indicated previously, one of the cognitive changes that occurs during adolescence is that individuals begin to have the capacity for abstract thought. Due to this, as adolescents develop stronger relationships with peers, they begin to have an increased interest in social comparison (Hill et al., 2007), fitting in (Tarter, 2002) and conforming to peer norms such as those based on physical appearance (Smetana et al., 2006). The ability to evaluate oneself and how one fits in with others is complex, and as previously indicated, the prefrontal cortex, which is responsible for self-evaluation is still not fully developed (Steinberg et al., 2006). Thus, adolescents who are trying to develop a sense of themselves compared to others could have false judgments wherein they may feel that they do not fit in with their peers and society. This could lead to adolescents feeling anxious about their peer relationships, and their overall place in the world.

Peer Relationships: Impact on Alcohol Use

As indicated previously, adolescents are found to make riskier decisions, and have lower impulse control because their prefrontal cortex is not yet fully developed (Chambers et al., 2003; Steinberg, et al, 2006). Adolescents are also found

to be more likely to make emotionally charged decisions (Steinberg, 2005), and to have less control over their behavior when they are in emotionally charged situations, such as when they are with their peers (Steinberg, 2007). Couple these things with the fact that adolescents are more easily influenced by their peers than other individuals (Gardner & Steinberg, 2005; Steinberg, 2007) and one can see how adolescents may not only become involved with alcohol use, but also may not be fully aware of the implications of this type of behavior (Tarter, 2002).

The ramifications of alcohol use may be even greater during adolescence due to the aforementioned fact that there is an increase in dopamine in the brain during this stage of development (Spear, 2000). This increase in dopamine leads not only to an individual's desire to seek out novelty which may lead to alcohol use (Spear, 2000), but dopamine also increases the brain's sensitivity to alcohol (Chambers et al., 2003). Alcohol may have more of an impact on dopamine levels in the brain during adolescence causing the neurons involved with addiction to permanently change (Chambers et al., 2003). Thus, what may begin as normative experimentation with alcohol may cause greater problems with addiction due to the impact that dopamine has on the brain during this period of time.

Adolescence and School Transitions

Related to the changing nature of peer relationships during adolescence, this developmental stage is also a time of change with regard to school transitions wherein individuals have to make friends in a new environment (Spear, 2000), which has been found to make some adolescents self-conscious and anxious (Hudson & Rapee, 2000; Ranta et al., 2009). In addition, beginning in early adolescence, the expectation that individuals work in groups, answer questions in class, and give oral

presentations begins to increase (Velting & Albano, 2001). These things combined with having to make new friends in a new environment could cause anxiety in some individuals. School transitions may also impact the use of alcohol among adolescents. When adolescents begin going to high school, they become surrounded by peers who are older than themselves. As alcohol use increases as adolescents get older (Johnston et al., 2009), exposure to peers that are older may increase the chances that alcohol will be available (Tarter, 2002). Taking into account the impact of cognitive and behavioral changes, as well as the impact of change related to family relationships and school transitions, it becomes evident how adolescents may have difficulties related to internalizing and externalizing behaviors.

Adolescent Problem Behaviors

Internalizing Disorders

Internalizing disorders are described in various studies as behaviors that manifest themselves as somatic problems or conditions such as depression and anxiety (Farooqui, Hagglof, Sedin, Gothefors, & Serenius, 2007). As discussed previously, adolescents may be prone to internalizing disorders such as depression and anxiety due to the plethora of changes occurring during this developmental stage. Some anxiety during adolescence is normative (Weems, 2008). However, when anxiety begins to become stressful or causes impairment to an individual, then it crosses into becoming a problem versus being normative behavior (Weems, 2008). Studies have indicated that anxiety can be categorized as state and/or trait anxiety, in individuals, including adolescents (Endler & Kocovski, 2001; Lau, Eley, & Stevenson, 2006).

State and Trait Anxiety. The contrast between state and trait anxiety has been widely discussed (Hishinuma, Miyamoto, Nishimura, Goebert, Yuen, Makini, Andrade, Johnson, & Carlton, 2001; Ste-Marie, Gupta, & Derevensky, 2006). State anxiety is a transient type of anxiety which consists of physiological changes and feelings of worry. This type of anxiety occurs as a result of something in the environment that a person perceives as stressful (Spielberger, 1966). Trait anxiety is a personality characteristic marked by an inclination to react in an anxious manner to environmental stressors (Spielberger, 1966). Some researchers have discussed state and trait anxiety as being related to each other (Lau et al., 2006). In their study focusing on 529 twins ages 8-16, Lau et al. (2006) discussed the notion that when individuals have trait anxiety and are faced with an environmental stressor, they will express their fear and worry through state anxiety. Endler and Kocovski (2001) indicated different types of situations that may occur that could cause an increase in anxious feelings in an individual with trait anxiety. The authors discussed four types of situations including, social evaluation, physical danger, ambiguous, and daily routines. Social evaluation refers to situations where a person feels they are being scrutinized by others, whereas some individuals may experience anxiety if they feel they are physically in harm's way. Finally, some people become anxious over situations that are new to them which refers to ambiguous anxiety, and others have anxiety over everyday, daily routines. Whereas anxiety, including state and trait anxiety, is common in adolescents, it is not as widely researched as depression.

The Relationship between Anxiety and Depression. Essau et al. (2000) indicated that in many cases when individuals presented with depression, they actually had anxiety that preceded the depression. Anxiety also has been found to be comorbid

with depression (Essau et al., 2000; Goodwin & Gotlib, 2004; Velting & Albano, 2001; van den Bergh, Van Calster, Puissant, Van Huffel, 2008). State and trait anxiety also have been found to place adolescents at risk for different behaviors associated with depression, including suicidality (Ohring, Apter, Ratzoni, Weizman, Tyano, & Plutchik, 1996). In addition, studies by Beidel, Turner, Young, Ammerman, Sallee, and Crosby (2007), and Rao, Beidel, Turner, Ammerman, Crosby, and Sallee (2007) found that some individuals with social phobia experienced symptoms of depression such as loneliness and isolation as a result of their anxiety. These factors emphasize the importance of studying and identifying anxiety in adolescents.

Influence of Environment and Genetics on Anxiety. Anxiety disorders in adolescents have been found to be influenced by the environment, including family and peer relationships, and genetics (Lau et al., 2006; Legrand, McGue, & Iacono, 1999; Suveg, Aschenbrand, & Kendall, 2005). State anxiety has been found to be primarily impacted by the environment, whereas trait anxiety has been found to be influenced by the environment, including parent-child relationships, and genetics (Lau et al., 2006; Perdue & Spielberger, 1966). Lau et al. (2006) found trait anxiety to be somewhat influenced by environmental components, including the type of parenting style a child is exposed to (Perdue & Spielberger, 1966). In their study, Perdue and Spielberger (1966) found that children raised with parents who remained angry with them over an incident for a long period of time had higher levels of trait anxiety than children not raised with this type of parenting style. Whereas trait anxiety has been found to be partially influenced by environmental factors, researchers also have noted that genetics also plays a role (Legrand, McGue, & Iacono, 1999). Because trait anxiety has been described as more of a personality characteristic, it is not surprising

that genetics have been found to be a possible contributing factor since a person's genetic makeup does play a role in the development of their personality (Penke, Denissen, & Miller, 2007).

In addition to the studies previously mentioned, researchers also have found a genetic influence with many different types of anxiety in adolescents (Cronk, Slutske, Madden, & Heath, 2004; Ollendick & Hirsfeld-Becker, 2002). Research conducted on social phobia (Biederman, Petty, Faraone, Henin, Hirshfeld-Becker, Pollack, de Figueiredo, Feeley, & Rosenbaum, 2006) found genetic influences with this type of anxiety, whereas a study with 1887 pairs of twin girls conducted by Cronk et al., (2004) found genetic influences with separation anxiety disorder. Research also has found a genetic component for school phobia, including the presence of simple and/or social phobia in mothers and fathers of children with this type of anxiety (Martin, Cabrol, Bouvard, Lepine, & Mouren-Simeoni, 1999). Finally, panic disorder (Nocon, Wittchen, Beesdo, Bruckl, Hofler, Pfister, Zimmermann, & Lieb, 2008), and generalized anxiety disorder (Topolski, Hewitt, Eaves, Silberg, Meyer, Rutter, Pickles, & Simonoff, 1997) also have been found in the studies to have a genetic component in adolescents. This section has investigated the presence of internalizing behaviors in adolescents, however, externalizing behaviors also have been found to be prevalent with this population.

Externalizing Disorders

Whereas internalizing behaviors are behaviors such as anxiety and depression that manifest themselves inwardly, externalizing behaviors are outward behaviors, such as conduct disorder, alcohol use (Corte & Becherer, 2007), aggression (Liu, 2004), and delinquency (Liu, 2004; Steinberg et al., 2006). One of the most

widely researched externalizing behaviors in adolescents is substance use, including the use of alcohol.

It is quite normal for adolescents to experiment with alcohol (Lerner & Galambos, 1998) with alcohol use among this population increasing as adolescents get older (Duncan, Tildesley, Duncan, & Hops, 1995; Johnston et al., 2009; O'Malley, Johnston, & Bachman, 1998; Young, Corley, Stallings, Rhee, Crowley, & Hewitt, 2002). Most adolescents do not have an alcohol use disorder or alcohol dependence, but many have experimented with alcohol (Perkonigg, Pfister, Hofler, Frohlich, Zimmerman, Lieb, & Wittchen, 2006; Young et al., 2002). Research has found that alcohol may be a gateway substance that leads to the use of other drugs (Duncan et al., 1995; O'Malley et al., 1998), and that alcohol is used more frequently than other substances such as marijuana (Johnston et al., 2009; Young et al., 2002).

Whereas anxiety and alcohol use have both been found to be present among adolescents, studies also have investigated the change in these constructs over time. It is important to understand the changing nature of both of these constructs during the developmental stage of adolescence.

Changes and Stability of Anxiety and Alcohol Use Over Time

Changes in Anxiety Over Time

Adolescents may be more prone to internalizing disorders, such as anxiety, than children, as they experience many cognitive changes. The stage of adolescence begins to allow for the development of egocentrism and an imaginary audience, wherein adolescents think that peers and others in society are constantly thinking about, assessing, and judging them (Vartanian, 2000; Vartanian & Powlishta, 2001).

As adolescents begin to develop this imaginary audience (Vartanian & Powlishta, 2001) and begin to have the cognitive ability to be more aware of the opinions of others (Velting & Albano, 2001), they may start to experience anxiety as a result of their thoughts. As indicated previously, adolescents also start to develop an increased capacity for abstract thought processes (Steinberg & Morris, 2001). This contributes to the fact that anxiety, including panic disorder, and social phobia will become more prevalent during adolescence (Beidel et al., 2007; Masi, Favilla, Mucci, & Millepiedi, 2000).

Stability of Anxiety Over Time. In addition to the incidents of anxiety increasing as individuals move into adolescence, some studies also have shown that anxiety in one time point predicts future anxiety for individuals in this developmental stage (Gullone et al., 2001; Orvaschel et al., 1995). Ferdinand et al. (2007) conducted a two year longitudinal study with 2067 adolescents who were ages 10-12 at intake. The authors collected data with them once at intake, and once two years later, and explored the stability of different types of anxiety. Findings revealed that anxiety in younger adolescents at intake predicated anxiety two years later. Gullone et al. (2001) also found similar results regarding continuity of anxiety over time with a sample that consisted of two age groups at intake, one 10-14 years old and one 15-18 years old. Their study differed from Ferdinand et al. (2007), in that data was collected over a 3 year period of time, and yielded information about adolescents who were slightly older.

Changes in Alcohol Use Over Time

It has been found in various studies (Bradizza, Reifman, & Barnes, 1999; Duncan et al., 1995) that alcohol use increases as adolescents get older. In a study with a diverse sample of 699 White and African American adolescents ages 13-16, Bradizza et al. (1999) supported the notion that it is more normative for older adolescents to use alcohol than those in mid adolescence. In their longitudinal study where their sample was assessed on a yearly basis from mid to late adolescence, the authors also found that older and younger adolescents use alcohol for different reasons. Older individuals were found to use alcohol as a way to socialize with their peers, whereas those in mid adolescence used it more as a coping mechanism. Because peers can be influential, the possibility of using alcohol also increases as adolescents get older (Duncan et al., 1995) as older adolescents are more influenced by their peers than young children (Gardner & Steinberg, 2005).

Johnston et al. (2009) reported prevalence rates for alcohol use for adolescents in 10th and 12th grades supporting the notion that alcohol use in adolescents increases as they get older. Lifetime prevalence rates, as well as prevalence of alcohol use over the past 12 months, past 30 days, and daily use were reported. With regard to lifetime alcohol use, any alcohol use was reported by 58% and 72% of adolescents in 10th and 12th grades respectively, whereas 37% and 55% of adolescents in these grades reported that they had been drunk in their lifetime. For alcohol use over the past 12 months, any alcohol use was reported by 53% and 66% of adolescents in 10th and 12th grades respectively, whereas 30% and 46% of adolescents in these grades reported that they had been drunk in the last 12 months. When examining alcohol use over the past 30 days, any alcohol use was reported by 29% and 43% of adolescents in 10th and 12th grades respectively, and 14% and 28% of

adolescents reported that they had been drunk in the last 30 days. Finally, with regard to daily alcohol use, any alcohol use was reported by 1% and 3% of adolescents in 10th and 12th grades, and .3% and 1% of adolescents in these grades reported that they had been drunk on a daily basis. Sixteen percent of 10th graders and 25% of 12th graders also reported that they had consumed 5+ drinks in a row over the last 2 weeks.

Stability of Alcohol Use Over Time. In addition to alcohol use increasing over time, alcohol use in one time point has been found to predict future alcohol use (Blozis et al., 2007; Orvaschel et al., 1995; Steinhausen et al., 2007). A study by Toumbourou et al. (2003) with 3300 adolescents studied adolescents starting in 12th grade and continuing into young adulthood. The authors surveyed adolescents for the first time half way through their senior year in high school, then three months later, and finally two more times six months apart. The author's findings indicated that alcohol use in 12th grade predicted future alcohol use in individuals. Blozis et al. (2007) found similar results, but their study is especially useful as the authors solely studied individuals in adolescence. Blozis et al. (2007) conducted a longitudinal sample with 451 adolescents who were 13 years old at the first time point. Data were collected from the sample every year until they were 16 years old, and then once again when they were 18 years old. The findings indicated that alcohol use in one time predicted later alcohol use.

The Ecological Risk/Protective Theory emphasizes the notion that relationships and behaviors are dynamic and change over time (Bogenschneider, 1979; Lerner, 1991, 1995). The Interactional Theory of Delinquency supports this assertion and expands it to discuss the fact that change in deviant behaviors such as alcohol use is impacted by where an individual is in their life course (Thornberry et al., 1994).

Taken together, these two theories indicate that considering the impact of time with regard to different behaviors is important. Furthermore, examining behaviors in a particular point in a person's life course, in this case, adolescence, is also an integral aspect to consider when exploring how behaviors change over time.

Relationship Between Anxiety and Alcohol Use

Whereas research has clearly indicated that adolescents are impacted by both anxiety (DSM-IV-TR, 2000; Stein & Stein, 2008; Weems, 2008) and alcohol use (Johnston et al., 2009; Perkonnig et al., 2006; Young et al., 2002), studies also have found an association between anxiety and alcohol use in this population (Comeau, Stewart, & Loba, 2001; Deacon & Valentiner, 2000; Low et al., 2008; Nelson, Grant, Bucholz, Glowinski, Madden, Reich, & Heath, 2000; Zimmerman et al., 2003).

A study conducted by Costello et al. (2003) examined this association between anxiety and alcohol use over time in 1420 adolescents. The subjects in Costello et al.'s study were between 9 and 13 years old at intake, and this group of adolescents was studied annually until they were 16 years old. The outcome revealed that if anxiety was identified in the subjects, it was found to progress to alcohol use as the years progressed. Numerous studies have found that adolescents with anxiety utilize alcohol as a way to cope with their anxious feelings (Comeau et al., 2001; Deacon & Valentiner, 2000). This has been found in numerous studies with regard to adolescents with trait anxiety (Campeau et al., 2001; Stewart & Setline, 1995). Whereas both state and trait anxiety have been found to be related to higher levels of alcohol use, the reasons for alcohol use have been found to be more related to coping with trait anxiety (Campeau et al., 2001; Ste-Marie, Gupta, Derevensky, 2006). A study by Campeau et al. (2001) with 508 adolescents with a mean age of 15 found that

not only do more adolescents with trait anxiety use alcohol to cope, but they also experience more of a reduction in their anxiety symptoms with alcohol use than other adolescents. In addition to a relationship being found between anxiety and alcohol use, research also has indicated a temporal relationship between these two behaviors in adolescents (Kaplow, Curran, Angold, & Costello, 2001; Merikangas, Mehta, Molnar, Walters, Swendsen, Aguilar-Gaziola, Bijl, Borges, Caraveo-Anduaga, Dewit, Kolody, Vega, Wittchen, & Kessler, 1998; Zimmermann et al., 2003).

Temporal Relationship Between Anxiety and Alcohol Use

The majority of studies related to the temporal relationship between anxiety and alcohol use have found that anxiety precedes alcohol use in adolescents (Goodwin, Fergusson, & Horwood, 2004; Merikangas et al., 1998). Merikangas et al. (1998) examined data from six different studies that used sample of adolescents and adults, and found that anxiety disorders preceded alcohol problems in the majority of people. In a 21 year longitudinal study, examining 1265 children from birth to 21 years of age, Goodwin et al. (2004) also found that anxiety preceded alcohol use in their sample. Rohde et al. (1996) and Sung et al. (2004) found similar results in their longitudinal studies, but found gender specific result, in that girls who were anxious were found to be at higher risk for alcohol use in later years.

Anxiety and alcohol use among adolescents are impacted by both family and peer relationships, which may have a positive or negative impact on these constructs in this population. As the Ecological Risk/Protective Theory emphasizes the fact that protective influences can occur in different systems, including family and peer contexts, this theory will also be useful in examining the influence of family and peers on anxiety and alcohol use. Lerner's component of this theory and The

Interactional Theory of Delinquency also emphasize the reciprocity inherent in these relationships. Consequently, adolescents are impacted in a reciprocal fashion by relationships in both family and peer contexts. Furthermore, because anxiety is clearly associated with alcohol use in adolescents, the Stress-Buffering Hypothesis will be useful in exploring the ways in which these family and peer relationships can act to buffer this association. There are a plethora of factors that have been found within both the family environment and peer interactions which are associated with anxiety and alcohol use among adolescents. Although this dissertation will be concentrating on protective factors of family and peers, it is necessary to examine both the risk and protective factors of these two groups and their relationship to anxiety and alcohol use in adolescents.

Given the fact that the sample for this dissertation consists of middle to older adolescents, it was expected that peer variables would act to buffer adolescents more with regard to alcohol use. This is consistent with various studies that have been previously discussed that indicated that individuals begin to seek more autonomy from family and relate more to peers as they progress through adolescence (Hill et al., 2007; Levpuscek, 2006). This expectation is also similar to a study conducted by Cleveland, Feinberg, Bontempo, and Greenburg (2008). The study that was conducted with 91,778 students in 6th, 8th, 10th, and 12th grades found that family risk and protective factors were more influential to younger students, whereas peer risk and protective factors were more influential to adolescents in the older grades.

These findings are supported by the aspect of The Interactional Theory of Delinquency that discusses the fact that individuals are impacted differently by individuals such as peers or parents, depending on where they are in their life course.

Therefore, utilizing this theory, these studies indicated that peers are more influential in adolescents because of where they are in their life course. Although studies have indicated that peers may be more influential to students in the sample utilized in this dissertation, it is still important to investigate the influence of both family and peer factors on this population.

The Influence of the Family Environment on Adolescents

In addition to the previously discussed studies about the impact that family autonomy can have on anxiety and alcohol use in adolescents, studies also have reviewed how other aspects of the family environment have impacted these constructs. The studies on the impact of the family environment on adolescents have examined both risk and protective influences with regard to the influence that the family has on anxiety and alcohol use.

The Family Environment and Anxiety: Risk Factors

With regard to the family environment, studies have found various family characteristics that present themselves as risk factors with regard to anxiety in adolescents. Vulic-Prtoric and Macuka (2006) found a significant relationship between a lack of parental warmth and higher levels of anxiety. The authors found that children and adolescents who were anxious felt more rejected by both their mother and their father, and they also felt less satisfied with their family environment. Related to this, Ballash, Pemble, Usui, Buckley, and Woodruff-Borden (2006) also found that problems in the family environment led to more anxiety among adolescents. These authors found a relationship between poor family communication and higher levels of anxiety in the participants in their study. Parental control (Muris, 2006; van Brakel, et

al., 2006; Wolfradt et al., 2003), pressure (Wolfradt et al., 2003), and rejection of adolescents by their parents (Muris, 2006) were other aspects of the family environment that were also found to be associated with anxiety.

The Family Environment and Anxiety: Protective Factors

As discussed previously, an abundance of research has examined risk factors in the family environment related to anxiety. Less research has examined the protective influences of families on internalizing behaviors such as anxiety, with more studies examining protective influences on externalizing behaviors such as alcohol use (Cleveland et al., 2008). Of the research that has examined protective influences related to internalizing behaviors, some research has examined the influence of families in the overall well-being of adolescents (Helsen, Vollebergh, & Meeus, 2000), whereas other research has examined internalizing disorders such as depression (Jenkins, Goodness, & Buhrmester, 2002). Even fewer studies have examined familial protective influences on anxiety, but those that did examined this influence on overall anxiety instead of specific types (Zimmerman, Ramirez-Valles, Zapert, & Maton, 2000). The main findings on familial factors and internalizing disorders found that support, warmth, and a secure attachment acted as a buffer against problems such as anxiety and depression.

Family support. One of the characteristics that has been widely identified as a protective mechanism regarding families and anxiety is support. Family support has been found to act as a protective factor in its relation to overall well-being in adolescents (Helsen et al., 2000), as well as internalizing behavior in this population (Chester et al., 2007). In a study with a diverse, urban community sample of 160

adolescents, Way and Chen (2000) found through self-report questionnaires, that adolescents who felt their parents were more supportive had higher levels of psychological well-being. The authors measured psychological well-being as a composite score that combined measures of self-esteem and depression. Related to this, Beam, Gil-Rivas, Greenberger, and Chen (2002), Helsen et al. (2000), and Jenkins et al. (2002) all found that support was inversely related to depression. Others, including two studies with adolescents in Hawaii (Goebert, Nahulu, Hishinuma, Bell, Yuen, Carlton, Andrade, Miyamoto, & Johnson, 2000; Guerrero, et al., 2006), and a study with urban African-American boys (Zimmerman et al., 2000), have found a relationship between parental support and anxiety. Some research has even indicated that parental support and the adolescent-parent bond may be more influential to the well-being of an adolescent than the relationships they have with their peers (Van Wel, Ter Bogt & Raaijmakers, 2002).

Warmth and attachment. Warmth and a secure attachment with parents also have been found to have a protective influence on anxiety and well-being in adolescents. Overall, it has been found that warmth in families better equips adolescents with the resources that they need to navigate the stage of adolescence (Steinberg et al., 2006), and also acts to protect them against depression (Beam et al., 2002; Chester et al., 2007) and anxiety (Wolfradt et al., 2003). Secure attachments with parents are also important in that insecure adolescents have been found to experience more anxiety (Muris, 2006; van Brakel et al., 2006), and may bring their insecurities into their peer interactions, potentially negatively impacting their friendships (Levpuscek, 2006). Contrary to this, attachment with parents may act to protect individuals from internalizing behaviors (Dekovic, 1999). Related to

attachment, intimacy with parents also has been shown through community samples of adolescents to have an inverse relationship to internalizing behaviors in this population (Field, Diego, & Sanders, 2002; Field, Lang, Yando, & Bendell, 1995).

The Family Environment and Alcohol Use: Risk Factors

Similar to the studies on the family environment and anxiety in adolescents, it has been found that there are also risk factors in the family environment related to alcohol use in adolescents. Research has found both direct and indirect risk factors such as low family support (Windle & Mason, 2004), low cohesion, high levels of family conflict, and low levels of parental monitoring (Li et al., 2000; Wu et al., 2004).

Family cohesion. Werner and Silbereisen (2003) found an indirect relationship between family cohesion and substance use. In their study with 248 German adolescents, the authors found that low levels of family cohesion were associated with an increase in interaction with deviant peers, defined in the studies as individuals involved with behaviors such as fighting, stealing, and truancy (Duncan, Duncan, Biglan, & Ary, 1998; Fergusson, Swain-Campbell, & Horwood, 2002). Associating with antisocial or deviant peers has been found to be a strong predictor of alcohol use in adolescents (Nation & Heflinger, 2006). Thus, the indirect relationship between family cohesion and substance use found by Werner and Silbereisen (2003) may impact the use of substances, such as alcohol among adolescents due to their association with antisocial or deviant peers.

Family conflict. In addition to low levels of family cohesion, high levels of conflict within a family environment also have been found to put adolescents at risk

for alcohol use. A study by Wu et al. (2004) with 419 adolescents seeking treatment for chemical dependency, found that those who reported higher conflict in their families had more severe use of substances such as alcohol. Similar results among community samples of adolescents also have found that high conflict placed adolescents more at risk of using alcohol or alcohol (Bray et al., 2001; Getz & Bray, 2005).

Parental monitoring. Finally, lower levels of monitoring by parents (Li et al., 2000) have been found to have a direct impact on alcohol use in adolescents. Whereas parental monitoring has been found to be a risk factor, this characteristic of families, as well as many others, such as parental disapproval of alcohol (Bogenschneider, Wu, Raffaelli, & Tsay, 1998; Zhang, Welte, & Wieczorek, 1997) also have been found to act as protective influences against alcohol use in adolescents.

The Family Environment and Alcohol Use: Protective Factors

Although the vast majority of studies have examined parental monitoring (Barnes, Reifman, Farrell, & Dintcheff, 2000), support, cohesion, and closeness are also factors that have been extensively found to act as protective mechanisms with regard to alcohol use in adolescents (Kuendig & Kuntsche, 2006).

Parental monitoring. Parental monitoring has been found to act as a protective mechanism against alcohol use in adolescents in many studies (Bahr, Maughan, Marcos, & Li, 1998; Beck, Shattuck, Haynie, Crump, & Simons-Morton, 1999; Dishion, Nelson, & Kavanagh, 2003; Getz & Bray, 2005; Piko & Kovacs, 2010; Schinke et al., 2008). Parental monitoring has been found to impact alcohol use in adolescents in both prospective (Di Clemente, Wingood, Crosby, Sionean, Cobb,

Harrington, Davies, Hook, & Oh, 2001; Kokkevi, Richardson, Florescu, Kuzman, & Stergar, 2007; Schinke et al., 2008) and longitudinal (Webb et al., 2002) studies, with Hawkins, Graham, Maguin, Abbott, Hill, and Catalano (1997) finding that parental monitoring at ages 10-11 resulted in a lower likelihood of alcohol use at ages 17-18. Parental monitoring also has been found to deter adolescents from moving into heavier drinking patterns (Reifman, Barnes, Dintcheff, Farrell, & Uhteg, 1998), with Nash, McQueen, and Bray (2005) reporting that of the 2573 adolescents in their study those with parental monitoring had a decreased quantity and frequency of alcohol use. Related to this, Wu et al. (2004) found that among those seeking treatment sample for chemical dependency, adolescents with higher levels of parental monitoring presented with less severe drug and alcohol problems. Finally, parental monitoring has been found to impact the initiation of alcohol use, with higher levels of monitoring leading to less alcohol initiation among a sample of 808 adolescents (Kosterman, Hawkins, Guo, Catalano, & Abbott, 2000).

Family support. Family support also has frequently been found in the studies to act as a protective mechanism with regard to adolescents and alcohol use. A community sample of 881 adolescents (Piko & Kovacs, 2010), as well as numerous other studies (Anderson & Henry, 1994; Kuendig & Kuntsche, 2006; Piko, 2000; Wills, Resko, Ainette, & Mendozza, 2004) have all found an inverse relationship between family or parental support and alcohol use. The impact of support on the use of substances such as alcohol has been found to act as a protective factor in studies with younger (Marshal & Chassin, 2000; Wills & Cleary, 1996; Wills, Gibbons, Gerrard, Murry, & Brody, 2003), and older adolescents (Guerrero et al., 2006; Henry, Robinson, & Wilson, 2003). In addition, it has been found through longitudinal

research (Windle & Mason, 2004) that family support in young adolescents was associated with less alcohol use when they entered late adolescence.

Family cohesion and closeness. Longitudinal research on the protective influence of family cohesion also has found this characteristic to be a buffer against alcohol use among different stages of adolescence. Whereas a study by Cleveland et al. (2008) with 1,778 students found cohesion to be more protective among younger adolescents, Duncan, Duncan, and Hops (1994) found it to be more of a buffer with older adolescents. Other studies also have found both family cohesion (Duncan et al., 1995; Husler et al., 2005) and family closeness (Gaughan, 2006; Husler et al., 2005; Kuendig & Kuntsche, 2006; Kuntsche & Silbereisen, 2004) to be protective mechanisms against alcohol use, with some research indicating that family closeness is particularly protective with girls (Kumpfer, Smith, & Summerhays, 2008).

Protective Family Factors: Anxiety and Alcohol Use

Two bodies of research previously discussed on the impact of the family environment have outlined protective family factors related to anxiety and alcohol use clearly supporting The Ecological Risk/Protective Theory in the notion that the family system can have a protective influence on adolescent behaviors. Aside from one study that found family characteristics had a buffering effect on the association between social phobia and alcohol use in an adult population (Buckner & Turner, 2009), the studies on this topic have not examined this effect with an adolescent population. In addition, the research primarily examines family support, warmth and attachment, parental monitoring, family cohesion, and closeness and has not looked as extensively at other family characteristics such as parental communication with mother and father,

family satisfaction, and parental limit setting. Thus, a gap in the research exists with regard to whether parental communication with mother and father, family satisfaction, and parental limit setting act as protective factors buffering the relationship between different types of anxiety and alcohol use. Because research has found family to act as a buffer in the association between anxiety and alcohol use in adults, it can be hypothesized that family characteristics may also buffer the relationship between anxiety and alcohol use in an adolescent population.

As an association between anxiety and alcohol use has been previously established, it appears to be a logical step in the research on anxiety and alcohol use to explore the buffering impact of parental communication with mother and father, family satisfaction, and parental limit setting on this relationship. As the Stress-Buffering Hypothesis discusses the notion that one's environment can impact detrimental behavior, it is a fitting way to explore the potential buffering impact of the aforementioned family characteristics. Furthermore, because Lerner's component of the Ecological Risk/Protective Theory, and The Interactional Theory of Delinquency both emphasize the importance of reciprocity in relationships, these theories are also useful in exploring the buffering impact of different family characteristics. These aspects of the theories highlight the reciprocity that is inherent in family/adolescent relationships. All of the family moderating variables require a reciprocal relationship between an adolescent and their family members, and this relationship enables families to provide protective mechanisms that may help buffer different behaviors in adolescents.

Parental communication. With regard to communication, this family variable has been found to decrease health-risk behaviors such as sexual behavior,

tobacco use, and alcohol use in adolescents (Riesch, Anderson, & Krueger, 2006). A variety of studies have specifically found communication to be a protective mechanism against substances, such as alcohol in adolescents (Kuendig & Kuntsche, 2006; Nash et al., 2005; Oman et al., 2004; Wills et al., 2003).

Additional studies have found family communication to act as a buffer against delinquent behavior overall (Clark & Shields, 1997; Davalos, Chavez, & Guardiola, 2005). Through self-administered questionnaires with a community sample of 339 adolescents, Clark and Shields (1997) found that adolescents who communicated well with their parents had less delinquent behavior, which was described as skipping school, theft, and alcohol use. Davalos et al. (2005) found similar results through an ethnically diverse sample of 576 adolescents, with their definition of delinquent behavior including things such as vandalism and theft. Related to this, Fitzpatrick (1997) also found good parental communication to be related to a decrease in fighting behavior among adolescents. Because the studies have indicated that communication with parents has been found to act as a buffer against alcohol use and other delinquent behavior in adolescents, it would be an appropriate characteristic to use to examine its potential protective influences on the relationship between different types of anxiety and alcohol use. In addition, this dissertation can expand current studies on the topic by looking at the protective influences of parental communication with mother and father separately as many studies combine this variable into overall communication with parents (Clark & Shields, 1997; Fitzpatrick, 1997).

Family satisfaction. Family satisfaction has been examined in different studies as a protective mechanism with regard to internalizing behaviors as well as

externalizing behaviors such as alcohol use and problem behaviors, such as fighting with peers. Silmere and Stiffman (2006) found an inverse relationship between alcohol use and family satisfaction in a community study with 401 American Indian adolescents. The authors found family satisfaction to be inversely related to alcohol use through a measure they termed success, meaning an adolescent who did not use alcohol, and had good mental health including positive behavior and emotions. Woolley and Grogan-Kaylor (2006) also found that family satisfaction acted as a protective factor in a community study, but with a national sample of 2,099 students in middle and high school. Results of the author's study indicated that family satisfaction acted as a buffer leading to less problem behaviors, described by the authors as getting in trouble in school, suspension, and fighting with peers. Through these studies, family satisfaction has proven to be a buffer against some internalizing and externalizing behaviors in adolescents. Despite this, it is not studied as readily as other family characteristics such as monitoring and support. Thus, taking together the fact that a paucity of research has examined family satisfaction as well as the association between anxiety and alcohol use, using this variable to study this association would fill numerous gaps in the research.

Parental Limit Setting. Parental limit setting is also a variable that has not been as widely researched, but one which has been shown to be something favored by parents, and has been shown to act as a buffer against various negative adolescent behaviors. A study with 87 parents of African American adolescents found that parents were in favor of setting limits as they felt it was important to socialization and the psychological development of their children (Smetana & Chuang, 2001). A study by Wu et al. (2004) found that parental limit setting was associated with psychological

development in adolescents. Through their study, Wu et al. (2004) examined a treatment sample of 419 adolescents between the ages of twelve and eighteen that were receiving services related to substance use and found that limit setting was inversely related to depression in their sample. The authors also found an inverse relationship between parental limit setting and severity of alcohol use. A study by Boislard, Poulin, Kiesner, and Dishion (2009) also found an inverse relationship between parental limit setting and adolescent behavior, this time with regard to risky sexual practices. In their longitudinal study with 267 adolescents who were assessed yearly from grades eight to ten, the authors found that more parental limits were associated with less risky sexual behaviors such as fewer sexual partners, and more condom use. Similar to the studies on communication and family satisfaction, there also appears to be a paucity of studies related to the impact of parental limit setting on adolescent behavior. Because there have been some studies indicating a relationship between this family variable and some behaviors in adolescents, it seems appropriate to further the studies by exploring its potential buffering impact on the association between anxiety and alcohol use.

Whereas studies have discussed the influence of the family environment on anxiety and alcohol use, they also suggest that peers influence these two things. This relationship is understandable given the fact that both internalizing and externalizing behaviors in adolescents, especially social phobia and alcohol use, are likely to involve an adolescent's peers.

The Influence of Peers on Adolescents

Similar to familial influences, the studies discuss both risk and protective factors of peers with regard to anxiety and alcohol use. Even though this dissertation

is concentrating on protective factors, it is important to have a comprehensive understanding of the impact that peers have on this population by examining both the negative and positive ways that peers contribute to anxiety.

The Influence of Peers on Anxiety: Risk Factors

In addition to the previously discussed ways in which cognitive and biological changes in adolescence impact peer relationships, studies also discuss other aspects of peer relationships in this developmental stage that impact anxiety. Studies have discussed many ways in which peer relationships impact adolescents, including the presence of peer crowd affiliation and cliques. Peer crowd affiliation is the larger group that an adolescent is affiliated with due to characteristics they possess. For example, an adolescent may be a part of the Jocks crowd because they play a number of sports. Cliques are the group of friends that an adolescent spends time with on a regular basis. Adolescents may interact more with members of their clique than with members of the crowd they are affiliated with (Brown, 1990). The impact of peer crowd affiliation will be discussed in this section related to anxiety, and cliques will be discussed in a later section on the impact of peers on adolescent alcohol use.

Peer crowd affiliation. Peer crowd affiliation refers to subgroups among larger peer groups that adolescents belong to (Brown, Von Bank, & Steinberg, 2008). Different peer crowd affiliations include the Populars, Jocks, Brains, Burnouts, Non-Conformists, Average/Normal, Druggies, and Toughs/Outcasts (Brown et al., 2008; Prinstein & La Greca, 2002). Peer crowd affiliation is further delineated in the studies on peer relationships into those belonging to high moderate, and low status groups. Typically, those in high status groups may be adolescents belonging to the

Populars/Jocks, whereas moderate status may be Brains/Normal, and those in low status would be Burnouts/Outcasts (Brown et al., 2008; La Greca & Harrison, 2005). The peer crowd and status level that an adolescent finds themself in can have an impact on self-esteem as well as internalizing behaviors such as anxiety and depression (Brown et al., 2008).

A study looking at peer crowd affiliation was conducted by Prinstein and La Greca (2002) with 246 adolescents at two time points, when individuals were in fourth to sixth grade and when they were in tenth to twelfth grade. The authors found that those who were in the Populars/Jocks crowd experienced less internalizing behaviors, such as depression and anxiety over time. Contrary to this, those who identified themselves as Brains experienced more internalizing behaviors as time went on. Brown et al. (2008) found similar results in their study which examined adolescents in high, moderate, and low status social groups. Their findings indicated that those in high status groups (Populars/Jocks) had higher self-esteem and lower depression than those in lower status groups (Druggies/Toughs & Outcasts). La Greca and Harrison (2005) also found similar results in their study on social phobia, but found that this type of anxiety was actually lower in both high status (Populars/Jocks) and low status (Burnouts/Alternatives) groups. Thus, those at the high and low ends of the spectrum of social status seemed to be protected from social phobia. Eder (1985) also examined anxiety, but found opposite results from Brown et al. (2008) and La Greca and Harrison (2005) in that those in high status groups actually experienced the highest levels of anxiety. Taken together, although research seems to have found slightly mixed results with regard to the impact of crowds and social status on

adolescents, it is nonetheless clear that these components of peer relationships do have a role in the development of internalizing disorders.

The Influence of Peers on Anxiety: Protective Factors

Whereas some research has discussed risk factors related to peers and the development of internalizing behaviors such as anxiety in adolescents, other research has examined the protective factors of peer relationships on internalizing behaviors such as anxiety and depression. Overall, adolescents who reported that they had good quality friendships were found to have better emotional adjustment (Demir and Urberg, 2004). As part of the Adolescent Peer Influence Project which looks at how peers influence alcohol use, Demir and Urberg defined good quality friendships as those that were secure, close, and low in conflict. They measured emotional adjustment with a survey that examined happiness and depression and a positive relationship between good friendships and emotional adjustment.

Similarly, Burk and Laursen (2005) in a community sample of 171 young Floridian adolescents found an inverse relationship between friendship and internalizing behaviors such as anxiety and somatic complaints. Inverse relationships were also noted between anxiety and friendship in studies by La Greca and Harrison (2005) who looked specifically at social phobia, and Procidano and Heller (1983) who examined trait anxiety. Other internalizing disorders such as depression also have been found to be buffered by positive peer relationships, with characteristics such as trust, and positive reinforcement (Chester et al., 2007; Hussong & Hicks, 2003), peer support (Way & Chen, 2000; Windle, 1992), and intimate friendships such as those where peers felt comfortable disclosing information to one another (Buhrmester, 1990; Field et al., 2002).

The Influence of Peers on Alcohol Use: Risk Factors

Similar to the research on the influence of peers on anxiety, research on the influence of peers on alcohol use also discusses both risk and protective factors. This section will expand upon the previous discussion about the ways in which cognitive and biological changes impact peers and alcohol use. Research on the influence of peers on alcohol use in adolescents overwhelmingly supports the notion that peers exert a significant influence. Some of the studies on this topic support the fact that peers are more influential than parents with regard to overall alcohol use (Zhang et al., 1997), whereas other research indicates that peers are more influential only after alcohol use has been initiated (Kandel, 1985). The majority of studies acknowledge the fact that adolescents who perceive that their friends drink (Cardenal & Adell, 2000), or who have peers that actually do use alcohol have a higher likelihood of using alcohol themselves (Bahr et al., 1998; Epstein, Botvin, Baker, & Diaz, 1999). In addition, some research has indicated that association with deviant peers is the greatest predictor that adolescents will have higher levels of alcohol use (Blanton, Gibbons, Gerrard, Conger, & Smith, 1997; Duncan et al., 1995; Epstein et al., 1999; Windle, 2000).

Peer encouragement to use alcohol. Overall, peers have been found to be reinforcing of alcohol use (Prinstein, Boergers, & Spirito, 2001), and when there is peer encouragement to use alcohol, adolescents have a higher likelihood of greater alcohol use or use of other drugs (Duncan et al., 1994; Ellickson, Collins, & Bell, 1999). More specifically, Ellickson et al. (1999) used a diverse sample of adolescents and found that those who associated with peers who used alcohol and marijuana, were more likely to become involved with hard substances, defined as illegal substances

other than marijuana. In addition, those with peers who used substances were found to have a greater amount of polydrug use, including the use of different substances such as alcohol, marijuana, cocaine, and stimulants (Windle & Mason, 2004).

Associating with peers who use alcohol was found to be related to movement into heavier drinking among adolescents (Reifman et al., 1998). More specifically, the severity (Wu et al., 2004) and frequency of heavy drinking was related to the number of alcohol using peers an adolescent had (Prinstein et al., 2001). With regard to peer influence, it has been suggested that peer relationships that are of a higher quality (Urberg, Luo, Pilgrim, & Degrimencioglu, 2003) where adolescents feel more social support from their friendships (Piko, 2000) contribute to a greater amount of alcohol use on the part of the adolescent. This may be because adolescents who enjoy their friendships want to share in activities that they find enjoyable, such as alcohol use (Urberg et al., 2003).

Friendship quality/status and alcohol use. The type of friendship adolescents have may also contribute to their alcohol consumption. Research shows that if adolescents have a friend who is more popular than they are, the less popular friend will be more influenced by the drinking behavior of the more popular friend (Bot, Engels, Knibbe, & Meeus, 2005). Bot et al. (2005) indicated that less popular adolescents will drink in order to maintain the friendship of the more popular adolescent. Contrary to friendships where one adolescent is more popular than the other, reciprocal friendships where both friends are on the same level and acknowledge that they are both friends with each other, do not appear to be as influential as when there is more of a social hierarchy in the friendship (Bot et al., 2005).

Cliques. Related to friendship quality and status, research has indicated that cliques may also have an influence on alcohol use in adolescents. In a study with 378 adolescents with a mean age of 17, Hussong (2002) found that if a person belonged to a clique where individuals used more alcohol than the person's best friend, that individual was more likely to use alcohol. Contrary to this, adolescents who belonged to a clique with individuals who used less alcohol than their best friend actually used less alcohol. Thus, the study by Hussong (2002) found that the clique an adolescent belonged to may be more influential than a best friend with regard to whether or not that adolescent uses alcohol. A community based study with sixth, eighth, and tenth graders found a similar influence with regard to cliques and cigarette use (Urberg, Degirmencioglu, Serdar, and Pilgrim, 1997). The authors found that an adolescent's best friend was more influential with regard to initiation of cigarette smoking, but that friendship groups or cliques that smoked influenced the adolescent to smoke on a more regular basis.

Taken together, the research on the influence of peers on alcohol use in adolescents indicates that peers are typically encouraging of each other's alcohol use. Peers also seem to be quite influential in the decisions that adolescents make to become involved with alcohol. Peer friendships not only impact initial involvement, but they also may influence the frequency and severity of alcohol use among this population.

The Influence of Peers on Alcohol Use: Protective Factors

Whereas an abundance of research has examined risk factors related to the influence of peers on alcohol use in adolescents, research also has examined the ways in which peers can act as a buffer with regard to alcohol use and other externalizing,

delinquent behaviors such as aggression, lying, and disobeying people at school. Overall, research has found that adolescents who have friends report more of an ability to resist peer pressure, as examined by a qualitative study with a predominately Caucasian sample (Chu, 2005). Bot et al. (2005) also found that the presence of reciprocal friendships, described as both adolescents acknowledging that they are friends, acted as a buffer wherein an adolescent can resist peer pressure by not engaging in drinking behavior.

Prosocial peers. Similar findings about drinking behavior and other alcohol use have been found with regard to associating with prosocial peers. Associating with deviant peers has been found to be more likely to lead to alcohol use than associating with peers who have prosocial behavior such as involvement in after school activities (Prinstein et al., 2001). In addition, peer role models, described as how responsible a peer is, have been found to lead to no alcohol use. Oman et al. (2004) found this to be true in a study they conducted with 1350 households with one adolescent and one parent matched in each house. The authors utilized questionnaires to determine if an adolescent had peer role models, by asking them if they felt that most of their friends were responsible. Oman et al. (2004) then examined alcohol and drug use of the adolescent over the past thirty days, and found an inverse relationship between peer role models and alcohol use.

Peer support/positive peer relationships. Peer support and positive peer relationships also have been found to act as a buffer against alcohol use and other externalizing behaviors (Chester et al., 2007; Scholte et al., 2001). Chester et al. (2007) conducted a study with African American adolescents and found that positive

peer relationships, described as those that included trust and positive reinforcement, resulted in less delinquent and aggressive behaviors, such as lying and disobedience at school. In addition to support and positive peer relationships, the mere act of socializing with peers also has been found to act as a buffer against substance use in adolescents (Ellickson et al., 1999).

Taken together, the research on the influence of peers on anxiety and alcohol use in adolescents outlines risk factors for this population, but also identifies numerous ways in which peers have been found to have a protective influence. Peer relationships have been found to protect adolescents against problem behaviors when examined separately, and also have been found to moderate the relationship between different behaviors. An example of this is indicated by Adams and Bukowski (2007) who found that good quality friendships buffered the association between sexual abuse and anxiety disorders. Despite this, there is a gap in the studies with regard to an exploration of the way in which peer relationships act as a buffer in the association between anxiety and alcohol use in adolescents. Given the fact that a moderating relationship has been found regarding peer friendships and other problem behaviors, one can hypothesize that this may also be the case for anxiety and alcohol use.

Protective Peer Factors: Anxiety and Alcohol Use

Regarding the friendship characteristics that may be useful to use to examine this association, support has been established as acting as a buffer with regard to depression, thus this would be an excellent friendship trait to use. Social competence also has been utilized to examine adolescent problem behaviors. Thus, looking at the friendship characteristics of social support and social competence as

potential buffers of the association between anxiety and alcohol use would extend the studies that have examined the impact of peer relationships on adolescents.

As these traits have been found to act as protective influences, studies are in support of the fact the Stress-Buffering Hypothesis wherein peers may act to buffer the relationships between anxiety and alcohol use. Furthermore, the protective influence of peers also supports the notion of The Ecological Risk/Protective Theory in that the peer system can have a protective influence on individuals. Because peer relationships are being examined as the ways in which they buffer the relationship between anxiety and alcohol use over time, Lerner's component of this theory is also useful in exploring the protective influence of peers over time. As stated previously, because peers have been shown to impact individuals during the stage of adolescence more than family members, The Interactional Theory of Delinquency is an excellent way to examine the influence of peer relationships during this particular stage of an individual's life course. Similar to the discussion on the protective influence of families, Lerner's component of the Ecological Risk/Protective Theory, and the Interactional Theory of Delinquency are also useful in considering the reciprocal nature of peer relationships. Whereas the reciprocity inherent in family relationships was previously discussed, peer relationships also require reciprocity between an adolescent and their peers. Therefore, any protective effects from peer relationships will be the result of this reciprocal process.

Social Support. Numerous studies previously reported in this review have found peer social support to act as a buffer with regard to internalizing problems including anxiety (Procidano & Heller, 1983; Way & Chen, 2000; Windle, 1992) and externalizing problems including alcohol use (Scholte et al., 2001). Many of the

studies have examined the concept of social support with regard to numerous peer relationships. However, it has been found that even one friend can act as a protective mechanism in adolescents. Bishop and Inderbitzen (1995) found in their study of 542 ninth graders, that adolescents who indicated that they had one friend had higher levels of self-esteem. Thus, it would be beneficial to examine whether social support from a close friend acts a buffer regarding the association between anxiety and alcohol use in adolescents.

Social Competence. Social competence is a variable that also has been found to act as a protective mechanism against both internalizing and externalizing behaviors in adolescents. Simons-Morton (2002) found an inverse relationship between social competence and smoking initiation in their study with 1081 middle school students, whereas Griffin, Nichols, Birnbaum, and Botvin (2006) found a similar relationship with alcohol use and aggression/delinquency. The authors examined specific components of social competence, including assertiveness and social confidence with a sample of 2411 sixth grade students in New York City. Their results indicated that assertiveness acted as a buffer against problem behaviors such as alcohol use and aggression/delinquency. Lillehoj, Trudeau, Spoth, and Wickrama (2004) also examined assertiveness as a component of social competence in their longitudinal study, and found that assertiveness had an inverse relationship to internalizing behaviors in adolescents. Internalizing behavior in their study was measured by a survey examining feelings of both depression and anxiety in adolescents. Griffin et al. (2006) stated that this variable has been utilized in numerous studies with child samples, but has not been used as frequently to study adolescents. Due to this, it would be useful to use this concept to examine the

association between anxiety and alcohol use in an adolescent population in order to further the adolescent studies.

Gender Differences

In general, boys and girls are socialized differently in our society, and there are sex-role stereotypes that shape their actions and behaviors (Hibbard & Buhrmester, 1998; Leahy, 1981; Neff & Terry-Schmitt, 2002). Overall, girls are encouraged to take on more feminine characteristics which consist of placing importance on maintaining relationships, and being cooperative, supportive, nurturing, and sensitive to the needs of others (Diekman & Goodfriend, 2006; Hibbard & Buhrmester, 1998; Neff & Terry-Schmitt, 2002). In addition, there is an emphasis placed on girls being more passive, weak, submissive, obedient, and dependent on their families (Bartle-Haring, 1997; Leahy, 1981; Neff & Terry-Schmitt, 2002). Girls are also perceived as more sensitive, emotional, nice, and sociable (MacLean, Sweeting, & Hunt, 2010; Prentice & Carranza, 2002).

Contrary to this, boys are taught not to show emotion and to be more stoic than girls (MacLean et al., 2010), and are stereotyped as being more irresponsible and less mature than girls (Nielsen, 2004). Boys are also taught to assume other masculine characteristics such as being more dominant, assertive, driven, strong, independent, and more autonomous from their families (Bartle-Haring, 1997; Hibbard & Buhrmester,1998; Neff & Terry-Schmitt, 2002; Prentice & Carranza, 2002). Boys have been found by Hoover and Fishbein (1999) to be more stereotyped with regard to sex roles than girls, and when they become adolescents, they may feel more pressure to maintain these stereotypes than girls.

Sex role stereotypes are perpetuated through the actions of parents, with fathers playing a greater role in emphasizing the importance of sex role stereotypes than mothers (O'Bryan, Fishbein, & Ritchey, 2004; Witt, 1997). As research has indicated that boys and girls are socialized differently in society, with parents playing a role in this socialization, it is not surprising that boys and girls may experience differences in the relationships they have with their mothers and fathers (Eggebeen, 2008; La Freniere & Stroufe, 1985).

Family, Anxiety, Alcohol Use, and Gender Differences

As a whole, research indicates that there are gender differences with regard to the relationships adolescents have with their family members. Both mothers and fathers have been found to be important in the lives of both boys and girls, with mothers being more involved overall than fathers (Hawkins, Amato, & King, 2006).

Research has indicated that the relationship that both boys and girls have with their mothers is important in the development of social competence (Kerns, Klepac, & Cole, 1996; La Freniere & Stroufe, 1985). In addition, as individuals move into the developmental stage of adolescence, both boys and girls use their mothers more for support, with girls seeking more support than boys (Paterson, Field, & Pryor, 1994). Related to this, adolescent girls have been shown to perceive their mothers to be more available than their fathers, and are more likely to be dependent on their mothers versus their fathers (Lieberman, Doyle, & Markiewicz, 1999). The influence of mothers also has been shown to have a negative impact on adolescent behaviors, especially if the mother is suffering from a psychological disorder such as depression (Ohannessian, Hesselbrock, Kramer, Kuperman, Bucholz, Schuckit, & Nurnberger, 2005). In their study, Ohannessian, et al. (2005) found that maternal depression

predicted anxiety in adolescents. Perhaps this is true due to depressed mothers not being available to their children due to their emotional problems. As research has indicated the importance of mothers in the lives of adolescents, fathers also have been found to be an integral part of the lives of individuals in this developmental stage.

The work of George Williams, a leading expert on fathering, has emphasized the importance of the involvement of fathers in the lives of adolescents in order to help individuals in this stage of development form a positive identity (2007). Williams (2007) has emphasized the importance of fathers modeling positive behaviors and creating moments in everyday life that provide the opportunity to teach adolescents how to become prepared to be more mature and responsible. The importance of having fathers available and present is indicated by the higher incidence of both internalizing and externalizing behaviors if an adolescent perceives themselves to have a distant relationship with their father, and they view him as being uninvolved in their life (Eggebeen, 2008). Research by Ohannessian et al. (2005) found similar results with regard in that adolescents with an alcohol-dependent father were more likely to develop alcohol dependence themselves. A study by Coley, Votruba-Drzal, and Schindler (2009) also found evidence of the importance of an adolescent's relationship with their father regarding risky sexual behavior. The authors found that if fathers had more knowledge of peers and were more actively involved in family activities, girls had less risky sexual behaviors. Taken together, studies have indicated that both mothers and fathers appear to have a great influence on the behavior of adolescents, and that this influence may be different depending on the gender of the parent and the child.

Same sex parents and adolescents seem to spend more time together during adolescence than opposite sex parents and adolescents (Dubas, & Gerris, 2002), with sons having closer relationships to their fathers than daughters (Hawkins et al., 2006). Opposite sex child-parent relationships have been found to be more stressful than same sex relationships, and may have a different impact on an adolescent's problem behaviors than same-sex relationships (McBride, Schoppe, & Rane, 2002). Eggebeen (2008) found that a lack of involvement from fathers was more impactful with regard to depression in girls, and a lack of involvement from mothers was more impactful with delinquent behavior in boys.

In general, girls appear to have a higher level of instability (Van Wel et al., 2002) and conflict (Wu et al., 2004) in relationships with their parents, but these relationships are also closer and more dependent (Geuzaine, Debry, & Liesens, 2000). This research fits in with previously discussed sex-role stereotypes wherein girls are socialized to be more obedient and less independent than boys (Leahy, 1981). In addition to this research, gender differences also have been acknowledged with regard to risk and protective influences of family on internalizing behaviors such as anxiety and depression and externalizing behaviors such as alcohol use (Husler & Plancherel, 2006; Marshal & Chassin, 2000). Although one of the aspects of this dissertation is to examine gender differences related to protective influences from family and peers, it is also important to examine gender differences with regard to risk in order to have a complete understanding.

Risk Factors. Husler and Plancherel (2006) noted that there is some evidence that boys experience anxiety more as a result of family relationships, whereas girls are more impacted by their family with regard to alcohol use (Yeh, Chiang, &

Huang, 2006). A study by Levpuscek (2006) with a community sample of 495 adolescents in grades 7-12 found that girls are better able to individuate from their family than boys. As difficulty with establishing autonomy has been linked to anxiety (Cicchetti, & Rogosch, 2002), this could be related to the greater impact of family relationships on boys than girls. Girls are also monitored more closely than boys (Barnes et al., 2000; Li et al., 2000; Webb et al., 2002), but in some families this is not the case and could put girls at risk (Crosnoe, Erickson, & Dornbusch, 2002). This is evidenced in a study conducted by Rose et al. (2001) where alcohol use in girls was found to be impacted by low parental monitoring.

Gender differences also have been found related to family support. In boys, a low level of support was found to have an inverse relationship with depression (Rowan, 2001), but the opposite was found to be true with regard to alcohol use (Marshal & Chassin, 2000). In their study with 303 adolescents, half of which had a history of parental alcoholism, Marshal and Chassin (2000) found that support and consistent discipline from parents actually increased the likelihood that boys who had alcohol using peers would use alcohol themselves. The authors attributed this to the possibility that boys perceived their parent's support and discipline as a threat to their autonomy and independence. As boys are socialized to be more autonomous, they may view limit setting as inhibiting their ability to fulfill more masculine sex-role stereotypes. If boys view limit setting as a threat to their autonomy, they may rebel against the limits by trying to relate more to their peers, which may include becoming involved in deviant behaviors, such as alcohol use (Grusec & Goodnow, 1994). Thus, not surprisingly, Crosnoe et al. (2002) found a relationship between higher levels of

parental involvement and more frequent alcohol use among boys with alcohol using peers.

Taken together, the research indicates some gender differences with regard to internalizing and externalizing behaviors in adolescents. Whereas the alcohol use of girls seems to be inversely related to parental monitoring, the opposite seems to be true of boys in some findings. As it has been established that boys may have more difficulty with individuation from their family than girls (Levpuscek, 2006), perhaps these findings are related to that fact. It may be that because girls are more dependent and closer to their families than boys (Geuzaine et al., 2000), they may feel less inclined to rebel from support or discipline.

Protective factors. Some research has supported this notion in that girls with parents who were supportive and consistent with discipline (Marshal & Chassin, 2000) were less likely to use alcohol and be influenced by peers who used alcohol. The closer and more dependent relationships girls have with their families (Geuzaine et al., 2000) may also act as a protective mechanism with regard to protecting girls from internalizing behaviors. As attachment and intimacy in families have been found to act as a buffer protecting adolescents from internalizing behaviors (Dekovic, 1999; Field et al., 2002; Field et al., 1995), perhaps the fact that girls have closer relationships helps protect them from developing anxiety.

Boys also have been found to benefit from protective influences of family with regard to the development of internalizing behaviors. In a two phase study with 199 adolescents in the first phase and 179 in the second, Grossman, Beinashowitz, Anderson, Sakurai, Finnin, and Falherty (1992) found that boys who had stronger cohesion and communication with their mother had lower levels of distressed

mood/depression. Less depression in boys was also found in relation to higher levels of family satisfaction (Corona, Lefkowitz, Sigman, & Romo, 2005). As a whole, research indicates that there are gender differences in the way families put adolescents at risk, and also protect them from the development of anxiety and alcohol use. In addition to research on familial influence, gender differences also have been found with regard to risk and protective influences of peers on anxiety and alcohol use in adolescents.

Peers, Anxiety, Alcohol Use, and Gender Differences

Overall, gender differences have been found regarding the influence peers have on both internalizing behaviors such as anxiety (Rose & Rudolph, 2006; Yeh et al., 2006) as well as externalizing behaviors such as alcohol use (Gaughan, 2006) in adolescents. Based on the sex-role stereotypes previously discussed, peers have been found to favor boys with more masculine characteristics and girls with more feminine characteristics (Hibbard & Buhrmester, 1998; Massad, 1981). Peers also have been found to have both risk (Crosnoe et al., 2002; Dick, Pagan, Holliday, Viken, Pulkkinen, Kaprio, & Rose, 2007) and protective factors (La Greca & Lopez, 1998; Way & Greene, 2006) that differ by gender.

Risk Factors. Overall, adolescents of both genders have been found to be influenced by their peers to use alcohol (Crosnoe et al., 2002; Yeh et al., 2006). Research using data from a longitudinal twin study found that boys and girls who had a mixture of opposite and same sex peers were found to drink more alcohol than those with only same sex peers (Dick et al., 2007). Other research found that in mixed sex friendships, the boys influenced the drinking behavior of the girls, but the reverse was

not true (Gaughan, 2006), whereas those in same sex friendships had a reciprocal influence on one another.

Some research has indicated that boys are more influenced by their peers than girls with regard to alcohol use, whereas other research has found the reverse to be true. In some instances, boys have been found to be more influenced by their peers to drink alcohol (Crosnoe et al., 2002) than girls. However, research has sometimes found that alcohol use in girls is more impacted by peers (Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001; Kandel, 1985) than alcohol use in boys. A study that examined gender differences related to drinking behavior in 771 adolescents found that alcohol use may be more impacted by peers in girls than boys because girls may be more concerned with peer norms, peer approval, and peer relationships than boys (Yeh et al., 2006).

This concern with peer norms, approval, and relationships also has been found to contribute to more anxiety in girls than boys (Rose & Rudolph, 2006). Girls tend to feel unsure about how to manage themselves with regard to their peer relationships thus contributing to their feelings of anxiety (Husler & Plancherel, 2006). In addition, girls tend to have more fears related to social situations and negative evaluation from peers than boys (Essau, Conradt, & Petermann, 1999; La Greca & Lopez, 1998), making them more apt to experience stress in new environments and avoid situations that have a social component to them (La Greca & Lopez, 1998).

Protective Factors. Although girls experience higher levels of anxiety than boys due to their peer relationships, they are also found to have a higher number of friendships (Kandel, 1985) and to rely on friends for support more than boys (Levpuscek, 2006). Girls also have reported that their friendships are closer (La

Greca, & Lopez, 1998), and more supportive (Cheng & Chan, 2004). In addition, girls have typically reported friendships that have greater intimacy than friendships experienced by boys (Johnson, 2004; Repinski & Zook, 2005; Underwood & Buhrmester, 2007; Verkuyten & Masson, 1996). Although it has been found that boy's friendships do experience an increase in intimacy as adolescence progresses, the level of intimacy is not at the same level as that found in girl's friendships (Johnson, 2004).

Related to this, girls have been shown to have more of a connection with their peers, and have more of a need for a connection than boys (Zarbatany, Conley, & Pepper, 2004). When compared with boys, girls also have been found to have friendships of a higher quality, measured by components such as support, security, trust, and closeness (Brendgen, Markiewicz, Doyle, & Bukowski, 2001; Wissink, Dekovic, & Miejer, 2009). Some research, however, indicated that this is only true in boys who are at the age when they have just begun high school. A longitudinal study conducted with 206 adolescents found that by the time boys are in their senior year of high school, they reported having a level of quality to their friendships, marked by emotional support and satisfaction, similar to that of girls (Way & Greene, 2006). Despite this finding, the research overwhelmingly supports the notion that girls have friendships that are more supportive, intimate, and closer than boys. This is especially meaningful when considering the fact that protective factors within friendships have been found to act as a buffer to adolescents with regard to internalizing disorders and alcohol use.

Research has found qualities such as trust and peer support to buffer adolescents from internalizing behaviors such as depression (Chester et al., 2007; Way

& Chen, 2000). Other research has found that adolescents with positive peer relationships had less externalizing behaviors such as alcohol use (Scholte et al., 2001). Thus, if girls have higher quality of friendships than boys, than perhaps these relationships act more as a buffer for them than boys with regard to anxiety and alcohol use.

Problem Behaviors and Gender Differences

Overall, girls have been found to be more inner directed, and boys more outer directed with regard to how they deal with their problems (Cicchetti & Rogosch, 2002). Individuals who are more inner directed tend to have more problems with qualities such as self-esteem, and have a higher probability of internalizing disorders such as anxiety (Cicchetti & Rogosch, 2002). Those who are outer directed have more problems with externalizing behaviors, such as aggression (Cicchetti & Rogosch, 2002) or the use of alcohol such as alcohol.

Anxiety. In general, anxiety, including state and trait anxiety, in adolescents has been found to be more prevalent among girls than among boys (Bittner, Egger, Erkanli, Costello, Canals, Marti-Henneberg, Fernandez-Ballart, Cliville, & Domenech, 1992; Deas, St Germaine, & Upadhyaya, 2006; del Barrio, Moreno-Rosset, Lopez-Martinez, & Olmedo, 1997; Essau et al., 2000; Foley & Angold, 2007; Husler & Plancherel, 2006; Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998; Muris, Rapee, Meesters, Schouten, & Geers, 2003; van Brakel et al., 2006). In addition, a community sample of 1,507 adolescents found that girls have a higher prevalence of multiple anxiety disorders than boys (Lewinsohn et al., 1997), and have been found to have more specific types of anxiety such as social phobia

(Inderbitzen & Hope, 1995) and panic disorder (Reed & Wittchen, 1998). As discussed previously, girls experience more uncertainty in their friendships and more fear of social situations than boys (Essau et al., 1999; Husler & Plancherel, 2006). In lieu of this, it is not surprising that a higher number of adolescent girls than boys are diagnosed with social phobia (Costello et al., 2003; Inderbitzen & Hope, 1995; LaGreca & Lopez, 1998; Myers, Aarons, Tomlinson, & Stein, 2003; Stein & Stein, 2008; Wittchen, Stein, & Kessler, 1999). In addition to girls having higher levels of anxiety than boys (Bittner et al., 2007), studies also have shown that the stability of anxiety over time may be higher in girls than boys (Costello et al., 2003; Ferdinand et al., 2007).

Whereas this review of studies indicates that girls are more prone to internalizing disorders such as anxiety, it is indicated that boys are more prone to externalizing disorders such as alcohol use.

Alcohol use. Numerous studies have supported the notion that externalizing disorders such as alcohol use are more prevalent in boys (Grunbaum, Tortolero, Weller, & Gingiss, 2000; Myers et al., 2003). More specifically, boys have been found to have higher levels of alcohol use than girls (Barnes et al., 2000; Dick, Rose, Pulkkinen, & Kaprio, 2001; Foxcroft & Lowe, 1995; Stewart & Power, 2003; Webb, Bray, Getz, & Adams, 2002), to misuse alcohol more (Hawkins et al., 1997), and to have more instances of binge drinking and drinking that was problematic (Cardenal & Adell, 2000). A study examining 2,140 seventh and eighth graders also found that boys have a greater increase in the consumption of alcohol as they got older (Cardenal & Adell, 2000), and were found to move faster to frequent drinking after drinking initiation when compared to girls (Rose et al., 2001). In addition to sole

alcohol use, boys were also found to have more polydrug use, including the use of cigarettes, alcohol, and marijuana (Epstein, Botvin, Griffin, & Diaz, 1999) than girls.

Some research found that girls initiated drinking at an earlier age than boys (Rose et al., 2001), and had higher levels of initial alcohol use (Duncan et al., 1995). However, despite the earlier age and levels of initial alcohol use, girls progressed with their alcohol use at a slower rate than boys (Duncan et al., 1995), and overall had a lower chance of developing an alcohol use disorder (Roberts, Roberts, & Xing, 2007). Other research, contrary to these findings, indicated that girls may be at a greater risk of developing alcohol abuse or alcohol dependence than boys (Chen, Killeya-Jones, & Vega, 2005). Perhaps this is because girls have been found to use substances such as alcohol as a way to emotionally escape more than boys (Opland, Winters, & Stinchfield, 1995). Although boys have been found to have higher levels of alcohol use than girls (Grunbaum et al., 2000), many studies indicated that there were not gender differences with regard to the stability of alcohol use over time (Blozis et al., 2007; Koppes et al., 2000; Shillington & Clapp, 2000; Toumbourou et al., 2003). Whereas research has examined gender differences with regard to anxiety and alcohol use separately, there is a paucity of research that has examined gender differences with regard to the association between anxiety and alcohol use.

Association between anxiety and alcohol use. One longitudinal, community study with 1,420 children who were 9-13 at intake and then assessed every year until they were sixteen did find that girls with anxiety may be more prone to using alcohol whereas this was not found to be true for boys (Costello et al., 2003). As research has indicated gender differences with regard to ways in which both family and peers protect adolescents from anxiety and alcohol use, it supports the notion that

these are important influences to consider when looking at the association between these two variables further emphasizing the usefulness of the Ecological Risk/Protective Theory, The Interactional Theory of Delinquency, and Stress-Buffering Hypothesis in examining these relationships. Because a paucity of studies already exists with regard to looking at the association between anxiety and alcohol use in an adolescent population, a gap also exists with regard to the impact of gender on this relationship. As exemplified in this section, gender differences have been noted throughout the literature with regard to protective influences from family and peers. In addition to these findings, racial differences also have been found with regard to these protective influences.

Racial Differences

Family, Anxiety, Alcohol Use, and Racial Differences

Various studies have indicated some racial differences with regard to families, adolescents, anxiety, and alcohol use (Davalos et al., 2005; Giordano, Cernkovich, & De Maris, 1993). This review will concentrate on racial differences in risk and protective factors with regard to family influence in Caucasian, African American, and Hispanic adolescents. Similar to previous sections, although this dissertation is concentrating on protective influences, the exploration of both risk and protective factors will provide a comprehensive understanding of racial differences in this population.

Risk factors. Overall, research has indicated that Caucasian adolescents may have more familial risk factors, such as family conflict, with regard to alcohol use than adolescents of other races (Wallace & Muroff, 2002). Studies also have found

that there are risk factors in families of different races with regard to anxiety, as indicated in a study with 97 African American children in fourth through sixth grades that found anxiety to be negatively related to social support from parents (Hill, Levermore, Twaite, & Jones, 1996). Some studies have found similarities among different races with regard to familial risk factors and anxiety, whereas other studies have found differences. A study by Varela, Sanchez-Sosa, Biggs, and Luis (2009) found that children in both Caucasian and Hispanic families were more anxious if there was more control from their mothers, and less acceptance from their fathers. The authors also found a negative association between family cohesion and anxiety among these racial groups. Other studies have found differences with regard to familial risk factors and anxiety. A study by Hill and Bush (2001) found that lower levels of parental self-efficacy (defined as the level of confidence individuals have in their parental skills), was related to more anxiety in African American, but not Caucasian children. A study with 100 African American and 120 Caucasian young adults also found racial differences in familial risk related to anxiety in that family functioning was found to be a risk factor for anxiety in Caucasian, but not African American subjects (Chapman & Woodruff-Borden, 2009).

With regard to alcohol use, a study with 142 African American adolescents, and 308 Caucasian adolescents by Peterson, Hawkins, Abbot, and Catalano (1994) found that African American parents were less likely to use alcohol. Contrary to this, a study with 919 Caucasian, African American, and Asian preadolescents found that Caucasian parents were more tolerant of alcohol use (Gillmore, Catalano, Morrison, Wells, Iritani, & Hawkins, 1990). It has been shown that parents who have higher levels of approval of alcohol use put adolescents at risk

for using alcohol (Catalano et al., 1992). Taking into account racial differences, Catalano et al. (1992) found support for the fact that Caucasian parents are more tolerant of alcohol use, and as a result their findings indicated that Caucasian adolescents were at a higher risk for alcohol use due to their parents' higher level of acceptance of alcohol use. Although examining drug use rather than alcohol use, other studies have found racial differences with regard to other family characteristics that may put adolescents at risk. A study with 455 African American families by Myers, Newcomb, Richardson, and Alvy (1997) found that parental neglect and indifference were associated with initiation of alcohol use among the individuals in their sample. Gil, Vega, and Biafora (1998) found similar results related to initiation of alcohol use among Hispanic and Caucasian adolescents. Gil et al. (1998) found that low family cohesion among Hispanic and low communication with parents among Caucasian adolescents was associated with initiation of drug use. Contrary to findings by Myers et al. (1997), Gil et al. (1998) found less family risk with regard to alcohol use among African American adolescents when compared to use among Hispanic or Caucasian adolescents.

Protective factors. Expanding upon the above findings, Hispanic and African American adolescents appear to be more protected with regard to family influence on anxiety and alcohol use than Caucasian adolescents. With regard to Hispanic families, a study with 800 adolescents of various races with a mean age of sixteen found that Hispanics had more respect toward their families, and assisted and supported them more than Caucasian students (Fuligni, Tseng, & Lam, 1999). This resulted in more positive family and peer relationships for Hispanic adolescents than Caucasian adolescents. In lieu of these findings, it is not surprising that a study

looking at the adjustment of Hispanic adolescents found that boys who had higher levels of family satisfaction had less depression symptoms (Corona et al., 2005).

Regarding African American families, Giordano et al. (1993) found higher levels of intimacy and control with regard to the family relationships of African American versus Caucasian adolescents. Parental support among African American parents also has been found to be associated with less anxiety, as indicated in a longitudinal study with 173 African American boys by Zimmerman et al., (2000). In addition, parental support was found to be inversely associated with substances, such as alcohol use in a sample of 297 African American adolescents (Wills et al., 2003). Chester et al. (2007) also found similar results with their study with 242 dyads of African American mothers and children. The authors found that positive parenting, defined as monitoring and maternal warmth/support, was associated with less depressive symptoms among children/adolescents in the study. Parental strictness also has been found to be related to better coping skills and an increased ability to control anger in African American adolescents (Clark, Novak, and Dupree, 2002).

Taken together, the research indicates that the families of Hispanic and African American adolescents have some protective factors with regard to both anxiety and alcohol use. These findings seem to support the Ecological Risk/Protective Theory, The Interactional Theory of Delinquency, and the Stress-Buffering Hypothesis in that family can have a protective influence on these populations. As research has not examined racial differences related to protective influences regarding the association between anxiety and alcohol use, these theories will be useful to help guide this research. If we examine these studies, it may be hypothesized that families of Hispanic and African American adolescents will have a stronger buffering effect on

the association between anxiety and alcohol use. However, this hypothesis should be stated with caution due to the paucity of research that exists between the impact of ethnicity on anxiety and alcohol use separately. Thus, it may be difficult to truly hypothesize how race will impact this buffering effect. Whereas research indicates racial differences with regard to family influence on anxiety and alcohol use in adolescents, studies also have indicated that there are racial differences with regard to peer relationships (Bradizza et al., 1999; Wallace & Muroff, 2002).

Peers, Anxiety, Alcohol Use, and Racial Differences

This part of the review will examine racial differences with regard to the risk and protective factors of peers on anxiety and alcohol use in adolescents.

Risk Factors. Overall, when compared with African American adolescents, Caucasian adolescents have been found to get drunk on a more frequent basis, to have more friends who drink, and to be more influenced by their peers to use alcohol (Barnes, Farrell, & Banerjee, 1994; Wallace & Muroff, 2002). A qualitative study of 300 African American and Haitian adolescents in grades nine to twelve in inner city Boston, identified one of the reasons African American adolescents may be less influenced by their peers to use alcohol (Strunin, 1999). The author found that African American adolescents in their study were concerned about remaining in control, which prohibited them from using alcohol in excess. Perhaps this decreases their risk with regard to peer influence.

Protective Factors. Similar to previous studies that discussed gender differences in friendships, research by Way and Chen (2000) indicated racial and gender differences in their findings that Hispanic and African-American girls reported

more friendship support than boys of these racial backgrounds. African American adolescents are also found to be less influenced overall by their peers (Giordano et al., 1993), and are not as influenced to drink with peers when compared with Caucasian adolescents (Stewart & Power, 2003). African American adolescents also have been found to have less of a need for peer approval when compared to Caucasian adolescents (Urberg et al., 1997). In addition to peer support being associated with anxiety, friendship quality also has been inversely associated with this internalizing behavior (Demir & Urberg, 2004). As a qualitative study with 213 adolescents found that Hispanics had higher quality of friendship than African Americans, it can by hypothesized that Hispanics may also experience the buffering components of friendship (Way, Cowal, Gingold, Pahl, & Bissessar, 2001).

Problem Behaviors and Racial Differences

Differences in race have been noted with regard to both anxiety and alcohol use in adolescents of different races. Many more studies have been conducted with regard to alcohol use and adolescents of different races, but there is a lack of studies that have examined racial differences in the association between anxiety and alcohol use.

Anxiety. The studies on racial differences with regard to anxiety and other internalizing behaviors in adolescents are mixed. A study with a community sample of 4,175 adolescents between the ages of eleven and seventeen of diverse racial backgrounds found that Caucasian adolescents were at a lower risk of developing an anxiety disorders than adolescents of other races in the sample (Roberts et al., 2007). Similarly, Chen et al. (2005) found that African American adolescents reported higher

levels of anxiety than adolescents of other races. When compared to Hispanic adolescents, African-American adolescents have been found to report a higher level of well-being than Hispanic adolescents (Way & Chen, 2000). In their study with 160 ninth grade African-American, Hispanic, and Asian American adolescents, Way and Chen, 2000 measured well-being with a composite score combining self-esteem and depression.

Studies also have found racial differences with regard to specific types of anxiety (Compton, Nelson, & March, 2000; Last & Perrin, 1993). A study with a treatment sample of thirty African American and thirty-nine White children ages five to seventeen found that Caucasian children had higher levels of school refusal (Last & Perrin, 1993). Another study conducted by Compton et al. (2000) found differences with regard to social phobia and separation anxiety, with Caucasian children having higher levels of social phobia, and the reverse being true for separation anxiety. A study with 99 Hispanic children and 143 Caucasian children by Ginsburg and Silverman (1996) also found lower levels of separation anxiety among the Caucasian children in the study. As a whole, the studies indicate some differences with regard to race and anxiety. Although some differences have been noted with regard to anxiety disorders in individuals of different races, Safren et al. (2000) stated the importance of conducting further studies on anxiety in minority populations due to the paucity of studies that exist. Whereas there are studies as outlined above that have found racial differences related to anxiety, there are a lack of studies looking at the impact of race on the stability of anxiety over time. Thus, this dissertation will be expanding current research by examining not only the impact of race on anxiety, but also the ways in which race effects the stability of anxiety over time.

Alcohol use. Overall, it is widely indicated that Caucasian adolescents have higher levels of alcohol use than African American adolescents (Blum, Beuhring, Shew, Bearinger, Sieving, & Resnick, 2000; Johnston et al., 2009). Hispanic adolescents have rates of alcohol use, both alcohol and drug use, in the middle of these two groups (Johnston et al., 2009; O'Malley et al., 1998). These findings have been supported through longitudinal studies, such as a study by Bray et al. (2001) with 6,522 diverse adolescents, and Getz and Bray (2005) with 3,675 diverse adolescents. Prospective studies by Myers et al. (2003) with 724 adolescents, and a study by Stewart and Power (2003) with a community sample of 1,874 adolescents also have supported these findings. Caucasian adolescents also have higher levels of polydrug use than adolescents of other races (Epstein et al., 1999). In addition, Caucasian adolescents also have been found to initiate alcohol use earlier than adolescents of other races (Hawkins et al., 1997), and have been found to be more likely to use alcohol for social reasons as opposed to as a coping mechanism which has been found with African American adolescents (Bradizza et al., 1999). With regard to alcohol use over time, a study by Shillington and Chapp (2000) found that adolescents of different races did not seem to differ with regard to the stability of their alcohol use.

Association between anxiety and alcohol use. Whereas there is some research related to racial differences regarding anxiety and alcohol use, there is a dearth of research that has examined racial differences related to the association between these two constructs. One study by Valentiner, Mounts, and Deacon (2004) that was conducted with 399 college freshman indicated that African American individuals who had panic attacks had higher levels of alcohol use than Caucasian individuals with panic attacks. Because racial differences have been found related to

the association between anxiety and alcohol use, it is imperative to further investigate these differences with regard to the impact of different types of anxiety and alcohol use. Moreover, research using an adolescent sample will further extend these studies.

Taking all of this research together, it becomes clear that there are racial differences with regard to both anxiety and alcohol use. The studies on racial differences related to alcohol use in adolescents are more prevalent and provide more consistent findings than that of anxiety. Regardless, racial differences related to the association between anxiety and alcohol use has been understudied, thus this dissertation will help bridge this gap. In addition, because there is also a gap in the studies regarding the buffering impact of family and peers on the association between anxiety and alcohol use, there is also a scarcity of studies examining the racial differences in these protective mechanisms. The Ecological/Risk Protective Theory, The Interactional Theory of Delinquency, and the Stress-Buffering Hypothesis are again valuable theories with which to guide this discussion.

Conclusion

In conclusion, taken together the studies examined in this review clearly indicate that anxiety and alcohol use have been found to remain stable over time, and that there is an association between these two constructs in adolescents. Furthermore, a temporal relationship between anxiety and alcohol use has been identified wherein anxiety precedes alcohol use in most studies. Studies also show that there are family and peer mechanisms that buffer the impact and development of both anxiety and alcohol use in this population. In addition, gender and race differences also have been found with regard to anxiety and alcohol use.

Despite these findings, as indicated throughout this literature review, although gender differences have been found related to stability of anxiety, none have been found regarding the stability of alcohol use over time. Thus, it would be beneficial for more research to be conducted on the gender differences regarding the stability of anxiety and alcohol use over time in order to ascertain similarities or differences to current findings. In addition, racial differences related to the stability of anxiety over time have not been explored, and studies investigating racial differences and stability of alcohol use over time are sparse. Consequently, examining any racial differences impacting stability of anxiety and alcohol use over time are also warranted.

Similarly, although a relationship between anxiety and alcohol use, including a temporal relationship between these constructs has been identified, studies also have failed to comprehensively examine the impact of gender and race on this relationship. Therefore, examining gender and race differences with regard to the relationship between anxiety and alcohol use will also further research as these differences have been studied more in terms of these constructs separately instead of the association between them.

Different studies also have clearly identified family variables that have been found to buffer the impact of anxiety and alcohol use in adolescents. However, these variables have been investigated as separate measures, and have not been investigated with regard to how they may protect adolescents with regard to the association between these constructs. As the previous paragraph summarized the fact that a clear association has been indicated between anxiety and alcohol use, looking at the buffering impact of the family seems to be a logical progression to further the studies. Furthermore, family variables such as parental communication with mother

and father, family satisfaction, and parental limit setting have not been as widely investigated as other variables like cohesion and parental monitoring. Thus, using these variables to study the association between different types of anxiety and alcohol use will also help further research in this area.

In addition to family variables acting as buffers, research also indicates that are peer variables that act to buffer the development of anxiety and alcohol use in adolescents. However, similar to the studies on family variables, there is a gap in the research with regard to how peer variables can buffer the relationship with regard to the association between anxiety and alcohol use in adolescents. Utilizing the peer variables of social competence and support from a close friend to explore how peer variables can buffer this relationship will help extend the research in this area.

As the Ecological Risk/Protective Theory indicates that there are many levels in an adolescent's life that may protect them, it will be useful to use this theory to investigate the ways in which both family and peer variables may buffer the association between anxiety and alcohol use. Furthermore, as the Stress-Buffering Hypothesis indicates that a person's environment can act to buffer individuals from stressful situations, it will be beneficial to also use this theory to guide the investigation of the potential ways family and peers can act to buffer the anxiety/alcohol use association.

Research Questions

Considering The Ecological Risk/Protective Theory, The Interactional Theory of Delinquency, and Stress-Buffering Hypothesis together, it can be hypothesized that support from family and peers will moderate the association between anxiety and alcohol use in adolescents. These relationships will make it less

likely that anxiety will be associated with alcohol use. Thus, utilizing these three theories to guide this dissertation, the following research questions will be investigated:

1-To what extent do anxiety and alcohol use change over time during adolescence?

2-Is anxiety related to alcohol use over time during adolescence?

3-Does anxiety predict alcohol use and/or does alcohol use predict anxiety during adolescence?

4-Do family variables (parental communication with mother and father, family satisfaction, and parental limit setting) moderate the association between anxiety and alcohol use during adolescence?

5-Do peer variables (social support from a close friend, and social competence) moderate the association between anxiety identified previously and alcohol use during adolescence?

These questions will also be examined with regard to gender and racial differences.

Chapter 3

METHODOLOGY

Overview

This dissertation examined the patterns of change over time with regard to anxiety and alcohol use during adolescence, as well as the association and bidirectional relationship between these constructs. In addition, this dissertation explored the moderating effects of family (communication with mother and father, family satisfaction, parental limit setting) and peer variables (social support, social competence) on the association between anxiety and alcohol use. Gender and racial differences were also investigated with regard to patterns of change over time, the overall relationship between anxiety and alcohol use, the bidirectional relationship between these two constructs, and the buffering effect of family and peer variables.

Participants

Data for this study were drawn from a five year longitudinal study, The Adolescent Adjustment Project (Ohannessian, 2009a; Ohannessian, 2009b) that was designed to examine the factors that contribute to the differences in adjustment among adolescents with alcoholic parents. Data for this project were collected in four Waves beginning in the spring of 2006 and ending in the spring of 2009. This dissertation utilized data from Waves 2 and 3 which were collected in the spring of 2007 and 2008 (herein referred to as Time 1 and Time 2, respectively). The dissertation did not include data from Wave 1 because the sample size was much lower for this Wave than

the other available Waves. Passive parental consent, which will be discussed in an upcoming section, was implemented from Waves 2 onward, which increased the sample size. Thus, in order to have the largest sample size possible for the analyses in this dissertation, Wave 1 was excluded. The sample that was utilized from Times 1 and 2 included 559 adolescents who were 15-17 at Time 1 and 16-18 at Time 2. The attrition rate from the larger sample at Time 1 to the sample utilized in this dissertation was 46%. The mean age of the sample at Time 1 was 16 (SD = .67) and 17 at Time 2 (SD = .68). Fifty-nine percent of the participants were girls. The racial breakdown of the sample was 70% Caucasian, 19% African American, and 11% Latino. At Time 1, all of the participants in this sample were in the 10th or 11th grade in a public high school in Delaware, Pennsylvania, or Maryland.

Procedures

Subjects were recruited for this study by contacting public high schools in Delaware, Pennsylvania, and Maryland, and inviting them to participate. Passive parental consent and adolescent assent were the types of consent utilized in this study. Passive parental consent was approved by the University of Delaware's human subjects committee for Waves 2 onward. The passive consent process consisted of letters being mailed to all of the parents of the adolescents in the schools prior to researchers going out to collect data. A cover letter was sent to the adolescent's home with information about the study. If parents did not want their children to participate in the study, they were asked to contact the research project by mail, phone, or email. In the spring of 2007 and 2008, adolescents whose parents gave consent were given an assent form immediately prior to data collection where they could indicate whether or not they were interested in participating in the study. The assent form contained the

same information as the letter that was mailed to the adolescent's parents. If adolescents indicated assent and their parents gave consent, then they were given a self-report survey to complete. The surveys were distributed by research personnel who had received human services training, and background information on the survey. The surveys took about 40 minutes for the adolescents to complete. Each student who completed a survey was given a movie pass.

Ethics and Confidentiality

As previously indicated, parental consent and adolescent assent were obtained before surveys were distributed. Both the parental consent and adolescent assent forms included a description and purpose of the study, as well as information regarding confidentiality. Before administering the surveys, adolescents were told that their information was confidential, and that participation in the survey was voluntary. The subjects were also informed that they had the right to withdraw from the study any time that they chose to. This study has a Certificate of Confidentiality from the U.S. government in order to closely protect data that is collected, so the subjects were informed of this as well.

Measures

The self-report surveys that were distributed to the adolescents included information related to psychological problems, family communication, family satisfaction, parental limit setting, self-perception, support systems, parental drinking behavior, technology use, and adolescent substance use. The measures utilized for this dissertation (anxiety, alcohol use, parental communication, family satisfaction, parental limit setting, social support from a close friend, and social competence) will

be outlined in the following section. Data from the anxiety and alcohol use measures from both Times 1 and 2 were used in this dissertation, whereas data from Time 1 only were used for the remaining measures (parental communication with mother and father, family satisfaction, parental limit setting, social support from a close friend, social competence, and the covariates depression, and maternal and paternal alcoholism).

Anxiety

Adolescents' anxiety was assessed through self-report questionnaires that were distributed to the participants. Anxiety was measured by the 41-item Screen for Child Anxiety Related Disorders (SCARED; Birmaher, Khetarpal, Cully, Brent, & McKenzie, 1995). The SCARED includes statements such as "I feel nervous with people I don't know well", "When I get frightened, my heart beats fast", and "I worry about things that have already happened". Individuals taking the SCARED were asked to respond to statements based on their feelings over the past three months. There are three response choices for this measure, including 0 = not true or hardly ever true, 1 = somewhat true or sometimes true, and 2 = very true or often true. The SCARED measures overall anxiety, as well as specific types of anxiety including social phobia, separation anxiety disorder, school phobia, panic disorder, and generalized anxiety disorder. For the purposes of this study, the total overall anxiety score was used. This variable was represented by a composite score devised by summing the forty-one questions from the SCARED.

The SCARED has been shown to have good reliability and validity. Muris, Merckelback, Ollendick, King, and Bogie (2002) found the SCARED to have good internal consistency with an alpha coefficient of .91. Linyan, Kai, Fang, Yi, and

Xueping (2008) found the measure to have good discriminant validity between anxiety and non-anxiety disorders, whereas Birmaher, Brent, Chiapetta, Bridge, Monga, and Baugher (1999) found similar results between anxiety and depressive disorders, anxiety and disruptive disorders, and between different types of anxiety disorders. There is a paucity of literature that exists examining the reliability of the SCARED for different genders and races. One study by Boyd, Ginsburg, Lambert, Cooley, and Campbell (2003) did examine the reliability of the SCARED for African Americans adolescents, and found good internal consistency (alpha coefficient of .89) for their sample. Boyd et al. (2003) also found the SCARED to have an alpha coefficient of .47 for test-retest reliability over a six month period of time.

For the purposes of this dissertation, alpha coefficients were calculated for all of the measures first for the overall sample, and then by gender and race. Alpha coefficients for the SCARED for the overall sample were .94 for both Time 1 and Time 2. Alpha coefficients were .94 and .95 for boys at Time 1 and Time 2 respectively, and .93 for girls at both times of measurement. When examining the SCARED by race, it was found that the alpha coefficients were .94 for Caucasian adolescents, .93 for African American adolescents, and .94 for Hispanic adolescents at both times of measurement.

Alcohol Use

A quantity x frequency index for alcohol consumption was used to indicate alcohol use. Both quantity and frequency of alcohol use were measured through the Alcohol Use Survey. As part of this survey, the adolescents in the sample were asked eleven questions related to the quantity and frequency of alcohol that they used over the past six months. The responses to five of these eleven questions asked

respondents to fill in the number of times that they drank beer, wine, or liquor. The responses to the remaining six questions utilized a likert scale format with response categories ranging from 0 = no beer/liquor to 9 = more than 8 cans/bottles/glasses per day to measure quantity, and 0= never to 7 = every day to measure frequency.

Three of the questions in this likert scale format focused on quantity, and three focused on frequency. Examples of questions that focused on quantity of alcohol use included, "When you had wine, on the average day, how much did you usually drink in the last 6 months?", and "When you had beer, on the average day, how much did you usually drink in the last 6 months?" Examples of questions for frequency of alcohol use included, "How often did you usually have a beer in the last 6 months?", and "How often did you usually have wine or wine coolers in the last 6 months?" Only the six questions with responses in the likert scale format were utilized to develop the alcohol use variable that will be used in this dissertation. The answers for the quantity and frequency questions were summed separately, and then these two values were multiplied together to indicate alcohol use.

Alpha coefficients for alcohol use for the overall sample in this dissertation were .84 and .79 for Time 1 and Time 2 respectively. Alpha coefficients were .81 and .72 for boys, and .86 and .85 for girls at Time 1 and Time 2, respectively. When examining alcohol use by race, alpha coefficients were .83 and .77 for Caucasian adolescents, .83 for African American adolescents at both Time 1 and Time 2, and .82 and .85 for Hispanic adolescents for Time 1 and Time 2 respectively.

Parental Communication

In the self-report survey, parental communication with mother and father was assessed through the Parent-Adolescent Communication Scale (PACS; Barnes &

Olson, 1982). The PACS is a 20-item measure that includes ten statements related to open communication with mother and father and ten statements related to problem communication with mother and father. Some of the statements that measure open communication include "I find it easy to discuss problems with my mother/father", and "I am very satisfied with how my mother/father and I talk together". Examples of the statements that measure problem communication are "I am sometimes afraid to ask my mother/father for what I want", and "When we are having a problem, I often give my mother/father the silent treatment". The response scale for the PACS is a 5-point likert scale ranging from 1 = strongly disagree to 5 = strongly agree. For this study, two separate composite scores were created, one for communication with mother and one for communication with father. As this measure is set up with a combination of positively and negatively worded questions, the negatively worded questions were recoded into positive values. A composite score was then derived by adding up the total of the values for communication with mother, and the total of the values for communication with father. This composite score included responses to all 20 items, those pertaining to both open and problem communication.

The PACS has been shown to have good internal consistency for the open communication scale, yielding a .87 alpha coefficient (Barnes & Olson, 1982). Jackson, Bijstra, Oostra, and Bosma (1998) examined the questions pertaining to open communication with mother and father separately finding alpha coefficients of .83 and .85, respectively. Good internal consistency was also found for the problem communication scale, with an alpha coefficient of .78 (Barnes & Olson, 1982). Other results have found alpha coefficients of .65 and .67 related to problem communication with mother and father (Jackson, et al., 1998). The measure also has been found to

have good test-retest reliability over a four to five week period of time, with alpha coefficients of .78 for open communication and .77 for problem communication reported in a study by Barnes and Olson (1982).

Similar to the SCARED, it was found that there was a scarcity of research that examined the reliability and validity of the PACS by gender and race. Two investigations (Knight, Tein, Shell, & Roosa, 1992; Sales, Milhausen, Wingood, DiClemente, Salazar, and Crosby, 2008) have examined the PACS with regard to racial differences, using samples of African American and Hispanic adolescents respectively. The study by Sales and colleagues (Sales et al., 2008) also examined this measure with regard to gender. More specifically, Sales et al. (2008) conducted a study with 522 African American female adolescents ages 14-18. The authors found that the PACS displayed good internal consistency (.88 at baseline, .89 at 6 month follow up, and .90 at 12 month follow up), whereas the alpha coefficients for test-retest reliability were lower (.58 between baseline and 6 month follow up, and .53 between baseline and 12 month follow up). The PACS was also found to have good construct validity in a study conducted by Knight et al. (1992) which utilized a sample of Hispanic children 8—14 years old.

Alpha coefficients for the sample in this dissertation were conducted separately for communication with mother and father. The alpha coefficient for communication with mother for the overall sample was .92, whereas boys and girls yielded alpha coefficients of .91 and .93 respectively. When examining communication with mother by race, it was found that the alpha coefficients were .93 for Caucasian adolescents, .89 for African American adolescents, and .77 for Hispanic adolescents. The alpha coefficient for communication with father for the overall

sample was .92, whereas boys and girls yielded alpha coefficients of .93 and .91 respectively. When examining communication with father by race, it was found that the alpha coefficients were .94 for Caucasian adolescents, .82 for African American adolescents, and .90 for Hispanic adolescents.

Family Satisfaction

Family satisfaction was assessed through the Family Satisfaction Scale (FSS; Olson & Wilson, 1982). The FSS is a 14-item measure that is used to measure a person's overall family satisfaction, adaptability, and cohesion. The FSS uses a 5-point likert scale with response categories ranging from 1 = dissatisfied to 5 = extremely satisfied. The responses start with the stem "How satisfied are you with", and include statements such as "How close you feel to the rest of your family?", "Your freedom to be alone when you want to?", and "How often parents make decisions in your family?" For this study, a composite score was developed for the family satisfaction measure by summing the responses to the 14 questions to derive a single score.

The FSS has been shown to have good validity (Underhill, LoBello, & Fine, 2004) and good reliability showing alpha coefficients of .94-.95 (Underhill et al., 2004). In addition, Olson and Wilson (1989) found alpha coefficients of .92 and .76 for larger and smaller samples, respectively. The FSS also been shown to have good test-retest reliability over a period of five weeks, with a test-retest reliability coefficient of .75 (Olson & Wilson, 1989).

The alpha coefficient for family satisfaction for the overall sample used in this dissertation was .89, whereas boys and girls yielded coefficients of .90 and .89 respectively. Few studies have examined the reliability and validity of the FSS by

gender and race. However, when examining family satisfaction by race for the sample used in this study, it was found that the alpha coefficients were .90 for Caucasian adolescents, .85 for African American adolescents, and .87 for Hispanic adolescents.

Parental Limit Setting

Parental limit setting was measured using the Parental Limit Setting Measure (PLSM; Turner, Irwin, & Millstein, 1991). The PLSM is a 16-item measure used to assess how much freedom parents/guardians give to adolescents for different activities. The measure has response choices of 1= "yes" and 0 = "no". The PLSM has two statement stems, including "Do your parents/guardians allow you to" and "Do your parents". Some of the statements associated with the stem "Do your parents/guardians allow you to" include "Decide on the type of clothes to wear", and "Go steady with a boy/girl friend." The statements associated with the stem "Do your parents" include "Check to see what you are doing when you are on the computer, watching t.v., or playing video games", and "Call you to check up on you." A composite score for parental limit setting was developed for use in this study. In the PLSM, there are some questions that have reverse phrasing, and thus were recoded accordingly.

There is limited research that exists examining the reliability and validity of the PLSM, and even more limited research examining the impact of gender and race on these components. A study by Walsh, Shulman, Bar-on, and Tsur (2006) did show the PLSM to have good reliability, with reported alpha coefficients between .85 and .92.

The alpha coefficient for parental limit setting for the overall sample used in this dissertation was .75, whereas boys and girls yielded coefficients of .72 and .76

respectively. When examining parental limit setting by race, it was found that the alpha coefficients were .58 for Caucasian adolescents, .76 for African American adolescents, and .83 for Hispanic adolescents.

Social Support From a Close Friend/Social Competence

Social support from a close friend and social competence were both measured using the Self-Perception Profile for Adolescents (SPPA; Harter, 1988). The SPAA is an extension of Harter's Self-Perception Profile for Children (SPPC). The 45-item SPAA measures global self-worth and competence in eight different areas which are evaluated through subscales. The eight subscales of the SPAA include five subscales from the SPPC and three additional subscales. The five subscales in the SPAA that are the same as those in the SPPC include scales that measure Scholastic Competence, Social Acceptance, Athletic Competence, Physical Appearance, and Behavioral Conduct. The three additional scales in the SPPA measure Romantic Appeal, Close Friendship, and Job Competence.

The SPPA is in the form of a structured alternative format where respondents have a choice of statements in two columns, and have to pick the statement that most closely describes them. After they choose one of the statements, they then have two response choices with regard to the statement including really true for me and sort of true for me. For the purposes of this dissertation, the subscales measuring Close Friendship and Social Acceptance were used. The Close Friendship subscale measures social support from a close friend and the Social Acceptance subscale measures social competence. The Close Friendship subscale includes six statements that adolescents have to choose between including "Some kids don't have a close friend who really listens to what they say" versus "Other kids do have a close

friend who really listens to what they say." The Social Acceptance subscale includes four statements that adolescents need to choose between. One of these includes "Some teenagers are popular with others their age" versus "Other teenagers are not very popular." There are three questions from the Close Friendship subscale and three from the Social Acceptance subscale that were negatively worded, and recoded. Two composite scores were formed, one from the Close Friendship subscale, and the other from the Social Acceptance subscale. These composite scores were formed by adding up the total of all of the respondent's scores in these two subscales to come up with one score that represented social support from a close friend, and one that represented social competence.

The Close Friendship and Social Acceptance subscales have both been shown to have good reliability in a number of studies. The alpha coefficients for the Social Acceptance subscale have been found to range from .79 to .86 (Cornell, Pelton, Bassin, Landrum, Ramsay, Cooley, Lynch, & Hamrick, 1990; Harter, 1988; Rudasill & Callahan, 2008). The Close Friendship subscale also has been shown to have good internal consistency with alpha coefficients of .82 and .86 found by Harter (1988) and Rudasill and Callahan (2008). The global self-worth component of the SPAA has been shown to have good concurrent validity when compared with the Rosenberg Self-Esteem Scale (RSE) (Hagborg, 1993).

In the literature, information related to gender and the SPAA was found in an article by Wade, Davidson, and O'Dea (2003). The authors conducted a study with eighty-six adolescents with a mean age of thirteen examining the impact of two programs (a media literacy program, and a self-esteem program) on risk factors related to the development of eating disorders. On the social acceptance subscale, Wade et al.

(2003), found alpha coefficients for boys and girls to be .77. For the close friendship subscale, alpha coefficients were found to be .81 and .67 for boys and girls respectively. In addition to information on gender, information on the SPPA with regard to race was also found in the literature. Thomson and Zand (2007) examined the reliability of the SPPA with a sample of 174 African American adolescents 11-14 years old. The authors found coefficients ranging from .46 to .78. Birman (1998) also examined the reliability of the SPPA with regard to race when they conducted a study with 123 immigrant, Latino adolescents. With regard to internal consistency, alpha coefficients for the Social Acceptance subscale were .60 and .56 for Latinos and non-Latinos, respectively.

Overall, the alpha coefficients for the social support from a close friend variable were higher than those for social competence for the sample used in this dissertation. The alpha coefficient for social support from a close friend for the overall sample was .90, whereas boys and girls both yielded coefficients of .88. When examining social support from a close friend by race, it was found that the alpha coefficients were .90 for Caucasian adolescents, .88 for African American adolescents, and .90 for Hispanic adolescents. The alpha coefficient for social competence for the overall sample was.75, whereas boys and girls yielded coefficients of .76 and .74 respectively. When examining social competence by race, it was found that the alpha coefficients were .77 for Caucasian adolescents, .72 for African American adolescents, and .62 for Hispanic adolescents.

Depression

For this study, depression was assessed through the Center for Epidemiologic Studies Depression Scale for Children (CES-DC; Weissman,

Orvaschel, & Padian, 1980). The CES-DC is a 20-item measure that includes items related to depressive symptoms an individual may have experienced over the course of the past week. Some of the statements included in the CES-DC are "I felt like I couldn't pay attention to what I was doing", "I felt like crying", and "It was hard to get started doing things". The response scale for the CES-DC is a 4-point likert scale ranging from 1 = not at all to 4 = a lot. For this study, a composite score was created for the depression variable that consisted of adding up the total of the adolescent's responses to all 20 items. Some of the items in the CES-DC are reverse worded, and thus were recoded prior to the composite score being developed.

Numerous articles have shown the CES-DC to have good reliability (Faulstich, Carey, Ruggiero, Enyart, & Gresham, 1986; Ohannessian, 2009; Ohannessian, Lerner, Lerner, & von Eye, 1999), with Chronbach alphas of .91, .87-.90, and .84 being found for each of these articles respectively. In their study with 148 respondents ages 8-17, Faulstich et al. (1986) also found the CES-DC to have good concurrent validity as compared to the Children's Depression Inventory, as well as good test-retest reliability and internal consistency.

For this study, the alpha coefficient for the CES-DC for the overall sample was .91, whereas boys and girls yielded coefficients of .89 and .91 respectively. When examining the CES-DC by race, it was found that the alpha coefficients were .91 for Caucasian adolescents, .89 for African American adolescents, and .88 for Hispanic adolescents.

Maternal and Paternal Alcoholism

Maternal and paternal alcoholism were assessed through the Short Michigan Screening Test (SMAST; Crews & Sher, 1992). The SMAST is a 9-item

version of the MAST (Michigan Alcoholism Screening Test). The SMAST includes items that evaluated the problem drinking of an adolescent's mother and father. Adolescents completed the SMAST for their mother (M-SMAST) and father separately (F-SMAST). The questions for the M-SMAST and the F-SMAST are the same, but the wording is changed to reflect the drinking habits of an individual's mother or father. Some of the statements included in the M-SMAST/F-SMAST are "Has your mother/father ever attended a meeting of Alcoholics Anonymous?", "Has your mother/father ever gone to anyone for help about her/his drinking?", and "Has your mother/father been arrested for drunken driving, driving while intoxicated, or driving under the influence of alcoholic beverages?" There are two response choices for the M-SMAST/F-SMAST, yes or no. For this study, one composite score was created for the M-SMAST and a separate score was created for the F-SMAST.

Numerous articles have shown the M-SMAST and F-SMAST to have good reliability (Crews & Sher, 1992; Sher & Descutner, 1986). In a study with 1001 10th and 11th grade high school students, Ohannessian (2010) also found both the M-SMAST and the F-SMAST to have good reliability, with Chronbach alphas of .80 and .86 respectively for these measures. In addition to good reliability, both the M-SMAST and F-SMAST have been found to have good validity (Crews & Sher, 1992). Overall, Crews and Sher (1992) found that shortening the MAST to 9 items improved the reliability and validity of this measure.

For this study, the alpha coefficient for the M-SMAST for the overall sample was .85, whereas boys and girls yielded coefficients of .89 and .82 respectively. When examining the M-SMAST by race, it was found that the alpha coefficient was .87 for Caucasian adolescents, .44 for African American adolescents,

and .67 for Hispanic adolescents. For the F-SMAST, the alpha coefficient for the overall sample and girls was .85, and boys yielded a coefficient of .86. When examining the F-SMAST by race, it was found that the alpha coefficient was .84 for Caucasian adolescents, .92 for African American adolescents, and .75 for Hispanic adolescents.

Data Analysis

As indicated previously, this dissertation was conducted to evaluate the extent to which there is a relationship between anxiety and alcohol use during adolescence, and the ways in which these two variables change over time. Moreover, the dissertation examined whether alcohol use predicts anxiety over time, and conversely whether anxiety predicts alcohol use over time. Finally, whether family (parental communication with mother, parental communication with father, family satisfaction, parental limit setting) and peer (social support from a close friend, social competence) variables moderated the relationship between anxiety and alcohol use over time in adolescents also was examined. A series of hierarchical multiple regression models were conducted to examine these research questions.

Data Preparation/Exploratory Analysis

Initially, the means and standard deviations of each variable were generated. A priori power was also assessed before the data were analyzed. Following the recommendation of Green (1991), the a priori analysis was evaluated for both: (a) the overall significance of the MRA model, and (b) the unique contribution of individual predictors. In addition, a thorough analysis was also made for compliance with regression assumptions before the data were analyzed. These assumptions

included examining the data for multicollinearity, external variables, missing variables, outliers, normality, linearity and homoscedasticity, influential cases, autocorrelation, and independence of errors (Allison, 1999; Field, 2005; Tabachnick & Fidell, 2007). Any necessary transformations or adjustments occurred when any of these assumptions were not met.

The Relationship Between Anxiety and Alcohol Use

1-To what extent does anxiety change over time during adolescence?

2-To what extent does alcohol use change over time during adolescence?

3-Is anxiety related to alcohol use over time during adolescence?

4-Does anxiety predict alcohol use during adolescence?

5-Does alcohol use predict anxiety during adolescence?

Analyses for questions 1 through 5. Pearson-product moment correlations were calculated to examine bivariate relations between anxiety and alcohol use. Regression models were conducted to examine the change in anxiety and alcohol use over time, and whether anxiety predicted later alcohol use and/or alcohol use predicted later anxiety. Parental alcoholism and depression were included as covariates in the models because both have been shown to be related to alcohol use (Marmorstein, 2009; Orenstein & Ullman, 1996; Ross & Hill, 2001) and anxiety (Essau et al., 2000; Havey & Dodd, 1992) in adolescents. Controlling for these factors decreased the possibility of confounded results and likely explained a greater proportion of the variance in the dependent variables.

In addition, two other covariates, alcohol use Time 1 and anxiety Time 1, were included for questions 4 and 5 respectively. These control variables were included as these questions examined the predictive relationships from Time 1 to Time 2. However, data exists for the dependent variables alcohol use and anxiety for both Times 1 and 2, thus it is possible that these variables in Time 1 may also be related to the independent variables. Research has indicated that anxiety as well as alcohol use at one time point predict future anxiety and alcohol use in adolescents (Blozis et al., 2007; Ferdinand et al., 2007; Gullone et al., 2001; Steinhausen et al., 2007). Therefore, controlling for the Time 1 measures of these dependent variables decreased the probability of confounded results.

At Step 1 of each model, the covariates, depression and parental alcoholism, were entered simultaneously into the analysis, with the additional covariates, alcohol use Time 1 and anxiety Time 1, being entered for questions 4 and 5 respectively. Step 2 consisted of direct-entry of the variables of interest, which included anxiety Time 1 for questions 1,2, and 4, and alcohol use Time 1 for questions 3 and 5. Separate models were also conducted which examined the impact of gender and race.

Family/Peer Factors: Anxiety and Alcohol Use

6-Does parental communication with mother moderate the association between anxiety and alcohol use over time during adolescence?

7-Does parental communication with father moderate the association between anxiety and alcohol use over time during adolescence?

8- Does family satisfaction moderate the association between anxiety and alcohol use over time during adolescence?

9- Does parental limit setting moderate the association between anxiety and alcohol use over time during adolescence?

10- Does social support from a close friend moderate the association between anxiety and alcohol use over time during adolescence?

11-Does social competence moderate the association between anxiety and alcohol use over time during adolescence?

Analyses for Questions 6 through 11. For questions 6 through 11 regression models were again conducted, with parental alcoholism and depression included as covariates. The differentiating factor in these models was the inclusion of moderating variables. The moderating variables were parental communication with mother, parental communication with father, family satisfaction, parental limit setting, social support from a close friend, and social competence for questions 6 through 11 respectively.

At Step 1 of each model, the covariates, depression and parental alcoholism, were entered simultaneously into the analysis. Step 2 consisted of direct-entry of the variables of interest, which included anxiety Time 1 for all of the models, as well as parental communication with mother, parental communication with father, family satisfaction, parental limit setting, social support from a close friend, and social competence for questions 6 through 11 respectively. Step 3 involved the inclusion of the interaction terms (anxiety x parental communication with mother, anxiety x parental communication with father, anxiety x family satisfaction, anxiety x parental limit setting, anxiety x social support from a close friend, and anxiety x social competence) for questions 6 through 11 respectively.

As it is common for multicollinearity to occur between interaction terms, the data were centered as necessary (Aiken & West, 1991; Jaccard & Turrisi, 2003;

Tabachnick & Fidell, 2007). Post hoc tests were conducted for significant interactions by restructuring the regression equations in order to identify the nature of the interactive relationship. This was done by including the regression of the dependent variables on the independent variables at different levels of the moderating variables in the regression equation. Three levels of the moderating variables were established equal to the mean of the moderating variable, as well as one standard deviation above and below this value (Aiken & West, 1991; Jaccard & Turrisi, 2003). As with questions 1 through 5, separate models for questions 6 through 11 were also conducted which examined the impact of gender and race.

Chapter 4

RESULTS

As indicated in Chapter 3, the purpose of this dissertation was to examine the ways in which anxiety and alcohol use change over time as well as the relationship between these constructs. In addition, another purpose of this dissertation was to examine whether anxiety predicts alcohol use over time, and/or whether alcohol use predicts anxiety over time. Finally, this dissertation examined whether family and peer characteristics moderate the relationship between anxiety and alcohol use over time.

Tests for normality and multicollinearity were conducted prior to data analysis which revealed that alcohol use, maternal alcoholism, and paternal alcoholism were not distributed normally. As a result of this, these variables were transformed using a log transformation. There was no multicollinearity found among the interaction terms for questions 6 through 11. Thus, data for these questions was left uncentered.

Stability of Anxiety and Alcohol Use Over Time

Question 1. To what extent does anxiety change over time during adolescence?

To examine this question, anxiety at Time 2 was regressed on anxiety at Time 1 using the two-stage model recommended by Keith (2006). At step one, depression and parental alcoholism were entered simultaneously as covariates into the

model. Step 2 was comprised of entry of the variable of interest: anxiety at Time 1. Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Overall sample, both genders, and all three races. The background variables of depression and paternal alcoholism resulted in a statistically significant increase in the explained variance for the overall sample $F (3, 353) = 39.29$, $p < .001$, boys $F (3, 146) = 17.41$, $p < .001$, girls $F (3, 203) = 18.61$, $p < .001$, Caucasians $F (3, 257) = 24.89$, $p < .001$, African Americans $F (3, 85) = 11.93$, $p < .001$, and Hispanics $F (3, 30) = 7.18$, $p < .01$. Both depression and maternal alcoholism made statistically significant, unique contributions to the prediction of anxiety at Time 2 for the overall sample, boys, and Caucasians, whereas depression alone made a statistically significant, unique contribution for girls, African Americans, and Hispanics. Distributional statistics (means, standard deviations) are presented in Tables 1.1 through 1.6 for predictors and criterion, and results from the Multiple Regression Analyses (MRA) are summarized in Tables 1.7 through 1.12.

Of greater interest are results from the second block of the hierarchical MRA. At this step, the variable anxiety at Time 1 was entered. Anxiety at Time 1 explained a statistically significant increase in anxiety at Time 2 for the overall sample $\Delta R^2 = .27$, $F (1, 352) = 199.80$, $p < .001$, boys $\Delta R^2 = .27$, $F (1, 145) = 81.49$, $p < .001$, girls $\Delta R^2 = .26$, $F (1, 202) = 97.90$, $p < .001$, Caucasians $\Delta R^2 = .35$, $F (1, 256) = 209.88$, $p < .001$, African Americans $\Delta R^2 = .05$, $F (1, 57) = 5.48$, $p < .05$, and Hispanics $\Delta R^2 = .15$, $F (1, 29) = 10.25$, $p < .01$. The findings reveal that anxiety at Time 1 made a contribution to the prediction of anxiety at Time 2 above and beyond that offered by depression and paternal alcoholism for the overall sample, both

genders, and adolescents of all three races. Effect size was estimated for the predictor using Cohen's (1988) f^2, where values of .02 equal a small effect, values of .15 a medium effect, and values of .35 a large effect. The effect size measures the strength of an observed effect, and the larger the effect size, the more of the variance in the dependent variable is accounted for by the model (Field, 2005). Results revealed that the significant predictor had a large effect size for the overall sample, both genders, and Caucasians, a small to medium effect size for African Americans, and a medium effect size for Hispanics. More of the variance in anxiety at Time 2 was accounted for by the overall sample, both genders, and Caucasians, than by African Americans and Hispanics.

Table 1.1 Distributional Statistics for Anxiety at Time 2 and Predictors for Overall Sample (*N* = 357)

Variable	*M*	*SD*
Anxiety at Time 2 Criterion	14.54	12.24
Depression	35.15	11.05
Maternal Alcoholism	-2.10	.77
Paternal Alcoholism	-1.52	1.42
Anxiety at Time 1	17.21	13.18

Note. *M* = Mean, *SD* = Standard Deviation

Table 1.2 Distributional Statistics for Anxiety at Time 2 and Predictors for Boys (*n* = 150)

Variable	*M*	*SD*
Anxiety at Time 2 Criterion	10.75	11.76
Depression	32.39	9.60
Maternal Alcoholism	-2.17	.61
Paternal Alcoholism	-1.69	.61
Anxiety at Time 1	13.00	12.19

Note. *M* = Mean, *SD* = Standard Deviation

Table 1.3 Distributional Statistics for Anxiety at Time 2 and Predictors for Girls (*n* = 207)

Variable	*M*	*SD*
Anxiety at Time 2 Criterion	17.28	11.89
Depression	37.16	11.62
Maternal Alcoholism	-2.05	.86
Paternal Alcoholism	-1.40	1.49
Anxiety at Time 1	20.27	13.05

Note. *M* = Mean, *SD* = Standard Deviation

Table 1.4 Distributional Statistics for Anxiety at Time 2 and Predictors for Caucasians (*n* = 261)

Variable	*M*	*SD*
Anxiety at Time 2 Criterion	14.52	12.56
Depression	34.95	11.14
Maternal Alcoholism	-2.05	.86
Paternal Alcoholism	-1.46	1.46
Anxiety at Time 1	17.23	13.58

Note. *M* = Mean, *SD* = Standard Deviation

Table 1.5 Distributional Statistics for Anxiety at Time 2 and Predictors for African Americans (*n* = 62)

Variable	*M*	*SD*
Anxiety at Time 2 Criterion	14.81	11.19
Depression	34.84	10.31
Maternal Alcoholism	-2.25	.39
Paternal Alcoholism	-1.87	1.23
Anxiety at Time 1	16.56	11.40

Note. *M* = Mean, *SD* = Standard Deviation

Table 1.6 Distributional Statistics for Anxiety at Time 2 and Predictors for Hispanics (*n* = 34)

Variable	*M*	*SD*
Anxiety at Time 2 Criterion	14.15	11.92
Depression	37.26	11.82
Maternal Alcoholism	-2.23	.41
Paternal Alcoholism	-1.41	1.44
Anxiety at Time 1	18.26	13.37

Note. *M* = Mean, *SD* = Standard Deviation

Table 1.7 Summary of Hierarchical Regression Analysis for Depression, Maternal/Parental Alcoholism, Anxiety at Time 2 for Overall Sample (N = 357)

Variable	*B*	*SE B*	B
Step 1			
Depression	.51	.05	.46**
Maternal Alcoholism	1.70	.77	.11*
Paternal Alcoholism	.13	.41	.02
Step 2			
Anxiety at Time 1	.63	.04	.67**

Note. R^2 = .25 for Step 1; ΔR^2 = .27 for Step 2 (*ps* < .001).
*p < .05. **p < .001.

Table 1.8 Summary of Hierarchical Regression Analysis for Depression, Maternal/Parental Alcoholism, Anxiety at Time 1 Predicting Anxiety at Time 2 for Boys (*n* = 150)

Variable	*B*	*SE B*	B
Step 1			
Depression	.51	.09	.42**
Maternal Alcoholism	3.99	1.41	.21*
Paternal Alcoholism	.66	.65	.07
Step 2			
Anxiety at Time 1	.64	.07	.66**

Note. R^2 = .26 for Step 1; ΔR^2 = .27 for Step 2 (*ps* < .001).
*p < .01. **p < .001.

Table 1.9 Summary of Hierarchical Regression Analysis for Depression, Maternal/Parental Alcoholism, Anxiety at Time 1 Predicting Anxiety at Time 2 for Girls (*n* = 207)

Variable	*B*	*SE B*	B
Step 1			
Depression	.47	.07	.46*
Maternal Alcoholism	.83	.90	.06
Paternal Alcoholism	-.25	.53	-.03
Step 2			
Anxiety at Time 1	.58	.06	.64*

Note. R^2 = .22 for Step 1; ΔR^2 = .26 for Step 2 (*ps* < .001).
*p < .001.

Table 1.10 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1 Predicting Anxiety at Time 2 for Caucasians (*n* = 261)

Variable	*B*	*SE B*	B
Step 1			
Depression	.47	.07	.42**
Maternal Alcoholism	1.96	.85	.13*
Paternal Alcoholism	.07	.50	.01
Step 2			
Anxiety at Time 1	.70	.05	.75**

Note. R^2 = .23 for Step 1; ΔR^2 = .35 for Step 2 (*ps* < .001).
*p < .05. **p < .001.

Table 1.11 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1 Predicting Anxiety at Time 2 for African Americans (*n* = 62)

Variable	*B*	*SE B*	B
Step 1			
Depression	.69	.12	.63**
Maternal Alcoholism	2.56	3.18	.09
Paternal Alcoholism	-.93	1.01	-.10
Step 2			
Anxiety at Time 1	.33	.14	.33*

Note. R^2 = .38 for Step 1; ΔR^2 = .05 for Step 2 (*ps* < .05).
*p < .05. **p < .001.

Table 1.12 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1 Predicting Anxiety at Time 2 for Hispanics (*n* = 34)

Variable	*B*	*SE B*	B
Step 1			
Depression	.64	.15	.64**
Maternal Alcoholism	-1.30	4.36	-.05
Paternal Alcoholism	2.26	1.16	-.27
Step 2			
Anxiety at Time 1	.59	.18	.66*

Note. R^2 = .42 for Step 1; ΔR^2 = .15 for Step 2 (*ps* < .01).
*p < .01. **p < .001.

Question 2. To what extent does alcohol use change over time during adolescence?

To examine this question, alcohol use at Time 2 was regressed on alcohol use at Time 1 using the two-stage model. At step one, depression and parental alcoholism were entered simultaneously as covariates into the model. Step 2 consisted of entering the variable of interest: alcohol use at Time 1. Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Overall sample, boys, and Caucasians. The background variables of depression and parental alcoholism resulted in a statistically significant increase in the explained variance for the overall sample F (3, 380) = 3.49, p < .05, boys F (3, 156) = 7.07, p < .001, and Caucasians F (3, 268) = 2.68, p < .05. Both depression and

maternal alcoholism made statistically significant, unique contributions to the prediction of alcohol use at Time 2 for boys. Distributional statistics (means, standard deviations) are presented in Tables 2.1 through 2.3 for the predictors and criterion, and results from the Multiple Regression Analyses (MRA) are summarized in Tables 2.4 through 2.6.

Of greater interest are results from the second block of the hierarchical MRA. At this step, the variable alcohol use at Time 1 was entered. Alcohol use at Time 1 explained a statistically significant increase in alcohol use at Time 2, for the overall sample $\Delta R^2 = .22$, $F (1, 379) = 113.41$, $p < .001$, boys $\Delta R^2 = .12$, $F (1, 155) = 23.97$, $p < .001$, and Caucasians $\Delta R^2 = .205$, $F (1, 267) = 71.58$, $p < .001$. The findings reveal that alcohol use at Time 1 made a contribution to the prediction of alcohol use at Time 2 above and beyond that offered by depression and parental alcoholism for the overall sample, boys, and Caucasians. Effect size was estimated for the predictor, and results revealed that the significant predictor had a medium to large effect size for the overall sample and Caucasians, and a small to medium effect size for boys. Consequently, the models for the overall sample and Caucasians accounted for more variance in the dependent variable than the overall model for boys.

Table 2.1 Distributional Statistics for Alcohol Use at Time 2 and Predictors for Overall Sample (*N* = 384)

Variable	*M*	*SD*
Alcohol Use at Time 2 Criterion	-.39	2.63
Depression	35.14	10.87
Maternal Alcoholism	-2.10	.76
Paternal Alcoholism	-1.57	1.37
Alcohol Use at Time 1	-.96	2.27

Note. *M* = Mean, *SD* = Standard Deviation

Table 2.2 Distributional Statistics for Alcohol Use at Time 2 and Predictors for Boys (*n* = 160)

Variable	*M*	*SD*
Alcohol Use at Time 2 Criterion	-.12	2.73
Depression	32.78	9.54
Maternal Alcoholism	-2.14	.69
Paternal Alcoholism	-1.74	1.24
Alcohol Use at Time 1	-1.10	2.20

Note. *M* = Mean, *SD* = Standard Deviation

Table 2.3 Distributional Statistics for Alcohol Use Time 2 and Predictors for Caucasians (*n* = 272)

Variable	*M*	*SD*
Alcohol Use at Time 2 Criterion	.07	2.78
Depression	35.10	11.22
Maternal Alcoholism	-2.07	.82
Paternal Alcoholism	-1.46	1.43
Alcohol Use at Time 1	-.69	2.43

Note. *M* = Mean, *SD* = Standard Deviation

Table 2.4 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Alcohol Use at Time 2 for Overall Sample (*N* = 384)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.01	.08
Maternal Alcoholism	.27	.18	.08
Paternal Alcoholism	.18	.10	.09
Step 2			
Alcohol Use at Time 1	.56	.05	.49*

Note. R^2 = .03 for Step 1; ΔR^2 = .22 for Step 2 (*ps* < .001).
*p < .001.

Table 2.5 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Alcohol Use at Time 2 for Boys (*n* = 160)

Variable	*B*	*SE B*	B
Step 1			
Depression	.06	.02	.22**
Maternal Alcoholism	.71	.31	.18*
Paternal Alcoholism	.32	.17	.15
Step 2			
Alcohol Use at Time 1	.45	.09	.36***

Note. R^2 = .12 for Step 1; ΔR^2 = .12 for Step 2 (*ps* < .001).
*p < .05. **p < .01. ***p < .001.

Table 2.6 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Alcohol Use at Time 2 for Caucasians (*n* = 272)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.02	.09
Maternal Alcoholism	.30	.21	.09
Paternal Alcoholism	.15	.12	.08
Step 2			
Alcohol Use at Time 1	.53	.06	.46*

Note. R^2 = .03 for Step 1; ΔR^2 = .21 for Step 2 (*ps* < .001).
*p < .001.

Girls, African Americans, and Hispanics. For girls, African Americans, and Hispanics, the background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 2.7 through 2.9.

Table 2.7 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Alcohol Use at Time 2 for Girls (*n* = 224)

Variable	*B*	*SE B*	B
Step 1			
Depression	.00	.02	.02
Maternal Alcoholism	.18	.22	.01
Paternal Alcoholism	.02	.10	.10
Step 2			
Alcohol Use at Time 1	.62	.06	.57*

Note. $R^2 = .01$ for Step 1; $\Delta R^2 = .31$ for Step 2 (*ps* < .001).
*$p < .001$.

Table 2.8 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Alcohol Use at Time 2 for African Americans (*n* = 224)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.01	.02	- .07
Maternal Alcoholism	-.30	.40	-.09
Paternal Alcoholism	.10	.19	.07
Step 2			
Alcohol Use at Time 1	.50	.11	.51*

Note. R^2 = .01 for Step 1; ΔR^2 = .24 for Step 2 (*ps* < .001).
*p < .001.

Table 2.9 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Alcohol Use at Time 2 for Hispanics (*n* = 72)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.05	.03	.24
Maternal Alcoholism	-.46	.51	-.15
Paternal Alcoholism	-.14	.26	-.09
Step 2			
Alcohol Use at Time 1	.49	.19	.40*

Note. R^2 = .08 for Step 1; ΔR^2 = .15 for Step 2 (*ps* < .05).
*p < .05.

The Relationship Between Anxiety and Alcohol Use

Question 3. Is anxiety related to alcohol use over time during adolescence?

Pearson-product moment correlations were calculated to examine bivariate relations between anxiety and alcohol use in adolescents. These correlations were calculated separately for the overall sample, and also by gender and race. Non-significant relationships between anxiety and alcohol use were found for every group except boys. For boys, a small to moderate positive relationship was found ($r = .17$, $p < .05$) between anxiety and alcohol use over time. Results from the correlation matrix are presented in Table 3.1.

Table 3.1 Intercorrelations Between Anxiety at Time 1 and Alcohol Use at Time 2

Variable	1	2
	Overall Sample (N = 441)	
1. Anxiety at Time 1	—	.05
2. Alcohol Use at Time 2	.05	—
	Boys (n = 179)	
1. Anxiety at Time 1	—	.17*
2. Alcohol Use at Time 2	.17*	—
	Girls (n = 262)	
1. Anxiety at Time 1	—	.01
2. Alcohol Use at Time 2	.01	—
	Caucasians (n =309)	
1. Anxiety at Time 1	—	.05
2. Alcohol Use at Time 2	.05	—
	African Americans (n = 86)	
1. Anxiety at Time 1	—	.03
2. Alcohol Use at Time 2	.03	—
	Hispanics (n = 46)	
1. Anxiety at Time 1	—	-.00
2. Alcohol Use at Time 2	-.00	—

Note. $*p < .05$.

Question 4: Does anxiety predict alcohol use over time during adolescence?

To examine this question, alcohol use at Time 2 was regressed on anxiety at Time 1 using the two-stage model. At step one, depression, parental alcoholism, and alcohol use at Time 1 were entered simultaneously as covariates into the model. Step 2 was comprised of the entry of the variable of interest: anxiety at Time 1. Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Overall sample, both genders, Caucasians, and African Americans. The background variables of depression, parental alcoholism, and alcohol use at Time 1 resulted in a statistically significant increase in the explained variance for the overall sample $F(4,331) = 25.30$, $p < .001$, boys $F(4,136) = 10.94$, $p < .001$, girls $F(4,190) = 21.89$, $p < .001$, Caucasians $F(4,237) = 15.41$, $p < .001$, and African Americans $F(4,55) = 12.44$, $p < .001$. Both depression and alcohol use at Time 1 made statistically significant, unique contributions to the prediction of alcohol use at Time 2 for the overall sample and boys, whereas maternal alcohol use and alcohol use at Time 1 made statistically significant, unique contributions for African Americans. Finally, alcohol use at Time 1 alone made a statistically significant, unique contribution for girls and Caucasians. Entering anxiety at Time 1 in Step 2 did not make a significant contribution to the overall model. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 4.1 through 4.5.

Table 4.1 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Overall Sample (*N* = 336)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.01	.10*
Maternal Alcoholism	.09	.17	.03
Paternal Alcoholism	.07	.10	.04
Alcohol Use at Time 1	.55	.06	.46**
Step 2			
Anxiety at Time 1	-.01	.01	-.01

Note. $R^2 = .23$ for Step 1; $\Delta R^2 = .00$ for Step 2.
*$p < .05$. **$p < .001$.

Table 4.2 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Boys (*n* = 141)

Variable	*B*	*SE B*	B
Step 1			
Depression	.08	.02	.27*
Maternal Alcoholism	.43	.33	.11
Paternal Alcoholism	.19	.16	.09
Alcohol Use at Time 1	.38	.10	.31*
Step 2			
Anxiety at Time 1	-.00	.02	-.02

Note. $R^2 = .24$ for Step 1; $\Delta R^2 = .00$ for Step 2.
*$p < .001$.

Table 4.3. Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Girls (*n* = 195)

Variable	*B*	*SE B*	B
Step 1			
Depression	.01	.01	.05
Maternal Alcoholism	-.03	.18	-.01
Paternal Alcoholism	.09	.11	.05
Alcohol Use at Time 1	.63	.07	.55*
Step 2			
Anxiety at Time 1	.01	.01	.03

Note. $R^2 = .31$ for Step 1; $\Delta R^2 = .00$ for Step 2.
*$p < .001$.

Table 4.4 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Caucasians (*n* = 242)

Variable	*B*	*SE B*	B
Step 1			
Depression	.03	.01	.12
Maternal Alcoholism	.14	.20	.04
Paternal Alcoholism	.01	.12	.00
Alcohol Use at Time 1	.50	.07	.42*
Step 2			
Anxiety at Time 1	-.01	.02	-.05

Note. $R^2 = .21$ for Step 1; $\Delta R^2 = .00$ for Step 2.
*$p < .001$.

Table 4.5 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1 Predicting Alcohol Use at Time 2 for African Americans (*n* = 60)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.01	.02	-.09
Maternal Alcoholism	-.88	.30	-.31*
Paternal Alcoholism	.37	.15	.27
Alcohol Use at Time 1	.65	.09	.71**
Step 2			
Anxiety at Time 1	.02	.02	.17

Note. R^2 = .48 for Step 1; ΔR^2 = .02 for Step 2.
*p < .01. **p < .001.

Hispanics. For Hispanics, the background variables of depression, parental alcoholism, and alcohol use at Time 1 did not result in a statistically significant increase in the explained variance. However, alcohol use at Time 1 made a statistically significant, unique contribution to alcohol use at Time 2 for Hispanics. Results from the Multiple Regression Analysis (MRA) are summarized in Table 4.6.

Table 4.6 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Hispanics (*n* = 34)

Variable	*B*	*SE B*	B
Step 1			
Depression	.05	.03	.28
Maternal Alcoholism	-.84	.86	-.18
Paternal Alcoholism	-.01	.24	-.00
Alcohol Use at Time 1	.48	.22	.37*
Step 2			
Anxiety at Time 1	.02	.04	.13

Note. $R^2 = .20$ for Step 1; $\Delta R^2 = .01$ for Step 2.
*$p < .05$.

Question 5. Does alcohol use predict anxiety over time during adolescence?

To examine this question, anxiety at Time 2 was regressed on alcohol use at Time 1 using the two-stage model. At step one, depression, parental alcoholism, and anxiety at Time 1 were entered simultaneously as covariates into the model. Step 2 was comprised of the entry of the variable of interest: alcohol use at Time 1. Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Overall sample, both genders, and all three races. The background variables of depression, parental alcoholism, and anxiety at Time 1 resulted in a statistically significant increase in the explained variance for the overall sample F (4,324) = 88.05, p < .001, boys F (4,133) = 35.93, p < .001, girls F (4,186) = 42.31, p

< .001, Caucasians F (4,237) = 80.03, p < .001, African Americans F (4,53) = 10.88, p < .001, and Hispanics F (4,24) = 7.24, p < .01.

In addition, depression and anxiety at Time 1 made statistically significant, unique contributions to the prediction of anxiety at Time 2 for African Americans, whereas anxiety at Time 1 alone made a statistically significant, unique contribution for the overall sample, boys, girls, Caucasians, and Hispanics. Entering alcohol use at Time 1 in Step 2 did not make a significant contribution to the overall model. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 5.1 through 5.6.

Table 5.1 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Anxiety at Time 2 for Overall Sample (*N* = 329)

Variable	*B*	*SE B*	B
Step 1			
Depression	.05	.06	.04
Maternal Alcoholism	.20	.65	.01
Paternal Alcoholism	-.00	.35	.00
Anxiety at Time 1	.64	.05	.69*
Step 2			
Alcohol Use at Time 1	.04	.22	.01

Note. R^2 = .52 for Step 1; ΔR^2 = .00 for Step 2.
*p < .001.

Table 5.2 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Anxiety at Time 2 for Boys (*n* = 138)

Variable	*B*	*SE B*	B
Step 1			
Depression	.07	.09	.06
Maternal Alcoholism	1.58	1.21	.08
Paternal Alcoholism	.05	.57	.01
Anxiety at Time 1	.63	.08	.65*
Step 2			
Alcohol Use at Time 1	.12	.32	.02

Note. R^2 = .52 for Step 1; ΔR^2 = .00 for Step 2.
*p < .001.

Table 5.3 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Anxiety at Time 2 for Girls (*n* = 191)

Variable	*B*	*SE B*	B
Step 1			
Depression	.03	.07	.03
Maternal Alcoholism	-.30	.77	-.02
Paternal Alcoholism	-.03	.46	-.00
Anxiety at Time 1	.61	.06	.68*
Step 2			
Alcohol Use at Time 1	-.10	.30	-.02

Note. R^2 = .48 for Step 1; ΔR^2 = .00 for Step 2.
*p < .001.

Table 5.4. Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Anxiety at Time 2 for Caucasians (*n* = 242)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.02	.06	-.02
Maternal Alcoholism	.53	.66	.04
Paternal Alcoholism	-.24	.39	-.03
Anxiety at Time 1	.71	.05	.76*
Step 2			
Alcohol Use at Time 1	.11	.23	.02

Note. R^2 = .58 for Step 1; ΔR^2 = .00 for Step 2.
*p < .001.

Table 5.5 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Anxiety at Time 2 for African Americans (*n* = 58)

Variable	*B*	*SE B*	B
Step 1			
Depression	.48	.16	.42**
Maternal Alcoholism	1.80	3.15	.06
Paternal Alcoholism	-.63	1.11	-.07
Anxiety at Time 1	.33	.14	.32*
Step 2			
Alcohol Use at Time 1	.32	.71	.05

Note. R^2 = .45 for Step 1; ΔR^2 = .20 for Step 2.
*p < .05. **p < .01.

Table 5.6 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Alcohol Use at Time 1 Predicting Anxiety at Time 2 for Hispanics (*n* = 29)

Variable	*B*	*SE B*	B
Step 1			
Depression	.21	.19	.20
Maternal Alcoholism	-11.14	5.35	-.42
Paternal Alcoholism	1.70	1.15	.21
Anxiety at Time 1	.64	.20	.77*
Step 2			
Alcohol Use at Time 1	-.96	1.06	-.13

Note. $R^2 = .55$ for Step 1; $\Delta R^2 = .02$ for Step 2.
*$p < .05$. **$p < .01$.

The Moderating Impact of Family and Peer Variables

Question 6. Does parental communication with mother moderate the association between anxiety and alcohol use over time during adolescence?

To examine this question, alcohol use at Time 2 was regressed on anxiety at Time 1. At step one, depression and parental alcoholism were entered simultaneously as covariates into the model. Step 2 was comprised of the entry of the variables of interest: anxiety at Time 1 and parental communication with mother. Step 3 involved entering the interaction term (anxiety x parental communication with mother). Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Overall sample, boys, and Caucasians. The background variables of depression and parental alcoholism resulted in a statistically significant increase in the explained variance for the overall sample $F(3,341) = 2.97$, $p < .05$, boys $F(3,141) = 6.78$, $p < .001$, and Caucasians $F(3,243) = 2.69$, $p < .05$. In addition, depression and maternal alcoholism made statistically significant, unique contributions to the prediction of alcohol use at Time 2 for boys. Entering anxiety at Time 1 and parental communication with mother in Step 2 did not make a significant contribution to the overall model for the overall sample, boys, and Caucasians. Entering the interaction term (anxiety x parental communication with mother) in Step 3 did not make a significant contribution to the overall model for the overall sample, Caucasians, and boys. However, for boys, a trend was observed ($p = .056$). Results from the Multiple Regression Analyses (MRA) are summarized in Tables 6.1 through 6.3.

Table 6.1 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Mother, Parental Communication with Mother x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Overall Sample (*N* = 345)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.01	.09
Maternal Alcoholism	.37	.19	.11
Paternal Alcoholism	.05	.10	.03
Step 2			
Anxiety at Time 1	-.01	.01	-.06
Parental Communication with Mother	-.01	.01	-.03
Step 3			
Parental Communication with Mother x Anxiety at Time 1	.00	.00	-.10

Note. $R^2 = .03$ for Step 1; $\Delta R^2 = .00$ for Step 2; $\Delta R^2 = .00$ for Step 3.

Table 6.2 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Mother, Parental Communication with Mother x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Boys (*n* = 145)

Variable	*B*	*SE B*	B
Step 1			
Depression	.07	.02	.22*
Maternal Alcoholism	.90	.34	.22*
Paternal Alcoholism	.16	.17	.08
Step 2			
Anxiety at Time 1	-.03	.02	-.13
Parental Communication with Mother	.02	.02	.08
Step 3			
Parental Communication with Mother x Anxiety at Time 1	-.00	.00	-.88

Note. $R^2 = .13$ for Step 1; $\Delta R^2 = .01$ for Step 2; $\Delta R^2 = .02$ for Step 3.
*$p < .01$.

Table 6.3 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Mother, Parental Communication with Mother x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Boys (*n* = 145)

Variable	*B*	*SE B*	B
Step 1			
Depression	.03	.02	.13
Maternal Alcoholism	.37	.22	.11
Paternal Alcoholism	-.04	.13	-.02
Step 2			
Anxiety at Time 1	-.02	.02	-.11
Parental Communication with Mother	-.01	.01	-.07
Step 3			
Parental Communication with Mother x Anxiety at Time 1	-.00	.00	-.21

Note. $R^2 = .03$ for Step 1; $\Delta R^2 = .01$ for Step 2; $\Delta R^2 = .00$ for Step 3.

Girls, African Americans, and Hispanics. For girls, African Americans, and Hispanics, the background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 6.4 through 6.6.

Table 6.4 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Mother, Parental Communication with Mother x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Girls (*n* = 200)

Variable	*B*	*SE B*	B
Step 1			
Depression	.01	.02	.06
Maternal Alcoholism	.11	.23	.03
Paternal Alcoholism	.07	.13	.04
Step 2			
Anxiety at Time 1	.00	.02	.00
Parental Communication with Mother	-.02	.01	-.11
Step 3			
Parental Communication with Mother x Anxiety at Time 1	.00	.00	.24

Note. $R^2 = .01$ for Step 1; $\Delta R^2 = .01$ for Step 2; $\Delta R^2 = .00$ for Step 3.

Table 6.5 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Mother, Parental Communication with Mother x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for African Americans (*n* = 59)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.01	.02	-.06
Maternal Alcoholism	-.27	.34	-.10
Paternal Alcoholism	.10	.17	.08
Step 2			
Anxiety at Time 1	.02	.03	.16
Parental Communication with Mother	-.01	.02	-.09
Step 3			
Parental Communication with Mother x Anxiety at Time 1	.00	.00	.37

Note. $R^2 = .01$ for Step 1; $\Delta R^2 = .02$ for Step 2; $\Delta R^2 = .01$ for Step 3.

Table 6.6 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Mother, Parental Communication with Mother x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Hispanics (*n* = 39)

Variable	*B*	*SE B*	B
Step 1			
Depression	.04	.04	.18
Maternal Alcoholism	-.82	.99	-.15
Paternal Alcoholism	.16	.24	.11
Step 2			
Anxiety at Time 1	.00	.04	.03
Parental Communication with Mother	.01	.03	.07
Step 3			
Parental Communication with Mother x Anxiety at Time 1	.01	.00	2.47

Note. R^2 = .04 for Step 1; ΔR^2 = .01 for Step 2; ΔR^2 = .11 for Step 3.

Question 7. Does parental communication with father moderate the association between anxiety and alcohol use over time during adolescence?

To examine this question, alcohol use at Time 2 was regressed on anxiety at Time 1. At step one, depression and parental alcoholism were entered simultaneously as covariates into the model. Step 2 was comprised of the entry of the variables of interest: anxiety at Time 1 and parental communication with father. Step 3 involved entering the interaction term (anxiety x parental communication with father). Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Overall sample and boys. The background variables of depression and parental alcoholism resulted in a statistically significant increase in the explained variance for the overall sample $F(3,340) = 3.04$, $p < .05$, and boys $F(3,141) = 6.53$, $p < .001$. Depression and maternal alcoholism were found to make statistically significant, unique contributions to the prediction of alcohol use at Time 2 for boys, whereas depression alone was found to make a statistically significant, unique contribution for the overall sample. Entering anxiety at Time 1 and parental communication with father in Step 2, and the interaction term (anxiety x parental communication with father) in Step 3 did not make significant contributions to the overall model. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 7.1 through 7.2.

Table 7.1 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Father, Parental Communication with Father x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Overall Sample (*N* = 344)

Variable	*B*	*SE B*	B
Step 1			
Depression	.03	.01	.11*
Maternal Alcoholism	.27	.19	.08
Paternal Alcoholism	.08	.11	.04
Step 2			
Anxiety at Time 1	-.01	.01	-.07
Parental Communication with Father	.00	.01	.01
Step 3			
Parental Communication with Father x Anxiety at Time 1	-.00	.00	-.22

Note. $R^2 = .03$ for Step 1; $\Delta R^2 = .00$ for Step 2; $\Delta R^2 = .00$ for Step 3.
*$p < .05$.

Table 7.2 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Father, Parental Communication with Father x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Boys (*n* = 145)

Variable	*B*	*SE B*	B
Step 1			
Depression	.07	.02	.25**
Maternal Alcoholism	.82	.36	.18*
Paternal Alcoholism	.16	.17	.08
Step 2			
Anxiety at Time 1	-.02	.02	-.09
Parental Communication with Father	.01	.01	.01
Step 3			
Parental Communication with Father x Anxiety at Time 1	-.00	.00	-.39

Note. $R^2 = .12$ for Step 1; $\Delta R^2 = .01$ for Step 2; $\Delta R^2 = .01$ for Step 3.
*$p < .05$. **$p < .01$.

Caucasians. For Caucasians, the background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance, but a trend was observed (p = .065). However, depression was found to make a statistically significant, unique contribution to the prediction of alcohol use at Time 2. Results from the Multiple Regression Analysis (MRA) is summarized in Table 7.3.

Table 7.3 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Father, Parental Communication with Father x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Caucasians (*n* = 247)

Variable	*B*	*SE B*	B
Step 1			
Depression	.03	.02	.14*
Maternal Alcoholism	.23	.22	.07
Paternal Alcoholism	.05	.13	.03
Step 2			
Anxiety at Time 1	-.02	.02	-.11
Parental Communication with Father	.00	.01	-.00
Step 3			
Parental Communication with Father x Anxiety at Time 1	-.00	.00	-.18

Note. $R^2 = .03$ for Step 1; $\Delta R^2 = .01$ for Step 2; $\Delta R^2 = .00$ for Step 3.
*$p < .05$.

Girls, African Americans, and Hispanics. For girls, African Americans, and Hispanics the background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 7.4 through 7.6.

Table 7.4 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Father, Parental Communication with Father x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Girls (*n* = 199)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.02	.07
Maternal Alcoholism	.07	.22	.02
Paternal Alcoholism	.10	.13	.06
Step 2			
Anxiety at Time 1	-.01	.02	-.04
Parental Communication with Father	.01	.01	.05
Step 3			
Parental Communication with Father x Anxiety at Time 1	-.00	.00	-.19

Note. $R^2 = .01$ for Step 1; $\Delta R^2 = .00$ for Step 2; $\Delta R^2 = .00$ for Step 3.

Table 7.5 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Father, Parental Communication with Father x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for African Americans (*n* = 60)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.00	.02	.01
Maternal Alcoholism	-.16	.36	-.06
Paternal Alcoholism	-.01	.17	-.01
Step 2			
Anxiety at Time 1	.02	.02	.12
Parental Communication with Father	-.01	.01	-.09
Step 3			
Parental Communication with Father x Anxiety at Time 1	.00	.00	.46

Note. R^2 = .00 for Step 1; ΔR^2 = .02 for Step 2; ΔR^2 = .01 for Step 3.

Table 7.6 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Communication with Father, Parental Communication with Father x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Hispanics (*n* = 37)

Variable	*B*	*SE B*	B
Step 1			
Depression	.04	.04	.21
Maternal Alcoholism	-.87	.94	-.17
Paternal Alcoholism	-.04	.24	-.03
Step 2			
Anxiety at Time 1	.02	.04	.11
Parental Communication with Father	-.01	.02	-.04
Step 3			
Parental Communication with Father x Anxiety at Time 1	-.00	.00	-1.70

Note. R^2 = .05 for Step 1; ΔR^2 = .01 for Step 2; ΔR^2 = .08 for Step 3.

Question 8. Does family satisfaction moderate the association between anxiety and alcohol use over time during adolescence?

To examine this question, alcohol use at Time 2 was regressed on anxiety at Time 1. At step one, depression and parental alcoholism were entered simultaneously as covariates into the model. Step 2 was comprised of the entry of the variables of interest: anxiety at Time 1 and family satisfaction. Step 3 involved entering the interaction term (anxiety x family satisfaction). Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Boys. The background variables of depression and parental alcoholism resulted in a statistically significant increase in the explained variance for boys F (3,143) = 6.18, p < .01. In addition, both depression and maternal alcoholism were found to make statistically significant, unique contributions to the prediction of alcohol use at Time 2. Entering anxiety Time 1 and family satisfaction in Step 2, and the interaction term (anxiety x family satisfaction) in Step 3 did not make significant contributions to the overall model. Results from the Multiple Regression Analysis (MRA) is summarized in Table 8.1.

Table 8.1 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Family Satisfaction, Family Satisfaction x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Boys (*n* = 147)

Variable	*B*	*SE B*	B
Step 1			
Depression	.06	.02	.21*
Maternal Alcoholism	.90	.34	.21*
Paternal Alcoholism	.11	.17	.05
Step 2			
Anxiety at Time 1	-.02	.02	-.10
Family Satisfaction	.01	.02	.05
Step 3			
Family Satisfaction x Anxiety at Time 1	-.00	.00	-.32

Note. R^2 = .12 for Step 1; ΔR^2 = .01 for Step 2; ΔR^2 = .01 for Step 3.
*p < .01.

Overall sample and Caucasians. The background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance, but trends were observed for the overall sample p = .05, and Caucasians p = .089). Results from the Multiple Regression Analyses (MRA) are summarized in Tables 8.2 and 8.3.

Table 8.2 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Family Satisfaction, Family Satisfaction x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Overall Sample (*N* = 352)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.01	.09
Maternal Alcoholism	.34	.20	.10
Paternal Alcoholism	.03	.10	.02
Step 2			
Anxiety at Time 1	-.01	.01	-.05
Family Satisfaction	-.01	.02	-.04
Step 3			
Family Satisfaction x Anxiety at Time 1	-.00	.00	-.12

Note. R^2 = .02 for Step 1; ΔR^2 = .00 for Step 2; ΔR^2 = .00 for Step 3.

Table 8.3 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Family Satisfaction, Family Satisfaction x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Caucasians (*n* = 253)

Variable	*B*	*SE B*	B
Step 1			
Depression	.03	.02	.11
Maternal Alcoholism	.34	.22	.10
Paternal Alcoholism	-.03	.13	-.01
Step 2			
Anxiety at Time 1	-.02	.02	-.01
Family Satisfaction	-.01	.02	-.04
Step 3			
Family Satisfaction x Anxiety at Time 1	.00	.00	-.04

Note. $R^2 = .03$ for Step 1; $\Delta R^2 = .01$ for Step 2; $\Delta R^2 = .00$ for Step 3.

Girls, African Americans, and Hispanics. For girls, African Americans, and Hispanics, the background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance. However, maternal and paternal alcoholism were both found to make statistically significant, unique contributions to the prediction of alcohol use at Time 2 for girls. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 8.4 through 8.6.

Table 8.4 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety At Time 1, Family Satisfaction, Family Satisfaction x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Girls (*n* = 205)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.02	.07
Maternal Alcoholism	.04	.23	.01*
Paternal Alcoholism	.08	.13	.05*
Step 2			
Anxiety at Time 1	.00	.02	.01**
Family Satisfaction	-.02	.02	-.09
Step 3			
Family Satisfaction x Anxiety at Time 1	.00	.00	.11

Note. $R^2 = .01$ for Step 1; $\Delta R^2 = .01$ for Step 2; $\Delta R^2 = .00$ for Step 3.
*$p < .05$. **$p < .01$.

Table 8.5 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety At Time 1, Family Satisfaction, Family Satisfaction x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for African Americans (*n* = 61)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.01	.02	-.06
Maternal Alcoholism	-.25	.37	-.09
Paternal Alcoholism	.13	.17	.10
Step 2			
Anxiety at Time 1	.03	.03	.22
Family Satisfaction	-.02	.02	-.13
Step 3			
Family Satisfaction x Anxiety at Time 1	.00	.00	.24

Note. R^2 = .02 for Step 1; ΔR^2 = .03 for Step 2; ΔR^2 = .00 for Step 3.

Table 8.6 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety At Time 1, Family Satisfaction, Family Satisfaction x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Hispanics (*n* = 38)

Variable	*B*	*SE B*	B
Step 1			
Depression	.05	.03	.26
Maternal Alcoholism	-.99	.92	-.19
Paternal Alcoholism	-.05	.24	-.04
Step 2			
Anxiety at Time 1	.02	.04	.12
Family Satisfaction	.00	.04	.01
Step 3			
Family Satisfaction x Anxiety at Time 1	.01	.01	3.15

Note. R^2 = .07 for Step 1; ΔR^2 = .01 for Step 2; ΔR^2 = .07 for Step 3.

Question 9. Does parental limit setting moderate the association between anxiety and alcohol use over time during adolescence?

To examine this question, alcohol use at Time 2 was regressed on anxiety at Time 1. At step one, depression and parental alcoholism were entered simultaneously as covariates into the model. Step 2 was comprised of the entry of the variables of interest: anxiety at Time 1 and parental limit setting. Step 3 involved entering the interaction term (anxiety x parental limit setting). Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Boys. The background variables of depression and parental alcoholism resulted in a statistically significant increase in the explained variance for boys F

(3,131) = 6.81, $p < .001$. Depression and paternal alcoholism also made statistically significant, unique contributions to the prediction of alcohol use at Time 2. Distributional statistics (means, standard deviations) are presented in Table 9.1 for the predictors and criterion, and results from the Multiple Regression Analysis (MRA) are summarized in Table 9.2. Of greater interest are results from the second block of the hierarchical MRA. At this step, the variables anxiety at Time 1 and parental limit setting were entered. Anxiety at Time 1 and parental limit setting explained a statistically significant increase in alcohol use at Time 2, $\Delta R^2 = .046$, $F(2, 129) = 3.65$, $p < .05$. The finding reveals that anxiety at Time 1 and parental limit setting made a contribution to the prediction of alcohol use at Time 2 above and beyond that offered by depression and parental alcoholism.

Only one of the two variables of interest made a statistically significant, unique contribution to the prediction of alcohol use at Time 2. The variable was parental limit setting ($p < .001$). The relative contribution of this significant predictor was compared to the contribution from the significant predictor depression (see Table 4.2). Independent contributions were evaluated through the interpretation of squared partial coefficients (Meyers, Gamst, & Guarina, 2006; Tabachnick & Fidell, 2007). The relative contributions revealed that parental limit setting is 27.6% as effective as depression in predicting alcohol use at Time 2.

Effect size was estimated for the predictors, and results revealed a medium and large effect size for depression and parental limit setting respectively. Entering the interaction term (anxiety x parental limit setting) in Step 3 did not make a significant contribution to the overall model.

Table 9.1 Distributional Statistics for Alcohol Use at Time 2 and Predictors for Boys (*n* = 135)

Variable	*M*	*SD*
Alcohol Use at Time 2	.19	2.81
Depression	32.78	9.81
Maternal Alcoholism	-2.14	.69
Paternal Alcoholism	-1.65	1.33
Anxiety at Time 1	13.10	12.81
Parental Limit Setting	13.27	2.41

Note. *M* = Mean, *SD* = Standard Deviation

Table 9.2 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Limit Setting Predicting Alcohol Use at Time 2 for Boys (*n* = 135)

Variable	*B*	*SE B*	B	pr^2	f^2
Step 1					
Depression	.07	.02	.23**	.07	.09
Maternal Alcoholism	.84	.34	.21	.05	.06
Paternal Alcoholism	.27	.17	.13*	.02	.02
Step 2					
Anxiety at Time 1	-.01	.02	-.06	.00	.00
Parental Limit Setting	.25	.10	.21*	.05	.06

Note. R^2 = .14 for Step 1; ΔR^2 = .15 for Step 2 (*ps* < .05), pr^2 = squared semi-partial coefficient, f^2 = Cohen's (1988) effect size statistic for multiple regression analyses.
*p < .05, **p < .01

Overall sample. For the overall sample, the background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance, but a trend was observed (p = .079). Results from the Multiple Regression Analysis (MRA) are summarized in Table 9.3.

Table 9.3 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Limit Setting, Parental Limit Setting x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Overall Sample (*N* = 329)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.01	.09
Maternal Alcoholism	.21	.19	.06
Paternal Alcoholism	.11	.11	.06
Step 2			
Anxiety at Time 1	-.01	.01	-.05
Parental Limit Setting	.27	.06	.24*
Step 3			
Parental Limit Setting x Anxiety at Time 1	.01	.00	.34

Note. R^2 = .02 for Step 1; ΔR^2 = .06 for Step 2; ΔR^2 = .00 for Step 3.
*p < .001.

Girls, Caucasians, African Americans, and Hispanics. For girls, Caucasians, African Americans, and Hispanics, the background variables of depression and parental alcoholism did not result in a statistically significant increase

in the explained variance. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 9.4 through 9.7

Table 9.4 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Limit Setting, Parental Limit Setting x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Girls (*n* = 194)

Variable	*B*	*SE B*	B
Step 1			
Depression	.01	.02	.07
Maternal Alcoholism	-.07	.22	-.02
Paternal Alcoholism	.10	.13	.06
Step 2			
Anxiety at Time 1	-.00	.02	-.02
Parental Limit Setting	.27	.07	.26*
Step 3			
Parental Limit Setting x Anxiety at Time 1	.01	.01	.42

Note. $R^2 = .01$ for Step 1; $\Delta R^2 = .07$ for Step 2; $\Delta R^2 = .01$ for Step 3.
*$p < .001$.

Table 9.5 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Limit Setting, Parental Limit Setting x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Caucasians (*n* = 238)

Variable	*B*	*SE B*	B
Step 1			
Depression	.03	.02	.11
Maternal Alcoholism	.19	.22	.06
Paternal Alcoholism	.05	.13	.03
Step 2			
Anxiety at Time 1	-.01	.02	-.06
Parental Limit Setting	.22	.10	.14*
Step 3			
Parental Limit Setting x Anxiety at Time 1	-.01	.02	.06

Note. $R^2 = .02$ for Step 1; $\Delta R^2 = .02$ for Step 2; $\Delta R^2 = .00$ for Step 3.
*$p < .05$.

Table 9.6 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Limit Setting, Parental Limit Setting x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for African Americans (*n* = 56)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.01	.02	- .06
Maternal Alcoholism	-.28	.40	-.10
Paternal Alcoholism	.10	.18	.08
Step 2			
Anxiety at Time 1	.03	.03	.18
Parental Limit Setting	.15	.08	.29*
Step 3			
Parental Limit Setting x Anxiety at Time 1	.01	.01	.77

Note. $R^2 = .01$ for Step 1; $\Delta R^2 = .08$ for Step 2; $\Delta R^2 = .03$ for Step 3.
*$p < .05$.

Table 9.7 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Parental Limit Setting, Parental Limit Setting x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Hispanics (*n* = 35)

Variable	*B*	*SE B*	B
Step 1			
Depression	.05	.03	.28
Maternal Alcoholism	-.86	.91	-.18
Paternal Alcoholism	.18	.24	.13
Step 2			
Anxiety at Time 1	-.05	.04	-.35
Parental Limit Setting	.19	.10	.33
Step 3			
Parental Limit Setting x Anxiety at Time 1	-.01	.02	-.44

Note. R^2 = .09 for Step 1; ΔR^2 = .14 for Step 2; ΔR^2 = .00 for Step 3.

Question 10. Does social support from a close friend moderate the association between anxiety and alcohol use over time during adolescence?

To examine this question, alcohol use at Time 2 was regressed on anxiety at Time 1. At step one, depression and parental alcoholism were entered simultaneously as covariates into the model. Step 2 was comprised of the entry of the variables of interest: anxiety at Time 1 and social support from a close friend. Step 3 involved entering the interaction term (anxiety x social support from a close friend). Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Overall sample and boys. The background variables of depression and parental alcoholism resulted in a statistically significant increase in the explained variance for the overall sample F (3,342) = 3.62, p < .05, and boys F (3,138) = 6.42, p < .001. Moreover, both depression and maternal alcoholism made statistically significant, unique contributions to the prediction of alcohol use at Time 2 for boys, whereas maternal alcoholism made a statistically significant, unique contribution for the overall sample. Entering anxiety at Time 1 and social support from a close friend in Step 2, and the interaction term (anxiety x social support from a close friend) in Step 3 did not make significant contributions to the overall model. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 10.1 and 10.2.

Table 10.1 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Support from a Close Friend, Social Support from a Close Friend x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Overall Sample (*N* = 346)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.01	.10
Maternal Alcoholism	.42	.20	.12*
Paternal Alcoholism	.05	.11	.03
Step 2			
Anxiety at Time 1	-.01	.01	-.06
Social Support from a Close Friend	.01	.04	.02
Step 3			
Social Support from a Close Friend x Anxiety at Time 1	-.00	.00	-.38

Note. R^2 = .03 for Step 1; ΔR^2 = .14 for Step 2; ΔR^2 = .00 for Step 3.
*p < .05.

Table 10.2 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Support from a Close Friend, Social Support from a Close Friend x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Boys (*n* = 142)

Variable	*B*	*SE B*	B
Step 1			
Depression	.06	.02	.22*
Maternal Alcoholism	.92	.34	.22*
Paternal Alcoholism	.12	.17	.06
Step 2			
Anxiety at Time 1	-.02	.02	-.07
Social Support from a Close Friend	.08	.06	.11
Step 3			
Social Support from a Close Friend x Anxiety at Time 1	-.00	.00	-.17

Note. R^2 = .12 for Step 1; ΔR^2 = .01 for Step 2; ΔR^2 = .00 for Step 3.
*p < .01.

Caucasians. For Caucasians, the background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance, but a trend was observed (p = .054). Results from the Multiple Regression Analysis (MRA) are summarized in Table 10.3.

Table 10.3 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Support from a Close Friend, Social Support from a Close Friend x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Caucasians (*n* = 246)

Variable	*B*	*SE B*	B
Step 1			
Depression	.03	.02	.12
Maternal Alcoholism	.37	.22	.11
Paternal Alcoholism	-.02	.13	- .01
Step 2			
Anxiety at Time 1	-.02	.02	-.10
Social Support from a Close Friend	-.02	.05	-.03
Step 3			
Social Support from a Close Friend x Anxiety at Time 1	-.00	.00	-.25

Note. R^2 = .03 for Step 1; ΔR^2 = .01 for Step 2; ΔR^2 = .00 for Step 3.

Girls, African Americans, and Hispanics. For girls, African Americans, and Hispanics, the background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 10.4 through 10.6.

Table 10.4 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Support from a Close Friend, Social Support from a Close Friend x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Girls (*n* = 204)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.02	.07
Maternal Alcoholism	.14	.23	.04
Paternal Alcoholism	.10	.13	.06
Step 2			
Anxiety at Time 1	-.00	.02	-.02
Social Support from a Close Friend	.06	.06	.07
Step 3			
Social Support from a Close Friend x Anxiety at Time 1	-.00	.01	-.20

Note. R^2 = .02 for Step 1; ΔR^2 = .01 for Step 2; ΔR^2 = .00 for Step 3.

Table 10.5 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Support from a Close Friend, Social Support from a Close Friend x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for African Americans (*n* = 62)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.01	.02	-.05
Maternal Alcoholism	-.16	.50	-.04
Paternal Alcoholism	.14	.17	.11
Step 2			
Anxiety at Time 1	.01	.03	.08
Social Support from a Close Friend	.09	.06	.20
Step 3			
Social Support from a Close Friend x Anxiety at Time 1	.00	.01	.15

Note. R^2 = .01 for Step 1; ΔR^2 = .05 for Step 2; ΔR^2 = .00 for Step 3.

Table 10.6 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Support from a Close Friend, Social Support from a Close Friend x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Hispanics (*n* = 38)

Variable	*B*	*SE B*	B
Step 1			
Depression	.07	.04	.35
Maternal Alcoholism	-1.22	.92	-.24
Paternal Alcoholism	-.06	.24	-.04
Step 2			
Anxiety at Time 1	.03	.04	.20
Social Support from a Close Friend	.06	.08	.13
Step 3			
Social Support from a Close Friend x Anxiety at Time 1	.00	.01	.44

Note. R^2 = .11 for Step 1; ΔR^2 = .04 for Step 2; ΔR^2 = .00 for Step 3.

Question 11. Does social competence moderate the association between anxiety and alcohol use over time during adolescence?

To examine this question, alcohol use at Time 2 was regressed on anxiety at Time 1. At step one, depression and parental alcoholism were entered simultaneously as covariates into the model. Step 2 comprised entry of the variables of interest: anxiety at Time 1 and social competence. Step 3 involved entering the interaction term (anxiety x social competence). Separate regression models were conducted to examine this question for the overall sample. In addition, the models were conducted by gender and race.

Boys. The background variables of depression and parental alcoholism resulted in a statistically significant increase in the explained variance for boys F (3,133) = 4.44, p < .01. Depression and maternal alcoholism were also found to make statistically significant, unique contributions to the prediction of alcohol use at Time 2. Entering anxiety Time 1 and social competence in Step 2, and the interaction term (anxiety x social competence from a close friend) in Step 3 did not make significant contributions to the overall model. Results from the Multiple Regression Analysis (MRA) are summarized in Table 11.1.

Table 11.1 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Competence, Social Competence x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Boys (*n* = 137)

Variable	*B*	*SE B*	B
Step 1			
Depression	.05	.03	.18*
Maternal Alcoholism	1.04	.40	.22**
Paternal Alcoholism	.10	.18	.04
Step 2			
Anxiety at Time 1	-.03	.03	-.10
Social Competence	.10	.08	.11
Step 3			
Social Competence x Anxiety at Time 1	-.01	.01	-.52

Note. R^2 = .09 for Step 1; ΔR^2 = .02 for Step 2; ΔR^2 = .01 for Step 3.
*p < .05. **p = .01.

Overall sample, girls, Caucasians, African Americans, and Hispanics.

For the overall sample, girls, Caucasians, African Americans, and Hispanics, the background variables of depression and parental alcoholism did not result in a statistically significant increase in the explained variance. Results from the Multiple Regression Analyses (MRA) are summarized in Tables 11.2 through 11.6.

Table 11.2 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Competence, Social Competence x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Overall Sample (*N* = 333)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.01	.06
Maternal Alcoholism	.32	.21	.09
Paternal Alcoholism	.05	.11	.03
Step 2			
Anxiety at Time 1	-.02	.01	-.07
Social Competence	.11	.05	.12*
Step 3			
Social Competence x Anxiety at Time 1	.00	.00	-.01

Note. $R^2 = .02$ for Step 1; $\Delta R^2 = .02$ for Step 2; $\Delta R^2 = .00$ for Step 3.
*$p < .05$.

Table 11.3 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Competence, Social Competence x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Girls (*n* = 196)

Variable	*B*	*SE B*	B
Step 1			
Depression	.01	.02	.04
Maternal Alcoholism	.03	.24	.01
Paternal Alcoholism	.14	.13	.08
Step 2			
Anxiety at Time 1	.01	.02	.05
Social Competence	.15	.07	.17*
Step 3			
Social Competence x Anxiety at Time 1	.00	.00	-.03

Note. $R^2 = .01$ for Step 1; $\Delta R^2 = .03$ for Step 2; $\Delta R^2 = .00$ for Step 3.
*$p < .05$.

Table 11.4 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Competence, Social Competence x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Caucasians (*n* = 240)

Variable	*B*	*SE B*	B
Step 1			
Depression	.02	.02	.09
Maternal Alcoholism	.27	.24	.08
Paternal Alcoholism	-.01	.13	-.01
Step 2			
Anxiety at Time 1	-.03	.02	-.12
Social Competence	.15	.06	.16*
Step 3			
Social Competence x Anxiety at Time 1	.00	.01	.01

Note. $R^2 = .02$ for Step 1; $\Delta R^2 = .04$ for Step 2; $\Delta R^2 = .00$ for Step 3.
*$p < .05$.

Table 11.5 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Competence, Social Competence x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for African Americans (*n* = 60)

Variable	*B*	*SE B*	B
Step 1			
Depression	-.01	.02	-.06
Maternal Alcoholism	-.19	.53	-.05
Paternal Alcoholism	.12	.18	.09
Step 2			
Anxiety at Time 1	.03	.03	.21
Social Competence	-.09	.08	-.15
Step 3			
Social Competence x Anxiety at Time 1	.01	.01	.83

Note. $R^2 = .01$ for Step 1; $\Delta R^2 = .04$ for Step 2; $\Delta R^2 = .02$ for Step 3.

Table 11.6 Summary of Hierarchical Regression Analysis for Depression, Maternal/Paternal Alcoholism, Anxiety at Time 1, Social Competence, Social Competence x Anxiety at Time 1 Predicting Alcohol Use at Time 2 for Hispanics (*n* = 33)

Variable	*B*	*SE B*	B
Step 1			
Depression	.03	.04	.17
Maternal Alcoholism	-.80	.96	-.17
Paternal Alcoholism	-.04	.24	-.03
Step 2			
Anxiety at Time 1	.04	.04	.30
Social Competence	.22	.13	.34
Step 3			
Social Competence x Anxiety at Time 1	-.03	.02	-2.09

Note. R^2 = .03 for Step 1; ΔR^2 = .12 for Step 2; ΔR^2 = .08 for Step 3.

Chapter 5

DISCUSSION

The primary purpose of this dissertation was to examine the stability of anxiety and alcohol use over time, and to investigate the relationship between these two constructs. The dissertation also explored whether anxiety predicts alcohol use over time and/or whether alcohol use predicts anxiety over time. Finally, the dissertation assessed whether family and peer variables moderate the relationship between anxiety and alcohol use over time.

Overall, the results indicated that both anxiety and alcohol use were found to be stable over time. The results also signified that there was a relationship between anxiety and future alcohol use in boys only. Anxiety was not found to predict alcohol use over time, nor was alcohol use found to predict anxiety over time. Finally, no family or peer variables were shown to moderate the relationship between anxiety and alcohol use over time. This chapter will discuss the results of the questions that were examined in this dissertation in further detail. Moreover, the chapter will discuss the implications of the findings with regard to theory and practice, limitations of the study, and recommendations for future research.

Stability of Anxiety and Alcohol Use Over Time

Anxiety at Time 1 was found to predict anxiety at Time 2 for the overall sample, both genders, and all three races. Alcohol use at Time 1 predicted alcohol use at Time 2, but for the overall sample, boys, and Caucasian adolescents only.

Consequently, with the sample in this dissertation, anxiety appeared to be more stable over time for a greater number of adolescents than alcohol use.

Stability of Anxiety Over Time

As indicated previously, anxiety at Time 1 predicted anxiety at Time 2 for the overall sample, boys, girls, Caucasian, African American, and Hispanic adolescents. The findings related to the overall sample are similar to other studies that have found that anxiety at one time point predicts future anxiety (Orvaschel, Lewinsohn, & Seeley, 1995). The results for boys and girls are also comparable to those noted in other studies regarding the prediction of anxiety from one time point to another (Costello et al., 2003; Ferdinand, Dieleman, Ormel, & Verhulst, 2007). Some studies have revealed that anxiety at one time point predicts anxiety in the future for girls more than for boys (Costello et al., 2003; Ferdinand et al., 2007), whereas other studies have not established any gender differences (Gullone et al., 2001). Similar to the study conducted by Gullone et al. (2001), the findings related to gender and anxiety over time in this dissertation were significant for both girls and boys, and large effect sizes were found for both genders. Thus, the results for boys and girls did not differ that greatly from each other in this study.

The findings that anxiety at Time 1 predicted anxiety at Time 2 for Caucasian, African American, and Hispanic adolescents add to the current research on this topic as there is a paucity of research on the impact of race on the stability of anxiety over time. Racial differences have been identified with regard to anxiety (Chen et al., 2005; Compton et al., 2000; Last & Perrin, 1993), but most studies have simply compared the prevalence of anxiety between different races, without investigating the impact of race on the stability of anxiety over time.

Stability of Alcohol Use Over Time

The results from this dissertation indicated that alcohol use at Time 1 predicted alcohol use at Time 2 for the overall sample, boys, and Caucasian adolescents. These findings are similar to results denoted in various studies where alcohol use at one time point predicted future alcohol use (Orvaschel et al., 1995; Steinhausen, Eschmann, & Metzke, 2007).

The findings that alcohol use over time was found to be stable for boys and Caucasian adolescents may have occurred because alcohol use is found to be more prevalent for boys (Barnes et al., 2000; Dick et al., 2001; Grunbaum et al., 2000) and Caucasian adolescents (Blum et al., 2000; Johnston et al., 2009) than for girls, and adolescents of other races. Stability of alcohol use over time signifies that some boys and Caucasians who had higher levels of alcohol use maintained those higher levels of alcohol use a year later. Perhaps the notion that boys and Caucasian adolescents are more prone to alcohol use in general makes it more likely that alcohol use will remain stable over time for some of these adolescents.

The Stress-Buffering Hypothesis, with its emphasis on the positive and negative influence of the environment on behaviors of a person in both a negative or positive direction (Cassel, 1976; Cobb, 1976), is a mechanism with which to explore the findings related to the stability of anxiety and alcohol use over time. Although the reasons for continued anxiety and alcohol use over time were not established in this study, one can use the theory to guide the notion that perhaps the environment of the adolescent had a role in the stability of these two constructs over time.

Because continued alcohol use over time was only found with the overall sample, boys, and Caucasian adolescents, it could be that something in the environment of these adolescents acted to influence the continued presence of this

substance in a positive or negative direction over time. It is possible that boys may be influenced in a positive manner, whereby they have lower alcohol use that remains stable over time than girls due to the fact that girls have been found to be more likely to drink alcohol as a way to emotionally cope (Opland et al., 1995). As previously indicated girls are more susceptible to internalizing behaviors such as anxiety (Bittner et al., 2007; Deas et al., 2006). Couple this with the notion that anxiety may be more likely to develop as individuals get older, and it may explain how alcohol use over time may increase with girls as they could be using this substance to emotionally cope with their increasing anxiety (Beidel et al., 2007; Masi et al., 2000).

Race may also impact the stability of alcohol use over time with the role of family and peers in the environment of Caucasian adolescents potentially impacting the use of this substance in a negative direction. Studies have found that African American or Hispanic adolescents are more positively influenced by their family than Caucasians (Fuligni, Tseng, & Lam, 1999; Gil et al., 1998). In addition, peers also have been shown to influence adolescents of various races in different ways, with Caucasian adolescents being found to have more alcohol using friends than African American adolescents (Wallace & Muroff, 2000). Thus, studies indicate the potential for alcohol use over time in Caucasians to be influenced in a negative direction with higher levels of alcohol use remaining stable over time. It may be useful to utilize the Stress-Buffering Hypothesis in future studies in order to try to identify some of the reasons behind the different findings related to stability of anxiety and alcohol use.

Whereas the environment may be influential with regard to anxiety and alcohol use over time, genetics may also play a role in the stability of these constructs. Both anxiety and alcohol use have been found to be influenced by genetics (Cronk et

al., 2004; Dick, Bernard, Aliev, Viken, Pulkinnen, Kaprio, & Rose, 2009; Ollendick & Hirsfeld-Becker, 2002; Schwandt, Lindell, Chen, Higley, Suomi, Heiliq, & Barr, 2010; Suveg et al., 2005). Thus, the combination of environmental influence and genetics may provide further insight into the stability of anxiety and alcohol use over time. Lerner's component of the Ecological Risk/Protective Theory emphasizes the importance of considering the role of biology and environment in the explanation of behavior (Lerner, 2002). Thus, researchers should examine the impact of both biology and the environment on the stability of anxiety and alcohol use in order to gain a more comprehensive understanding of the reasons contributing to the ways in which these constructs change over time.

The Relationship Between Anxiety and Future Alcohol Use

The findings in this dissertation revealed a relationship between anxiety and future alcohol use in boys only. There is some evidence from various studies that anxiety is related to alcohol use over time (Comeau et al., 2001; Deacon & Valentiner, 2000). However, many studies have not taken into account the impact of gender and/or race on this relationship. One article by Costello et al. (2003) did consider the impact of gender on anxiety and substances such as alcohol, over time, but found that girls rather than boys were more prone to this relationship, which is contrary to the results found in this dissertation.

The sample in the study by Costello et al. (2003) consisted of adolescents with diagnosed anxiety and substance use disorders. The authors included many different substances in the substance use disorder category, including alcohol. In contrast, the adolescents in this study were not diagnosed with anxiety and alcohol use disorders, and only alcohol use was explored, without combining it with other

substances. It is plausible that girls who have levels of anxiety high enough to be diagnosed may be more impacted by substance use than boys due to the severity of the anxiety. Subsequently, the findings from this dissertation contribute to existing research by taking into consideration the impact of gender on anxiety not severe enough to be diagnosed, on future alcohol use.

Another possible explanation for the findings is because boys are found to have higher externalizing behaviors such as alcohol use (Barnes et al., 2000; Stewart & Power, 2003), perhaps anxiety increases the probability that they will drink. This may be because difficulties with emotional regulation are found to contribute to adolescents making poorer decisions (Steinberg, 2007; Steinberg et al., 2006). Boys who have anxiety may have more difficulty regulating their emotions, which may lead to poorer decisions such as the decision to use alcohol. Future research may want to specify the exact ways in which anxiety impacts boys, and how this may then influence future alcohol use.

As anxiety was found to be related to future alcohol use can be supported by two of the theories used to guide this dissertation, namely the Ecological Risk/Protective Theory and the Interactional Theory of Delinquency. As previously discussed one of the components of both of these theories is the concept that relationships and behaviors change over time. The Ecological Risk/Protective Theory emphasizes the idea that relationships and behaviors are dynamic and are impacted by time (Bogenschneider, 1979; Lerner, 1991, 1995), whereas the Interactional Theory of Delinquency highlights the importance of time and change specifically related to behaviors such as alcohol use (Thornberry et al., 1994). In addition, the Interactional Theory of Delinquency underscores the importance of considering the impact of

change on the lives of individuals at different times in their life course. Hence, the results of this study support this component of the theory by investigating the relationship between anxiety and alcohol use over time in the developmental stage of adolescence.

The Bidirectional Relationship Between Anxiety and Alcohol Use

In this study, anxiety at Time 1 did not predict alcohol use at Time 2, and alcohol use at Time 1 did not predict anxiety at Time 2.

Anxiety and Future Alcohol Use

The findings that anxiety at Time 1 did not predict alcohol use at Time 2 are in conflict with some studies wherein anxiety at one time point predicted later alcohol use, with anxiety typically preceding the use of alcohol (Goodwin et al., 2004; Merikangas et al., 1998; Sung, 2004). Contrary to this, the findings in this study are comparable to other studies, such as a study conducted by Haynes, Farrell, Singleton, Meltzer, Araya, Lewis, & Wiles (2005), that did not find anxiety to predict later alcohol use.

Alcohol Use and Future Anxiety

Haynes et al. (2005) also found that alcohol use did not predict future anxiety, which was similar to the findings in this dissertation. In addition, the findings from Goodwin et al., (2004), Merikangas et al. (1998), and Sung (2004) are in line with the results from this dissertation in which alcohol use at Time 1 did not predict anxiety at Time 2, as the opposite relationship was more often noted in these studies.

It is possible that this dissertation did not find a bidirectional relationship between anxiety and alcohol use because although there was variation in the scores on

these two constructs, it was minimal, and the mean level of anxiety and alcohol use for the sample in this dissertation were both low. Conceivably, adolescents with lower levels of anxiety may not be as prone to future alcohol use as those with higher levels.

In addition, with the sample used for this study, 71 % of adolescents at Time 1 and 64 % of adolescents at Time 2 reported no alcohol use at all. With only 29 % of adolescents at Time 1 (10th grade) and 36 % of adolescents at Time 2 (11th grade) reporting any alcohol use is different from findings by Johnston et al. (2009) where 58 % of adolescents reported alcohol use by 10th grade and 72 % reported alcohol use by 12th grade. Therefore, it is feasible that the presence of no alcohol use for many in the sample also interfered with the potential of finding a relationship between anxiety and future alcohol use or vice versa.

The Moderating Impact of Family and Peer Variables

Overall, there were no family or peer variables that acted to moderate the relationship between anxiety and alcohol use over time in the adolescent sample. Parental limit setting did have a significant impact on alcohol use over time for boys, but not in a moderating fashion. These results will be discussed in further detail in this section.

Family Variables

The findings that parental communication and family satisfaction did not moderate the relationship between anxiety and future alcohol use in adolescents are contradictory to other studies which have indicated protective qualities of these variables (Kuendig & Kuntsche, 2006; Silmere & Stiffman, 2006). Although parental limit setting did not moderate the relationship between anxiety and future alcohol use,

it was shown to contribute to alcohol use in boys, which is consistent with other studies (Crosnoe et al., 2002).

Parental communication. Numerous studies have confirmed that parental communication acts as a buffer with regard to alcohol use in adolescents (Kuendig & Kuntsche, 2006; Nash et al., 2005; Riesch et al., 2006). These studies have all utilized the construct of parental communication as a combination of communication with mother and father, whereas this dissertation examined communication with mother and father separately. One study by Luk, Farhat, Iannotti, and Simons-Morton (2010) did look at the buffering impact of communication with mother and communication with father separately. The authors identified the notion that with boys, communication with father was protective with regard to marijuana use and communication with mother provided protection from smoking. However, no significant results were found with girls or with alcohol use. Therefore, the results of this study that found that communication with mother and father did not buffer adolescents from alcohol use were in line with the study conducted by Luk et al. (2010). Although Luk et al. (2010) did not find communication with mother and father to buffer adolescents from alcohol use, they did find that it had a buffering effect on marijuana use. As a result of these findings, future research may want to consider the moderating impact of communication with mother and father on anxiety and substances other than alcohol use over time.

Despite the findings that communication with mother and father did not moderate the relationship between anxiety and alcohol use, it is imperative that these two constructs continue to be examined separately in future research instead of combined into overall parental communication. This is important as various studies

have indicated that adolescents may have different communication patterns with each of their parents (Ackard, Neumark-Sztainer, Story, & Perry, 2006; Bhushan & Shirali, 1992), and that mothers may be more effective at communicating with adolescents than fathers (Rosnati, Lafrate, & Scabini, 2007). Keeping these two constructs separate will ultimately help researchers better understand the ways in which an adolescent's communication with their mother and their father separately impacts their development.

Family satisfaction. Findings in this study related to family satisfaction differed from other studies which have identified this characteristic as one that can buffer adolescents from internalizing and externalizing behaviors (Silmere & Stiffman, 2006; Woolley & Grogran-Kaylor, 2006). The results are also divergent from other studies that have found different aspects of positive family functioning, such as support, warmth, and family cohesion, to protect adolescents from anxiety and alcohol use (Husler et al., 2005; Piko & Kovacs, 2010; Wolfradt et al., 2003; Zimmerman et al., 2000). Because adolescents seem to be impacted by specific components of family functioning, future research may want to explore whether certain aspects of family satisfaction, such as satisfaction with family expectations, or decision making within one's family impact the relationship between anxiety and alcohol use over time more than the overall construct of family satisfaction.

Parental limit setting. Parental limit setting was not found to moderate the relationship between anxiety and future alcohol use in this dissertation, but it was found to predict alcohol use in boys. This finding is consistent with a study conducted by Crosnoe et al. (2002) which revealed that higher levels of parental involvement

actually increased alcohol use in boys. Another study by Marshal and Chassin (2002) also found similar results in that parental support and consistent discipline were associated with an increase in alcohol use in boys. The authors attributed their findings to the possibility that boys may have perceived parental involvement as a threat to their autonomy and independence, and subsequently increased their alcohol use for this reason. Similar to findings in previous studies, the boys in the sample in this study may also have viewed their parent's limit setting as a threat which contributed to them using alcohol. If this was the case, it may explain why parental limit setting was not found to moderate the relationship between anxiety and alcohol use in a positive fashion.

As one of the sex-role stereotypes for boys emphasizes autonomy from one's family and self-reliance (Leahy, 1981; Prentice & Carranza, 2002), boys may interpret the limits parents set as interfering with their ability to break away from their family. Thus, they may use alcohol as a way to assert their autonomy, and move themselves more into peer relationships, and further away from relationships with their family members. This notion is supported by research conducted by Grusec and Goodnow (1994) who found that boys that view limit setting as a threat to their autonomy may try to relate more to their peers through deviant behaviors, such as alcohol use. Another sex-role stereotype of boys is that they should be dominant, assertive, independent, and strong (Bartle-Haring, 1997; Neff & Terry-Schmitt, 2002). As this is the case, boys may view parental limit setting as impeding their desire to live up these stereotypes, and rebelling against the limits may be a way to feel more dominant and in control, thus more in line with masculine characteristics.

Because peers favor boys with more masculine characteristics (Blakemore, 2003; Hibbard & Buhrmester, 1998; Massad, 1981), they may rebel even more against their parent's limits. In addition, they may become increasingly involved with deviant peer behavior such as alcohol use as a way to maintain the persona of dominance and assertiveness. A cyclical effect may occur wherein parents set more limits if a male adolescent is drinking alcohol, and each time limits are set the adolescent rebels by drinking more alcohol. The increase in rebellion from the adolescent then results in more limit setting, and the cycle continues. Because sex-role stereotypes encourage girls to be more responsible, passive, obedient, and dependent on their families (Bartle-Haring, 1997; Leahy, 1981; Nielsen, 2004), the need to uphold these stereotypes may explain why parental limit setting was found to predict alcohol use in boys but not girls. Based on these stereotypes, girls may be more likely to listen and cooperate with regard to limit setting in order to fulfill the more feminine characteristics that society has deemed more appropriate for girls.

Additional reasons why parental limit setting did not moderate the relationship between anxiety and alcohol use in a positive or negative fashion may be due to the aforementioned fact that both the mean scores for anxiety and alcohol use were low, there was minimal variability in the scores, and that anxiety was not found to predict later alcohol use. As there was no relationship found between anxiety and future alcohol use, this may have impacted the ability of this family variable, as well as parental communication and family satisfaction, to moderate the relationship between these two constructs.

Lerner's component of the Ecological Risk/Protective Theory, and The Interactional Theory of Delinquency can be used to interpret the findings that parental

limit setting predicted future alcohol use in boys. Lerner's theory of developmental contextualism emphasizes the notion that there is a reciprocal relationship between the different systems that an adolescent operates within, with this dissertation emphasizing family and peers (Lerner 1991, 1995). This reciprocal influence from family and peers is also discussed in the Interactional Theory of Delinquency, where relationships are found to impact various deviant behaviors, such as alcohol use with peers (Thornberry, 1997, 2002; Thornberry et al., 1994). As both Lerner and Thornberry state that the relationships in these systems are reciprocal with individuals impacting one another within and across systems (Lerner 1991, 1995; Thornberry, 1997, 2002; Thornberry et al., 1994), the theories seem to be of use in explaining how parental limit setting may impact alcohol use. As parents of adolescents may feel the need to set limits for their children in order to ensure that they do not partake in behaviors such as alcohol use, adolescents may react to the limits by rebelling as a way to preserve their independence. Consequently, parental limit setting impacts adolescents not only in their relationships with their parents, but also in their relationships with their peers.

The findings that parental limit setting predicted future alcohol use in boys can also be supported by the Stress-Buffering Hypothesis. Although it was hypothesized that the Stress-Buffering Hypothesis would guide this dissertation by finding that family and peer variables buffered the relationship between anxiety and alcohol use, these findings did not materialize. However, the Stress-Buffering Hypothesis can be applied to the findings related to parental limit setting as it was found to impact alcohol use in a negative direction. As previously discussed, Cassel (1976) and Cobb (1976) emphasized the notion that environment can influence behavior in a positive or negative direction. Accordingly, the results related to

parental limit setting seem to apply to this theory as adolescents were negatively impacted by their family environment with regard to their future alcohol use.

Whereas this section has discussed findings related to family variables, the following section will elaborate on the findings related to the moderating impact of peer variables on anxiety and alcohol use.

Peer Variables

The peer variables social support from a close friend and social competence were not found to moderate the relationship between anxiety and future alcohol use. These findings will be discussed in further detail in this section.

Social support from a close friend. The findings in this dissertation that social support from a close friend did not moderate the relationship between anxiety and future alcohol use deviate from other studies which have shown that peer support acts as a buffer against both internalizing and externalizing behaviors in adolescents. Studies have confirmed that peer support impacts internalizing behaviors such as anxiety and externalizing behaviors such as alcohol use (Prociadano & Heller, 1983; Scholte et al., 2001; Way & Chen, 2000).

Whereas this dissertation utilized the construct of social support related to one close friend, the studies previously mentioned all examined peer support with regard to numerous peer relationships. As this is the case, there is a likelihood that the results of this dissertation did not find a significant moderating impact of this peer variable because it considered social support from one close friend, not multiple friends. Although a study by Bishop and Inderbitzen (1995) found support from one

close friend to act as a protective mechanism, their findings found that it protected adolescents from self-esteem, and not from anxiety or alcohol use. Thus, it is plausible that peer support has more protective qualities with regard to anxiety and alcohol use when looking at the impact of multiple peer friendships instead of just one. Therefore, future research may want to investigate if peer support from multiple friendships acts as a moderator between anxiety and future alcohol use.

Social competence. Similar to studies discussed in the previous section, those that examined social competence also found this peer variable to act as a buffer against both internalizing and externalizing behaviors in adolescents (Griffin et al., 2006; Lillehoj et al., 2004). Both of these studies, however, utilized only one aspect of social competence, namely assertiveness, to establish these findings.

This dissertation utilized the construct of overall social competence, and not just one aspect such as assertiveness, thus it may be that parts of social competence provide adolescents with more of a buffering effect than the construct as a whole. Hence, it may be interesting to further examine whether aspects of social competence, such as assertiveness, have more of a moderating impact on the relationship between anxiety and future alcohol use in adolescents than overall social competence.

Similar to the lack of moderation found with family variables, a lack of significance with may also have been found for the moderating impact of peer variables due to the low mean scores, minimal variability of scores, and a lack of relationship between anxiety and future alcohol use that were previously mentioned.

Covariates

The covariates of depression, maternal and paternal alcoholism, as well as anxiety and alcohol use at Time 1 were all found to make statistically significant, unique contributions to the prediction of both anxiety and alcohol use at Time 2 in some of the analyses that were conducted. These findings are not surprising considering that research has indicated that depression and parental alcoholism are associated with both anxiety and alcohol use in adolescents (Essau et al., 2000; Havey & Dodd, 1992; Marmorstein, 2009; Orenstein & Ullman, 1996; Ross & Hill, 2001). Furthermore, both anxiety and alcohol use at one time point also have been found to predict future anxiety and alcohol use in adolescents (Blozis et al., 2007; Ferdinand et al., 2007; Gullone et al., 2007; Steinhausen et al., 2007).

Boys. When examining the statistically significant, unique contribution of the covariates, it became evident that the covariates of depression and maternal alcoholism predicted both future anxiety and alcohol use in analyses conducted with boys more than any other group. With regard to the covariate of depression, because sex role stereotypes socialize boys to be more assertive, strong, and independent (Bartle-Haring, 1997; Neff & Terry-Schmitt, 2002; Prentice & Carranza, 2002), it is possible that boys who are depressed may feel that they are not maintaining this perception. Thus, they may feel more anxiety, and feel more of a need to use alcohol in order to cope with their possible feelings of failure or inadequacy. Boys are also taught to be more stoic, and to hide their emotions, as opposed to girls where it is more widely accepted for them to be sensitive and emotional (MacLean et al., 2010). Because of this, if boys are depressed, they may try to maintain this masculine stereotype by avoiding treatment for their depression where they may need to discuss

their emotions, and instead self-medicate by using alcohol. In addition, because peers also have been found to favor boys who exhibit more masculine characteristics (Blakemore, 2003; Hibbard & Buhrmester, 1998; Massad, 1981), it may be that boys who are depressed may overcompensate for what they may feel is weakness by drinking with their peers in order to maintain peer approval.

The findings related to maternal alcohol use predicting future alcohol use in boys is in contrast to a study by Ohannessian et al. (2005) that found that adolescents with alcohol dependent fathers were more likely to develop alcohol dependence themselves. However, the findings are similar to those indicated by Eggebeen (2008) related to a lack of involvement from mothers that was found to impact delinquent behaviors in boys. Mothers who are alcoholics may be less involved with their children due to their addiction. Therefore, these findings may contribute to the understanding of why maternal alcoholism may be related to future alcohol use in boys. In addition, maternal alcoholism may contribute to feelings of anxiety in boys, based on the sex-role stereotype that boys should be more autonomous with regard to their family (Leahy, 1981). In a household where there is maternal alcoholism, boys may feel more anxious about becoming autonomous from the family because they may be worried about their mother. Thus, anxiety may impact boys as they struggle between fulfilling the sex-role stereotype of being autonomous from their family while being concerned about their mother due to her alcoholism.

Implications for Practice

There are various ways that the results from this study can be applied to practice with adolescents. The application of results related to the stability of anxiety

and alcohol use over time, and the impact of parental limit setting on alcohol use in adolescents will be discussed in this section.

Anxiety Over Time

As anxiety at Time 1 was found to impact anxiety at Time 2 for the overall sample, both genders, and all races of adolescents, these findings have important implications with regard to the families and professionals who work with this population. The findings indicated that the level of anxiety an adolescent had at one point in time remained relatively the same a year later when compared with others in the sample. For this reason, efforts should be made in family systems, and larger community systems, including schools, to target those adolescents with higher levels of anxiety in order to try to reduce this internalizing behavior over time. In addition, practitioners and researchers may want to study adolescents who had lower levels of anxiety over time in order to explore the reasons behind this. As the Ecological Risk/Protective Theory emphasizes the importance of the impact of the environment, and the interplay of various systems, perhaps practitioners can utilize components of this theory to guide their practice.

Although the findings related to the stability of anxiety over time have been found in other studies for adolescents as a large group (Ferdinand et al., 2007), and broken out by gender (Costello et al., 2003), this study added to previous literature by discovering that the same is true for adolescents of different races. The findings related to stability of anxiety over time for different races have implications for practice. The findings related to race emphasize the importance of exploring various ways in which interventions can be specifically targeted toward adolescents of different races.

Alcohol Use Over Time

As the findings in this study signified that alcohol use at one time point predicted future alcohol use for the overall sample, boys, and Caucasian adolescents, these results can also impact practice as they provide families and professionals with knowledge about ways to intervene. Similar to the previous discussion, findings that alcohol use is stable over time indicate that adolescents will maintain their levels of alcohol use from one time point to another. Some adolescents will have low or no levels of alcohol use that will remain relatively the same from one time point to another, and some will have higher levels. The impact of this information is that practitioners can tailor interventions to concentrate on decreasing alcohol use in boys and Caucasian adolescents who maintained higher levels of alcohol use over time, and to continue to prevent boys and Caucasians with no alcohol use from partaking in this behavior.

Because alcohol use in girls, African Americans, and Hispanics was not found to remain stable over time, the findings suggest that alcohol use could have increased or decreased for these adolescents. Practitioners and researchers need to work with adolescents who have increased or decreased their alcohol use over time to find out the reasons for these changes.

Parental Limit Setting

The findings that parental limit setting predicted later alcohol use in boys, and that these findings are supported by other studies (Crosnoe et al., 2002; Marshal & Chassin, 2002), is somewhat concerning. However, in contrast to these findings, parental monitoring, a closely related construct, has been found to buffer adolescents from externalizing behaviors such as alcohol use (Di Clemente et al., 2001; Dishion et

al., 2003; Getz & Bray, 2005). Because buffering effects have been found for parental monitoring, practitioners may want to work with adolescents and their families to ensure that parents are setting limits in a way that will help protect boys from various behaviors such as alcohol use. It may also be important for practitioners to explore with boys their feelings related to parental limit setting in order to determine if autonomy and independence are the sole reasons for this family variable leading to alcohol use. If practitioners are better informed with regard to the reasons for parental limit setting predicting alcohol use in boys, they might be better able to develop interventions that are effective with this population. Utilizing the Stress-Buffering Hypothesis to guide treatment, practitioners may be able to more effectively determine ways in which to assist families so that parental limit setting acts as a buffer rather than a risk factor.

Whereas some of the findings in this dissertation have contributed to the need for different interventions for adolescents, there are some limitations to this study that need to be examined.

Limitations

The limitations that will be explored in this section include using self-report questionnaires as the method of data collection, generalizability of the results, lower numbers of African American and Hispanic adolescents in the sample, and low mean anxiety and alcohol scores.

Self-report Surveys

All of the data that was utilized in this study was gathered via self-report surveys that the adolescents completed. Whereas self-report surveys are a convenient

method by which to collect data quickly from a large group of individuals, this type of data collection is not without its limitations. Because the information that is gathered is completely dependent on the honesty of the respondent (Mertens, 2005; Wiersma & Jurs, 2005), the data that is collected may be skewed if the individuals are dishonest with their responses intentionally or because they do not remember events or details necessary to answer the questions effectively. Despite these limitations, there have been studies that have supported the use of self-report surveys (Niccolai, Kershaw, Lewis, Cicchetti, Ethier, & Ickovics, 2005; Smith, Steen, Spaulding-Givens, & Schwendinger, 2003; Winters, Stinchfield, Henly, & Schwartz, 1990). Therefore, although there are some limitations to this type of data collection, self-report surveys have been found to be an effective method to collect data in numerous studies.

Generalizability of Results

The data in this study was collected from adolescents in three states in the Northeast, Delaware, Maryland, and Pennsylvania. Whereas there was some diversity in the sample, the majority of the adolescents were Caucasian, and the schools that data was collected from were in suburban or rural areas. The demographics of the sample may make it difficult to generalize the results to other adolescents who may be different than those identified in this study.

Aside from these limitations, the sample used in this study was more diverse than most found in the literature related to anxiety and alcohol use in adolescents. Although some studies have examined the impact of race on anxiety and alcohol use (Stewart & Power, 2003; Way & Chen, 2000), most that have included minorities have only included African American adolescents (Safren et al., 2000). Subsequently, although the sample in this study included more Caucasian adolescents

than those of other races, it was still more diverse than other studies with its inclusion of minorities other than African Americans.

Racial Diversity of Sample

As indicated previously, there were more Caucasian adolescents than African Americans and Hispanics. Thus, the sample size for different racial groups was not equal. This could have impacted the findings as perhaps the lower number of African American and Hispanic adolescents made it more difficult for significant findings to emerge from the analyses.

With a smaller sample size, it is sometimes more difficult to obtain statistically significant results because of the p values. The p values are all approximations that are accurate when utilizing a larger sample. However, when using a smaller sample, the p value detected may not reflect the true p value of that sample, which may impact the possibility of finding statistical significance. Utilizing a larger sample size may increase the probability of discovering significant results (Allison, 1999).

Another concern with a smaller sample size relates to the power necessary for a statistical test to detect effects. If a sample size is not large enough, a statistical test will not have enough power to reveal significant results. Consequently, even if differences are present, the statistical test used may not recognize them (Aiken & West, 1991). Based on these issues with smaller sample sizes, it would be beneficial to try to recreate this study with a larger number of adolescents of different races.

Low Mean Anxiety and Alcohol Use Scores

It has been discussed throughout this chapter that the mean scores of anxiety and alcohol use were low for the sample used in this study. With the sample in this study, the mean total anxiety score was 17 at Time 1 and 15 at Time 2. The mean alcohol use score for this sample was 8 at Time 1 and 13 at Time 2. With both of these constructs, although there was some variation in the scores, it was minimal.

Low mean scores and minimal variation is meaningful statistically as regression uses a linear model to examine a relationship between two variables (Allison, 1999; Field, 2005). A perfect linear relationship between two variables (x and y) would be equal to +1 for a positive relationship or -1 for a negative relationship, with all of the values falling on the regression line. If there is no linear relationship, the slope would be equal to 0 (Allison, 1999). If the data in a sample has low mean scores and there is minimal variation for the variables on both the x and y axes, in this instance anxiety and alcohol use, the scores will result in a slope closer to 0. Because a perfect linear relationship is based on +1, having a data set that results in a regression line that is horizontal and has a slope closer to 0 will make it less likely that a relationship will be found between the two variables involved.

As a result of the low means and minimal variation found with anxiety and alcohol use in this sample, it may be beneficial to have a sample with more variability in their scores on these variables in order to examine if that impacts findings related to the relationship between these two constructs.

Recommendations for Future Research

Although recommendations for future research have been identified throughout this chapter, it is important to discuss them all comprehensively. In this

section of the dissertation, the recommendations regarding future research related to the association between anxiety and alcohol use, anxiety over time, and the moderating impact of different family and peer variables will be examined in further detail. Overall recommendations regarding the sample of adolescents that researchers may want to use in future research will also be discussed.

Anxiety and Alcohol Use Over Time

Previously noted are the findings indicating that anxiety at Time 1 predicted anxiety at Time 2 for the overall sample, both genders, and all three races of adolescents. The findings relating to race were particularly interesting, as studies have not investigated the influence of race on this relationship. The specific reasons why anxiety remained stable over time were not evaluated in this study, and warrant further research, especially those relating to the stability of anxiety in adolescents of different races. Similarly, the reasons behind the stability of alcohol use over time were also not studied in this dissertation. As alcohol use over time was found to be stable for only certain populations of adolescents, researchers may also want to examine the reasons behind these results.

The Relationship Between Anxiety and Future Alcohol Use

Because the findings in this study indicated that there was an association between anxiety and alcohol use found for boys only, researchers may want to investigate potential reasons as to why this relationship was found with this population, and not other adolescents in the sample. One of the possible explanations for this that was mentioned previously is the notion that because boys have been found to have higher levels of alcohol use (Barnes et al., 2000), perhaps anxiety increases the

likelihood that they will drink. As having difficulty regulating emotions has been found to impact an adolescent's decision making skills (Steinberg et al., 2006), anxiety may impact the decision to use alcohol in boys. Because boys are already found to make the decision to use alcohol more than girls (Grunbaum, et al., 2000; Myers et al., 2003), the difficult emotions related to anxiety may exacerbate this decision in some adolescents. Studies are needed that will examine the ways in which anxiety impacts boys, and how this behavior may be related to future alcohol use.

The Moderating Impact of Family and Peer Variables

Family Variables. Different recommendations for future research were mentioned for parental communication with mother and father, and family satisfaction. As a prospective study by Luk et al. (2010) found communication with mother and father to be protective for boys with regard to substances other than alcohol, the impact of communication with mother and father on the relationship between anxiety and substances other than alcohol over time may want to be explored by researchers in the future.

With family satisfaction, numerous studies identified specific aspects of family functioning, such as support and cohesion acting to buffer adolescents from different behaviors (Husler et al., 2005; Piko & Kovacs, 2010). As this is the case, researchers may want to explore whether certain components of family satisfaction, such as satisfaction with family expectations, or decision making within one's family are more impactful with regard to the relationship between anxiety and alcohol use over time than overall family satisfaction.

Peer Variables. Although the peer variables of peer support from a close friend and social competence were not found to moderate the relationship between anxiety and future alcohol use, there were different recommendations regarding these variables that were mentioned throughout this chapter.

As peer support in this study was explored with regard to a close friend, one of the recommendations based on previous studies was that peer support with multiple friends be used as the construct in future research. Studies have indicated a buffering effect from peer support from multiple friendships with regard to both anxiety and alcohol use separately (Prociadano & Heller, 1983; Scholte et al., 2001; Way & Chen, 2000). As the Interactional Theory of Delinquency emphasizes the reciprocity inherent in different relationships, perhaps the reciprocal connections present with multiple peers helps buffer adolescents more effectively than interactions with one peer.

Although the peer variable of social competence was not found to moderate the relationship between anxiety and alcohol use, it is possible that looking at one specific aspect of social competence, such as assertiveness, may be found to moderate this relationship. Previous studies have found that assertiveness has buffered adolescents from both anxiety and alcohol use (Griffin et al., 2006; Lillehoj et al., 2004). In lieu of this information, looking at this specific component of social competence, may also be found to buffer the relationship between these constructs. Aside from specific recommendations related to the findings, there are also some overall recommendations regarding the sample that may be interesting to consider in future research.

Overall Recommendations

As the sample size for adolescents of different races, especially African Americans and Hispanics, was lower than other adolescents in this study, it may be beneficial to repeat this study utilizing a sample size that has higher numbers of adolescents in these racial categories. In addition, the sample size in this study was not large enough to conduct analyses broken out by gender combined with race, so having a sample large enough to support the analyses necessary to examine adolescents in this manner would be beneficial. Finally, because this study utilized a community sample of adolescents, one of the implications of this was that the mean anxiety and alcohol use scores were on the low side. Forthcoming studies should investigate some of the questions explored in this study with a sample that has more variation in terms of their anxiety and alcohol use scores. Overall, utilizing a sample in the future that addresses these potential shortcomings may help increase existing knowledge on the association between anxiety and alcohol use, and whether family and peer variables act to moderate this association.

Conclusion

This study found some interesting results that can help further knowledge about anxiety and alcohol use in adolescents. From this study, we know that anxiety at one time point predicts future anxiety for the overall sample of adolescents used in this dissertation, as well as boys, girls, Caucasians, African Americans, and Hispanics. We also know that alcohol use at one time point predicts future alcohol use for the overall sample, boys, and Caucasians. Finally, we know from the results of this study that for boys only, anxiety is related to future alcohol use, and parental limit setting predicts future alcohol use. The findings also revealed that were no family or peer variables

that moderated the relationship between anxiety and alcohol use over time. However, the covariates of depression, maternal and paternal alcoholism, and anxiety and alcohol use at Time 1 were found to make statistically significant, unique contributions to the prediction of anxiety and alcohol use at Time 2 for different populations. More specifically, the covariates of depression and maternal alcoholism made statistically significant, unique contributions to both anxiety and alcohol use for boys more than any other groups of adolescents.

One finding in this study that is worthy of noting is that anxiety at one time point predicted future anxiety for all races. As the stability of anxiety over time has typically been studied with overall samples of adolescents, and different genders (Costello et al., 2003; Orvaschel et al., 1995), it was interesting to find that the results also applied to adolescents of different races. Another interesting finding was that boys appeared to be at a higher risk than girls with regard to some of the results. An association between anxiety and future alcohol use was only found with boys, and boys were the only group of adolescents where parental limit setting predicted future alcohol use. Furthermore, the covariates of depression, and maternal and paternal alcoholism were found to predict future anxiety and alcohol use in boys more than any other group.

Therefore, future research should continue to consider both gender and race when examining the stability of anxiety and alcohol use over time. In addition, future research should explore some of the reasons for the gender differences that were present with the results related to parental limit setting predicting future alcohol use in boys. Because some of the results from this study indicate that some adolescents maintain higher levels of anxiety and alcohol use over time, interventions should

identify ways to be most successful when working with these individuals. The findings of this study also illuminate the notion that both families and practitioners need to consider the impact of gender and race on anxiety, alcohol use, and parental limit setting in adolescents, as this consideration may help guide more effective interventions.

Overall, it is important to continue research that examines the relationship between anxiety and alcohol use, as well as factors that may moderate this relationship in order to be more informed of the impact of these factors on adolescents. As alcohol use continues to be on the rise for adolescents (Johnston et al., 2009), it is crucial that researchers continue to identify its relationship to anxiety. Moreover, it is essential that family and peer variables that may help buffer the relationship between anxiety and future alcohol use be continually studied. By continuing to examine the impact of both family and peers on adolescent behavior, a more comprehensive picture of how adolescents are affected will emerge. This in turn will help families and practitioners accomplish their ultimate goal, to assist adolescents with living the healthiest, happiest lives that they can.

APPENDIX A

SCREEN FOR CHILD ANXIETY RELATED DISORDERS (SCARED)

Feelings

Directions:
Below is a list of sentences that describe how people feel. Read each phrase and decide if it is "Not True or Hardly Ever True" or "Somewhat True or Sometimes True" or "Very True or Often True" for you. Then for each sentence, fill in one circle that corresponds to the response that seems to describe you for the last 3 months.

	0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True
1. When I feel frightened, it is hard to breathe.	○	○	○
2. I get headaches when I am at school.	○	○	○
3. I don't like to be with people I don't know well.	○	○	○
4. I get scared if I sleep away from home.	○	○	○
5. I worry about other people liking me.	○	○	○
6. When I get frightened, I feel like passing out.	○	○	○
7. I am nervous.	○	○	○
8. I follow my mother or father wherever they go.	○	○	○
9. People tell me that I look nervous.	○	○	○
10. I feel nervous with people I don't know well.	○	○	○
11. I get stomachaches at school.	○	○	○
12. When I get frightened, I feel like I am going crazy.	○	○	○
13. I worry about sleeping alone.	○	○	○
14. I worry about being as good as other kids.	○	○	○
15. When I get frightened, I feel like things are not real.	○	○	○
16. I have nightmares about something bad happening to my parents.	○	○	○
17. I worry about going to school.	○	○	○
18. When I get frightened, my heart beats fast.	○	○	○
19. I get shaky.	○	○	○
20. I have nightmares about something bad happening to me.	○	○	○

	0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True
21. I worry about things working out for me.	○	○	○
22. When I get frightened, I sweat a lot.	○	○	○
23. I am a worrier.	○	○	○
24. I get really frightened for no reason at all.	○	○	○
25. I am afraid to be alone in the house.	○	○	○
26. It is hard for me to talk with people I don't know well.	○	○	○
27. When I get frightened, I feel like I am choking.	○	○	○
28. People tell me that I worry too much.	○	○	○
29. I don't like to be away from my family.	○	○	○
30. I am afraid of having anxiety (or panic) attacks.	○	○	○
31. I worry that something bad might happen to my parents.	○	○	○
32. I feel shy with people I don't know well.	○	○	○
33. I worry about what is going to happen in the future.	○	○	○
34. When I get frightened, I feel like throwing up.	○	○	○
35. I worry about how well I do things.	○	○	○
36. I am scared to go to school.	○	○	○
37. I worry about things that have already happened.	○	○	○
38. When I get frightened, I feel dizzy.	○	○	○
39. I feel nervous when I am with other children or adults and I have to do something while they watch me (for example: read aloud, speak, play a game, play a sport.)	○	○	○
40. I feel nervous when I am going to parties, dances, or any place where there will be people that I don't know well.	○	○	○
41. I am shy.	○	○	○

APPENDIX B

ALCOHOL USE SURVEY

Alcohol Use Survey

The questions on the following pages are about your alcohol use **during the last six months.** Please answer every question by placing a "√ "or an "X" next to the response that best characterizes your alcohol consumption. Remember all of the information that you provide will remain confidential.

1. Have you consumed any alcoholic beverages at any time during the past six months?

   _____ Yes (*Please continue with the next question*)

   _____ No (*Do not complete the rest of the Alcohol Use Survey*)

2. How often did you usually have a *beer* in the last 6 months?

   _____ Never
   _____ A few times
   _____ About once a month
   _____ 2-3 days a month
   _____ About once a week
   _____ 2-3 days a week
   _____ 4-5 days a week
   _____ Every day

3. When you had beer, on the average day, how much did you usually drink in the the last 6 months?

   _____ I drank no beer
   _____ 1 can/bottle per day
   _____ 2 cans/bottles per day
   _____ 3 cans/bottles per day
   _____ 4 cans/bottles per day
   _____ 5 cans/bottles per day
   _____ 6 cans/bottles per day
   _____ 7 cans/bottles per day
   _____ 8 cans/bottles per day
   _____ More than 8 cans/bottles per day
   (Please specify how much: _____)

4. How many times did you drink 6 or more cans/bottles of beer in the last 6 months? Please fill in the number of times here: _____

5. How often did you usually have *wine or wine coolers* in the last 6 months?

_____ Never
_____ A few times
_____ About once a month
_____ 2-3 days a month
_____ About once a week
_____ 2-3 days a week
_____ 4-5 days a week
_____ Every day

6. When you had *wine*, on the average day, how much did you usually drink in the last 6 months ? (1 wine cooler = 1 glass of wine)

_____ I drank no wine
_____ 1 glass per day
_____ 2 glasses per day
_____ 3 glasses per day
_____ 4 glasses per day
_____ 5 glasses per day
_____ 6 glasses per day
_____ 7 glasses per day
_____ 8 glasses per day
_____ More than 8 glasses per day
(Please specify how much: _____)

7. How many times did you drink 6 or more glasses of wine in the last 6 months? Please fill in the number of times here: _____

8. How often did you usually have a drink of *liquor* (whiskey, vodka, gin, mixed drinks, etc.) in the last 6 months?

_____ Never
_____ A few times
_____ About once a month
_____ 2-3 days a month
_____ About once a week
_____ 2-3 days a week
_____ 4-5 days a week
_____ Every day

9. When you drank *liquor*, on the average day, how many drinks did you usually have in the last 6 months?

_____ I drank no liquor
_____ 1 drink per day
_____ 2 drinks per day
_____ 3 drinks per day
_____ 4 drinks per day
_____ 5 drinks per day
_____ 6 drinks per day
_____ 7 drinks per day
_____ 8 drinks per day
_____ More than 8 drinks per day
(Please specify how much: _____)

10. How many times did you have 6 or more drinks of liquor in the past 6 months?
Please fill in the number of times here: _____

11. How much liquor did an average drink contain?
Please specify number of shots/ounces _____ (*Note* 1 shot = 1 ounce)

APPENDIX C

PARENT-ADOLESCENT COMMUNICATION SCALE (PACS)

Adolescent-Mother Communication

1 Strongly Disagree	2 Moderately Disagree	3 Neither Agree Nor Disagree	4 Moderately Agree	5 Strongly Agree

1.	I can discuss my beliefs with my mother without feeling restrained or embarrassed.	1	2	3	4	5
2.	Sometimes I have trouble believing everything my mother tells me.	1	2	3	4	5
3.	My mother is always a good listener.	1	2	3	4	5
4.	I am sometimes afraid to ask my mother for what I want.	1	2	3	4	5
5.	My mother has a tendency to say things to me which would be better left unsaid.	1	2	3	4	5
6.	My mother can tell how I'm feeling without asking.	1	2	3	4	5
7.	I am very satisfied with how my mother and I talk together.	1	2	3	4	5
8.	If I were in trouble, I could tell my mother.	1	2	3	4	5
9.	I openly show affection to my mother.	1	2	3	4	5
10.	When we are having a problem, I often give my mother the silent treatment.	1	2	3	4	5
11.	I am careful about what I say to my mother.	1	2	3	4	5
12.	When talking to my mother, I have a tendency to say things that would be better left unsaid.	1	2	3	4	5
13.	When I ask questions, I get honest answers from my mother.	1	2	3	4	5
14.	My mother tries to understand my point of view.	1	2	3	4	5
15.	There are topics I avoid discussing with my mother.	1	2	3	4	5
16.	I find it easy to discuss problems with my mother.	1	2	3	4	5
17.	It is very easy for me to express all my true feelings to my mother.	1	2	3	4	5
18.	My mother nags/bothers me.	1	2	3	4	5
19.	My mother insults me when she is angry with me.	1	2	3	4	5
20.	I don't think I can tell my mother how I really feel about some things.	1	2	3	4	5

Adolescent-Father Communication

1 Strongly Disagree	2 Moderately Disagree	3 Neither Agree Nor Disagree	4 Moderately Agree	5 Strongly Agree

1. I can discuss my beliefs with my father without feeling restrained or embarrassed.	1	2	3	4	5
2. Sometimes I have trouble believing everything my father tells me.	1	2	3	4	5
3. My father is always a good listener.	1	2	3	4	5
4. I am sometimes afraid to ask my father for what I want.	1	2	3	4	5
5. My father has a tendency to say things to me which would be better left unsaid.	1	2	3	4	5
6. My father can tell how I'm feeling without asking.	1	2	3	4	5
7. I am very satisfied with how my father and I talk together.	1	2	3	4	5
8. If I were in trouble, I could tell my father.	1	2	3	4	5
9. I openly show affection to my father.	1	2	3	4	5
10. When we are having a problem, I often give my father the silent treatment.	1	2	3	4	5
11. I am careful about what I say to my father.	1	2	3	4	5
12. When talking to my father, I have a tendency to say things that would be better left unsaid.	1	2	3	4	5
13. When I ask questions, I get honest answers from my father.	1	2	3	4	5
14. My father tries to understand my point of view.	1	2	3	4	5
15. There are topics I avoid discussing with my father.	1	2	3	4	5
16. I find it easy to discuss problems with my father.	1	2	3	4	5
17. It is very easy for me to express all my true feelings to my father.	1	2	3	4	5
18. My father nags/bothers me.	1	2	3	4	5
19. My father insults me when he is angry with me.	1	2	3	4	5
20. I don't think I can tell my father how I really feel about some things.	1	2	3	4	5

APPENDIX D

FAMIILY SATISFACTION SCALE (FSS)

Family Satisfaction

1	2	3	4	5
Dissatisfied	Somewhat Dissatisfied	Generally Satisfied	Very Satisfied	Extremely Satisfied

HOW SATISFIED ARE YOU WITH:

1. How close you feel to the rest of your family?	1	2	3	4	5
2. Your ability to say what you want in your family?	1	2	3	4	5
3. Your family's ability to try new things?	1	2	3	4	5
4. How often parents make decisions in your family?	1	2	3	4	5
5. How much your mother and father argue with each other?	1	2	3	4	5
6. How fair the criticism is in your family?	1	2	3	4	5
7. The amount of time you spend with your family?	1	2	3	4	5
8. The way you talk together to solve family problems?	1	2	3	4	5
9. Your freedom to be alone when you want to?	1	2	3	4	5
10. How strictly you stay with who does what chores in your family?	1	2	3	4	5
11. Your family's acceptance of your friends?	1	2	3	4	5
12. How clear it is what your family expects of you?	1	2	3	4	5
13. How often you make decisions as a family, rather than individually?	1	2	3	4	5
14. The number of fun things your family does together?	1	2	3	4	5

APPENDIX E

PARENTAL LIMIT SETTING MEASURE (PLSM)

What I Am Allowed To Do

Do your parents/guardians allow you to:
(please circle either "yes" or "no" for each question)

1.	Stay out with friends until midnight	Yes	No
2.	Make your own decisions about how to spend free time	Yes	No
3.	Have same-sex friends to your house without adults there	Yes	No
4.	Go out on dates without adults present	Yes	No
5.	Be left at home alone during the afternoon	Yes	No
6.	Be left at home alone during the evening	Yes	No
7.	Sleep over at a friend's house	Yes	No
8.	Decide on your own bedtime	Yes	No
9.	Decide on the type of clothes to wear	Yes	No
10.	Have a part time job	Yes	No
11.	Decide how to spend your money	Yes	No
12.	Ride in a car with your friends	Yes	No
13.	Date members of the opposite sex	Yes	No
14.	Go steady with a boy/girl friend	Yes	No

Do your parents:

15.	Check to see what you are doing when you are on the computer, watching t.v., or playing video games	Yes	No
16.	Call you to check up on you	Yes	No

ID: ___ ___ ___ ___ ___

APPENDIX F

SELF-PERCEPTION PROFILE FOR ADOLESCENTS (SPPA)

People In My *Life*

These next questions are about your friends. The questions are in the same format as the last questionnaire. Again, first decide whether you are more like the teenagers on the left or the teenagers on the right. Then go to that side of the page and decide whether that is only sort of true for you or really true for you. Then, put an "**X**" in that box. **Be sure to mark only one of the four boxes for each pair of sentences.**

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
1.	☐	☐	Some kids have a close friend who they can tell problems to	**BUT**	Other kids *don't* have a close friend who they can tell problems to.	☐	☐
2.	☐	☐	Some kids have a close friend who really understands them	**BUT**	Other kids *don't* have a close friend who understands them.	☐	☐
3.	☐	☐	Some kids have a close friend who they can talk to about things that bother them	**BUT**	Other kids *don't* have a close friend who they can talk to about things that bother them.	☐	☐
4.	☐	☐	Some kids *don't* have a close friend who they like to spend time with	**BUT**	Other kids *do* have a close friend who they like to spend time with.	☐	☐
5.	☐	☐	Some kids *don't* have a close friend who really listens to what they say	**BUT**	Other kids *do* have a close friend who really listens to what they say.	☐	☐
6.	☐	☐	Some kids *don't* have a close friend who cares about their feelings	**BUT**	Other kids *do* have a close friend who cares about their feelings.	☐	☐

ID: ___ ___ ___ ___ ___

What I am Like

Directions:
First, we would like you to decide whether you are more like the teenagers on the left side who would rather go to the movies, or whether you are more like the teenagers on the right side who would rather go to sporting events. Don't mark anything down yet, but first decide which kind of teenager is most like you, and go to that side of the page. Now, decide whether that is only sort of true for you or really true for you and mark your answer box with an "X". **Be sure to only check one of the four boxes for each pair of sentences!**

Sample Sentence

Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
☐	☐	Some teenagers like to go to the movies in their spare time	**BUT**	Other teenagers would rather go to sporting events.	☐	☐

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
1.	☐	☐	Some teenagers feel that they are just as smart as others their age	**BUT**	Other teenagers aren't so sure and wonder if they are as smart.	☐	☐
2.	☐	☐	Some teenagers find it hard to make friends	**BUT**	For other teenagers, it's pretty easy.	☐	☐
3.	☐	☐	Some teenagers do very well at all kinds of sports	**BUT**	Other teenagers don't feel that they are very good when it comes to sports.	☐	☐
4.	☐	☐	Some teenagers are not happy with the way they look	**BUT**	Other teenagers are happy with the way they look.	☐	☐
5.	☐	☐	Some teenagers are often disappointed with themselves	**BUT**	Other teenagers are pretty pleased with themselves.	☐	☐
6.	☐	☐	Some teenagers are pretty slow in finishing their school work	**BUT**	Other teenagers can do their school work more quickly.	☐	☐
7.	☐	☐	Some teenagers have a lot of friends	**BUT**	Other teenagers don't have very many friends.	☐	☐
8.	☐	☐	Some teenagers think they could do well at just about any new athletic activity	**BUT**	Other teenagers are afraid they might not do well at a new athletic activity.	☐	☐
9.	☐	☐	Some teenagers wish their body was different	**BUT**	Other teenagers like their body the way it is.	☐	☐

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
10.	☐	☐	Some teenagers don't like the way they are leading their life	**BUT**	Other teenagers do like the way they are leading their life.	☐	☐
11.	☐	☐	Some teenagers do very well at their classwork	**BUT**	Other teenagers don't do very well at their classwork.	☐	☐
12.	☐	☐	Some teenagers are very hard to like	**BUT**	Other teenagers are really easy to like.	☐	☐
13.	☐	☐	Some teenagers feel that they are better than others their age at sports	**BUT**	Other teenagers don't feel they can play as well.	☐	☐
14.	☐	☐	Some teenagers wish their physical appearance was different	**BUT**	Other teenagers like their physical appearance the way it is.	☐	☐
15.	☐	☐	Some teenagers are happy with themselves most of the time	**BUT**	Other teenagers are often not happy with themselves.	☐	☐
16.	☐	☐	Some teenagers have trouble figuring out the answers in school	**BUT**	Other teenagers almost always can figure out the answers.	☐	☐
17.	☐	☐	Some teenagers are popular with others their age	**BUT**	Other teenagers are not very popular.	☐	☐
18.	☐	☐	Some teenagers don't do very well at new outdoor games	**BUT**	Other teenagers are good at new games right away.	☐	☐
19.	☐	☐	Some teenagers think that they are good looking	**BUT**	Other teenagers think that they are not very good looking.	☐	☐
20.	☐	☐	Some teenagers like the kind of person they are	**BUT**	Other teenagers often wish they were someone else.	☐	☐
21.	☐	☐	Some teenagers feel that they are pretty intelligent	**BUT**	Other teenagers question whether they are intelligent.	☐	☐
22.	☐	☐	Some teenagers feel that they are socially accepted	**BUT**	Other teenagers wished that more people their age accepted them.	☐	☐
23.	☐	☐	Some teenagers do not feel that they are very athletic	**BUT**	Other teenagers feel that they are very athletic.	☐	☐
24.	☐	☐	Some teenagers really like the way they look	**BUT**	Other teenagers wish they looked different.	☐	☐
25.	☐	☐	Some teenagers are very happy being the way that they are	**BUT**	Other teenagers wish they were different.	☐	☐

APPENDIX G

CENTER FOR EPIDEMIOLOGIC STUDIES DEPRESSION SCALE FOR CHILDREN (CES-DC)

How My Week Has Been

The purpose of this questionnaire is to find out how you were feeling during the **past week.**
For each sentence, circle either:

1 = You felt or acted this way NOT AT ALL
2 = You felt or acted this way A LITTLE
3 = You felt or acted this way SOMETIMES
4 = You felt or acted this way A LOT

Please **circle** the number below that best describes how you felt or acted during the **past week.**

During the Past Week:	Not At All	A Little	Some	A Lot
1. I was bothered by things that usually don't bother me.	1	2	3	4
2. I did not feel like eating, I wasn't very hungry.	1	2	3	4
3. I wasn't able to feel happy, even when my family or friends tried to help me feel better.	1	2	3	4
4. I felt like I was just as good as other kids.	1	2	3	4
5. I felt like I couldn't pay attention to what I was doing.	1	2	3	4
6. I felt down and unhappy.	1	2	3	4
7. I felt like I was too tired to do things.	1	2	3	4
8. I felt like something good was going to happen.	1	2	3	4
9. I felt like things I did before didn't work out right.	1	2	3	4
10. I felt scared.	1	2	3	4
11. I didn't sleep as well as I usually sleep.	1	2	3	4
12. I was happy.	1	2	3	4
13. I was more quiet than usual.	1	2	3	4
14. I felt lonely, like I didn't have any friends.	1	2	3	4
15. I felt like kids I know were not friendly or that they didn't want to be with me.	1	2	3	4
16. I had a good time.	1	2	3	4
17. I felt like crying.	1	2	3	4
18. I felt sad.	1	2	3	4
19. I felt like people didn't like me.	1	2	3	4
20. It was hard to get started doing things.	1	2	3	4

APPENDIX H

SHORT MICHIGAN SCREENIING TEST (SMAST)

Please complete this form about your MOTHER'S drinking. If you do NOT live with your natural, biological mother, please fill out this form for the maternal/female guardian that you live with and write down who that person is here (e.g., step-mother, aunt, grandmother).

PLEASE CIRCLE YOUR ANSWERS.

1. Has your father, grandparent, or other near relative ever complained about your **mother's** drinking?

   Yes No

2. Has your **mother** ever attended a meeting of Alcoholics Anonymous?

   Yes No

3. Has your **mother's** drinking ever created problems between her and your father (or step-father) or another relative?

   Yes No

4. Has your **mother** ever gotten into trouble at work because of drinking?

   Yes No

5. Has your **mother** ever neglected her obligations, family, or work for two or more days in a row because she was drinking?

   Yes No

6. Has your **mother** ever gone to anyone for help about her drinking?

   Yes No

7. Has your **mother** ever been in a hospital because of drinking?

   Yes No

8. Has your **mother** ever been arrested for drunken driving, driving while intoxicated, or driving under the influence of alcoholic beverages?

Yes No

9. Has your **mother** ever been arrested, even for a few hours, because of other drunken behavior?

Yes No

10. Is your **mother** a "recovering" alcoholic (someone who has had a drinking problem in the past, but does not drink anymore)?

Yes No

11. If your **mother** is a "recovering" alcoholic, how long has she been sober (not drinking)?

1 = 6 months or less

2 = between 6 months and 1 year

3 = between 1 year and 3 years

4 = between 3 years and 5 years

5 = more than 5 years

Please complete this form about your FATHER'S drinking. If you do NOT live with your natural, biological father, please fill out this form for the paternal/male guardian that you live with and write down who that person is here (e.g., step-father, uncle, grandfather).

PLEASE CIRCLE YOUR ANSWERS.

1. Has your mother, grandparent, or other near relative ever complained about your **father's** drinking?

   Yes No

2. Has your **father** ever attended a meeting of Alcoholics Anonymous?

   Yes No

3. Has your **father's** drinking ever created problems between him and your mother (or step-mother) or another relative?

   Yes No

4. Has your **father** ever gotten into trouble at work because of drinking?

   Yes No

5. Has your **father** ever neglected his obligations, family, or work for two or more days in a row because he was drinking?

   Yes No

6. Has your **father** ever gone to anyone for help about his drinking?

   Yes No

7. Has your **father** ever been in a hospital because of drinking?

   Yes No

8. Has your **father** ever been arrested for drunken driving, driving while intoxicated, or driving under the influence of alcoholic beverages?

Yes No

9. Has your **father** ever been arrested, even for a few hours, because of other drunken behavior?

Yes No

10. Is your **father** a "recovering" alcoholic (someone who has had a drinking problem in the past, but does not drink anymore)?

Yes No

11. If your **father** is a "recovering" alcoholic, how long has he been sober (not drinking)?

1 = 6 months or less

2 = between 6 months and 1 year

3 = between 1 year and 3 years

4 = between 3 years and 5 years

5 = more than 5 years

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