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An Examination of the Five Factors of Personality, Pubertal Onset and Alcohol Usage in Adolescent Males

Sarah Wickman
Western Kentucky University

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AN EXAMINATION OF THE FIVE FACTORS OF PERSONALITY, PUBERTAL ONSET, AND ALCOHOL USAGE IN ADOLESCENT MALES

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Sarah Elsa Wickman

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AN EXAMINATION OF THE FIVE FACTORS OF PERSONALITY, PUBERTAL ONSET, AND ALCOHOL USAGE IN ADOLESCENT MALES

Date Recommended 12/10/05

Director of Thesis
Melissa Halman, PhD

Date

Director of Graduate Studies 12/15/05

Date
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Recent national surveys have demonstrated an increase in alcohol use among adolescents over the past five years (Johnston, O'Malley, & Bachman, 2003; Kann et al., 2000). It is important to understand factors that influence alcohol use in order to aid in the creation of preventative measures due to the many possible negative consequences associated with drinking alcohol (i.e., unwanted sexual activity, delinquency, abuse of other drugs, violence, car accidents, and poor academic performance) (Boyd, Howard, & Zucker, 1995). Two factors that have been studied as possible predictors of adult and adolescent alcohol use are personality and pubertal onset. Specifically, studies have linked the personality factors of Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism and reports of alcohol use in adults and older adolescents (Austin et al., 2003; Gullone & Moore, 2000; Kubicka, Matejcek, Dytrych, & Roth, 2001; Markey, Markey, & Tinsley, 2003; Musgrave-Marquart & Bromley, 1997). Furthermore, studies have also found that the age at which one reaches puberty has been linked to participation in risky behaviors, specifically alcohol use (Felson & Haynie, 2002; Ge, Conger, & Elder, 2001; Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997; Sonis, Comit, & Blue, 1985; Stice, Presnell, & Bearman, 2001).
The current study examined the personality factors of Extraversion, Openness to Experience, and Conscientiousness, pubertal onset, and alcohol usage (underaged drinking and intoxication). One hundred boys in the sixth, seventh, and eighth grades and their parents were randomly selected to serve as participants in the study. The boys completed the Self-Rating Scale for Pubertal Development (Carskadon & Acebo, 1993), Adolescent Risk Behavior Questionnaire (Gullone & Moore, 2000), and a revised version of the NEO–Five Factor Inventory (Costa & McCrae, 1992).

It was hypothesized the three personality factors of Conscientiousness, Extraversion, and Openness to Experience would significantly predict the level of alcohol usage in boys. Specifically, lower scores on the Conscientiousness Scale, higher scores on the Extraversion, and higher scores on the Openness scales would be predictors of underaged drinking and intoxication in boys. Second, it was hypothesized that the level of pubertal development would significantly predict of alcohol involvement. More specifically, higher scores on the Pubertal Development Scale would significantly predict underaged drinking and intoxication in boys. Finally, it was expected that scores obtained from the Conscientiousness, Extraversion, and Openness scales would interact with scores obtained on the Pubertal Development Scale and significantly predict underaged drinking and intoxication. Standard regressions were conducted to examine the hypotheses.

Results of the regression analysis indicated that the overall model (pubertal development) significantly predicted underaged drinking and intoxication, but accounted for only 10% variance in underaged drinking and 13% in intoxication.
Introduction

Adolescents are beginning to use mind altering substances, specifically alcohol, at younger ages and at higher rates than in the past. Two recent national studies demonstrated that alcohol use in the adolescent population has increased from 32% to 46% over past five years (Johnston, O'Malley, & Bachman, 2003; Kann et al., 2000). These studies also found that adolescents are using alcohol at higher rates than other substances including tobacco and other illegal substances. Alcohol use has been associated with many negative consequences such as unwanted sexual activity, delinquency, abuse of other drugs, violence, car accidents, and poor academic performance (Boyd, Howard, & Zucker, 1995). It is these negative consequences that make understanding predictors of alcohol use crucial to recognizing warning signs which aid in creating prevention programs.

Two factors that have been examined as possible predictors of alcohol use are personality factors and the onset of puberty. Specifically, studies have found a relationship between the personality factors of Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism and reports of alcohol use in adults and older adolescents (Austin et al., 2003; Gullone & Moore, 2000; Kubicka, Matejecak, Dytrych, & Roth, 2001; Markey, Markey, & Tinsley, 2003; Musgrave-Marquart & Bromley, 1997). Studies have also found that the age at which one reaches puberty is highly influential on the level of psychological distress and increased social pressures, which can lead to participation in risky behaviors, specifically alcohol use (Felson & Haynie, 2002; Ge, Conger, & Elder, 2001; Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997; Sonis, Comit, & Blue, 1985; Stice, Presnell, & Bearman, 2001).
Very few studies have examined these two factors, personality and pubertal onset, combined in young adolescents. One study to date has examined the onset of puberty and personality factors on adolescent risk-taking behaviors, including alcohol use. Markey, Markey, and Tinsley (2003) examined these factors in 60 preadolescent and adolescent girls and found a significant interaction between the personality factor of Openness to Experience, pubertal onset, and increased participation in risky behaviors, including alcohol use. However, minimal research to date has examined the combined effect of these two factors as predictors of participation in risky behaviors, specifically alcohol use among preadolescent and adolescent boys.

The following literature review will begin by providing an overview of the prevalence of alcohol use in adolescents. The review will address the many known side effects and consequences typically associated with adolescent and adulthood alcohol use. Personality will then be discussed in detail and will include an introduction to personality theories, assessment methods of personality factors, and an examination of research that has focused specifically on personality and alcohol use in adults and adolescents. The primary personality model that will be discussed and used for the current research is the Five Factor Model of Personality. The next section will provide an overview of preadolescent and adolescent pubertal development and how onset (early vs. late) influences participation in risky behaviors. The remainder of the paper will focus on the current investigation of the influence of personality factors and level of pubertal development on alcohol use in preadolescent and adolescent males.
Review of Literature

There is a delicate line between healthy and unhealthy adolescent development. Self-discovery, freedom of choice, risky behavior, self-exploration, and the emotional journey that challenges each of these areas are crucial in developing the foundation of self-awareness and ethics in a productive and well-grounded adult. On the other side of this line are the adolescents who do not find the stopping point of these behaviors. They continue with conduct that becomes detrimental to further development of their emotions, judgment, and physical well-being. What determines a person's decisions to participate in behaviors that are self-destructive rather than behaviors that promote positive growth and development in the quest for independence?

Factors such as pubertal onset and personality have been shown to influence the onset and duration of risky behaviors. Gullone and Moore (2000) define risk-taking as participation in behaviors that involve potential negative consequences balanced by perceived positive consequences, meaning that the perceived gain of an activity is balanced by the loss. They grouped various types of risky behaviors together depending on whether or not they are socially acceptable and depending on whether or not the outcome is positive or negative. Based on these criteria, Gullone and Moore yielded four categories of risky behavior: thrill-seeking behaviors, antisocial behaviors, reckless behaviors, and rebellious behaviors. The category of thrill-seeking includes behaviors that are challenging but relatively socially acceptable for adolescents and adults and can result in either positive or negative consequences. Some examples of thrill-seeking behaviors include engaging in dangerous sports, experimenting with sexuality, and participating in other activities that would result in a "rush." Antisocial behaviors are
behaviors that are viewed as socially inappropriate for adults and adolescents and typically result in negative outcomes. Some examples of antisocial behavior include cheating, over-eating, and discriminating against others. Reckless behaviors can be described as activities that have increased chances of negative consequences and are not viewed as socially acceptable at any age. Examples of reckless behaviors include drinking and driving, having unprotected sex, speeding, and using illegal drugs. Rebellious behaviors in contrast to thrill-seeking, reckless, and antisocial behaviors are often described as rites of passage in establishing independence and therefore more socially understood. Typically, rebellious behaviors are activities that adults commonly engage in but are not as acceptable or legal for adolescents. However, these behaviors can and are often the source of negative consequences, especially for adolescents. Examples of rebellious behaviors include smoking cigarettes, having sexual relationships, and drinking alcohol. It is this category of behaviors, specifically alcohol use, which will be the focus of the current study.

Understanding alcohol use in adolescents is important because as studies demonstrate, alcohol use in this population has increased with more individuals using alcohol at younger ages. The Youth Risk Behavior Surveillance (Kann et al., 2000) demonstrated that 32.3% of adolescents had experienced using alcohol before the age of 13, which is approximately an 8th grade educational level. Johnston, O'Malley, and Bachman's Monitoring the Future survey (2003) demonstrated that alcohol use has increased, and it is the most commonly used drug among young people, exceeding tobacco and illicit drug use. The survey illustrates that nearly three out of four students (77%) have consumed more than just a few sips of alcohol by the end of high school; and nearly half (46%)
have done so by 8th grade, which includes individuals who are 13 years of age or younger. More than half (58%) of the 12th graders and a fifth (20%) of the 8th graders in the 2003 study reported having been drunk at least once in their life. Thus, it can be inferred that adolescent alcohol use is on the rise with boys and girls having their first experiences with alcohol at younger ages than in the past.

Effects of Alcohol Use

Generally speaking, the increase in child and adolescent alcohol use heightens the opportunity for negative consequences. Alcohol use can obstruct judgment and can cause numerous economic, social, and physical consequences, such as unwanted sexual activity, delinquency, abuse of other drugs, violence, car accidents, and poor academic performance (Boyd, Howard, & Zucker, 1995). Stewart and Brown (1995) examined withdrawal and dependency symptoms among 166 adolescents who abused alcohol and other substances. They discovered that heavy substance use has an adverse impact on the psychosocial and physical development of adolescents, specifically impacting levels of self-control, disrupting family relationships, and decreasing academic performance. Adolescents who were classified as heavy drinkers (drinking 16 or more times per month and more than five drinks on at least one occasion) showed symptoms of dependency including physical, cognitive, and psychological disturbances as defined in the

*Diagnostic Statistical Manual of Mental Disorders - Fourth Edition Text Revision* (DSM-IV-TR). Specifically, the adolescents were found to experience withdrawal symptoms such as tremors, nausea and vomiting, depression, muscle aches, and muscle weakness that indicate alcohol dependence. Brown, Tapert, and Granholm's (2000) study of the neurocognitive effects of protracted alcohol use during adolescence demonstrated
that individuals who used alcohol during early and late adolescence displayed deficits in retrieval of verbal and nonverbal information as well as visiospatial functioning in comparison to those who did not use alcohol. In summary, alcohol use can impact an individual’s social, physical, emotional, and cognitive functioning. It can be assumed that the longer one uses alcohol, the more severe the negative consequences will be on his or her functioning.

**Adult Drinking Patterns**

Research demonstrates that adult drinking patterns are highly influenced by adolescent drinking patterns. A longitudinal study of 27,616 current and former drinkers conducted by Grant and Dawson (1997) found that more than 40% of individuals who began using alcohol before the age of 13 became alcohol dependent at some time in their lives. In a longitudinal study McCarty, et al. (2004) examined the effects of binge and heavy drinking in 6,177 men and women from late adolescence to early adulthood. Binge drinking was defined as more than four standard drinks per day for men and more than two standard drinks per day for women. Harmful drinking was defined as at least six or more drinks on one occasion in a one-month period for both men and women. The researchers found that harmful drinking during adolescence was significantly associated with harmful drinking in early adulthood for men but not women. They found that 14% of the adolescents who used harmful amounts of alcohol became adult harmful drinkers in comparison to the 4% of harmful adult drinkers who as adolescents did not drink harmful amounts of alcohol. Unlike harmful drinking, adolescent binge drinking was highly predictive of adulthood binge drinking in both men and women. More specifically, nearly one-half of binge-drinking male adolescents and one-third of binge-drinking
female adolescents continued to binge drink into adulthood. Thus, it appears that adolescent drinking patterns have a significant impact on adult use.

Even though research has found that the patterns of adolescent drinking significantly and negatively affect adult alcohol use, other research has found that alcohol use declines as a person moves into adulthood. In a longitudinal study, Kandel and Logan (1984) examined periods of risk for initiation, continued use, and discontinuation of substances from adolescence to adulthood. Data were collected from 1,325 participants who were enrolled in the 10th or 11th grade in 1971. They found that the heaviest alcohol use occurred before the age of 20 and then sharply declined, suggesting that alcohol use decreases as a person matures. Based on the results of the above studies, one can conclude that the extent to which adolescent alcohol use affects adulthood alcohol use depends on the study being conducted.

In summary, substance use, specifically alcohol use in adolescents is increasing in today's society (Johnston, O'Malley, & Bachman, 2003; Kann et al., 2000). Consequences associated with the increase in adolescent alcohol use include increased adulthood use, alcohol dependence, and impairment in physical, psychological, and cognitive functioning. Other consequences associated with alcohol use include loss of self-control, disruption in social relationships, disruption in family relationships, and poor academic performance (Boyd, Howard, & Zucker, 1995; Brown, Tapert, & Granholm, 2000; Stewart & Brown, 1995). Because of these negative effects, it is important that research identify early precursors or risk factors of alcohol use in adolescence. Knowledge of these factors would be beneficial in improving early interventions that would assist in preventing or at least delaying the initiation of alcohol use.
Personality

The notion of personality is complicated yet crucial to understanding motivation and behavior. There is controversy between theorists regarding the meaning, purpose, and importance of personality and how it affects human behavior. As cited in Engler (1995) some extremes in the notions of personality can be seen between B. F. Skinner, who believed that the concept of personality was unnecessary in understanding behaviors, and Carl Rogers who theorized that personality was a structured and consistent pattern that was the underpinning of an individual's experiences. The notions of personality have been examined over the years with a current emphasis on formulating personality theories to better understand personality characteristics on an individual level. Personality theories provide various explanations for understanding the development of personality characteristics and how those characteristics impact quality of life (Engler, 1995). One specific type of personality theory is a trait theory.

Trait Theories of Personality

Traits, as defined in Engler (1995), are relatively stable aspects of personality that are demonstrated through consistencies in behavior. Trait theories, or organized models of personality traits, focus on identifying specific characteristics that account for variability in personality. Even though there are numerous trait theories, the current research project examined one specific theory, the Five Factor Model of Personality. This theory will be discussed in detail below.

The Five Factor Model of Personality includes the factors of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. The Neuroticism (N) factor refers to the general tendency to experience negative feelings such
as fear, sadness, embarrassment, anger, guilt, and disgust (McCrae & John, 1992). This domain is comprised of characteristics such as a person’s tendency to become easily angered and/or discouraged. Other characteristics include self-consciousness, impulsivity, and vulnerability. Individuals who score high on this domain are prone to have irrational ideas, problems with impulse control, and difficulties with stress management. Conversely, individuals who score low on this domain are considered to be emotionally stable. They are usually described as calm, even-tempered, and are able to cope with stressful situations.

The second personality factor is Extraversion (E), and it is comprised of six facets including warmth, outgoingness, assertiveness, excitement-seeking, and having an overall positive disposition towards life (Costa & McCrea, 1992). Typically, individuals who score high on this domain are stimulated by large groups and activities that involve high amounts of energy. Individuals who score low on this domain are typically more reserved and more content being alone or with only a few other people rather than large social gatherings. Although introverts are not as outgoing and energetic as Extraverts, they are not usually unhappy, pessimistic, or suffering from social anxiety as it sometimes may be assumed. Overall, it can be said that a person scoring high on the Extraversion scale tends to be more socially outgoing, and a person who scores low on the scale tends to be more reserved.

The Openness to Experience or Openness (O) domain is often described by characteristics such as an active imagination, artistic sensitivity, attentiveness to inner feelings, preferences for variety, intellectual curiosity, and independence of judgment (McCrae & John, 1992). Fantasy, aesthetics, feelings, actions, ideas, and values are the
facets that are examined when determining a person’s level of Openness. Alternate forms of the five-factor model have labeled the O factor as Intellect because it has been associated with both education and measured intelligence (Costa & McCrea, 1992). People who score high on the Openness domain are unconventional, question authority, have a strong value system, and easily entertain new ethical, social, and political ideas. Individuals scoring low on the Openness domain tend to maintain conservative views and often have more conventional behaviors. Furthermore, individuals scoring lower on the Openness domain tend to have fewer and less diverse interests than individuals with higher scores.

The fourth personality factor is Agreeableness (A) and is primarily concerned with how individuals relate to one another (McCrae & John, 1992). The Agreeableness scale encompasses trust, self-expression, unselfishness, modesty, compliance to authority and/or the “norm,” and flexibility with beliefs and new ideas. Individuals who score high on this scale tend to be unselfish in nature, sympathetic, eager to help others, and believe that others are equally willing to be helpful in return. This type of individual can also adapt to the needs of a group rather than insisting on personal norms. Individuals who score low on this domain tend to be self-centered, skeptical of others’ intentions, and competitive rather than cooperative. These individuals may be described as challengers, putting their personal needs and values before those of the groups to which they belong. A person scoring high on the Agreeableness domain is often influenced by many norm sources (i.e., friends, media, and authority figures), whereas a person scoring low on the Agreeableness scale typically follows his or her personal norms or beliefs.
The final personality factor, Conscientiousness (C), considers individual differences in reference to self-control, organization, and ability to follow through with tasks. Competence, order, dutifulness, achievement striving, self-discipline, and deliberation are the facets that make up the Conscientiousness factor (Costa & McCrea, 1992). Individuals who score high on this domain can be described as purposeful, strong-willed, determined, thorough, punctual, and reliable. This factor is often associated with academic and occupational achievement; however, it is not uncommon for an excessive need for achievement and structure to lead to compulsive neatness or "workaholic" behaviors. Individuals who score low on this domain are less structured and more laissez-faire when working towards their goals. Furthermore, it is not uncommon for individuals scorning low on this domain to be more interested in having fun and have difficulties with delayed gratification.

Assessment of Personality Traits

Personality can be assessed using two main types of measures – projective tests and objective tests. Projective tests, derived from a psychoanalytic approach, involve interpretation of a vague image or scene. This interpretation yields information regarding one's unconscious motives and conflicts which compose one's personality. Examples of projective personality measures include the Rorschach Inkblot Test and the Thematic Apprehension Test (TAT) (Cullari, 2001). Even though these measures provide information about an individual's personality, these measures cannot quantify the amount of specific traits one possesses.

Objective tests, on the other hand, are derived mostly from trait theories and can be used to quantify the amount of a personality trait one possesses. Typically, objective
tests require a person to answer questions, typically on a Likert-type scale that describes aspects of his or her personality (Cullari, 2001). Examples of objective trait measures include Cattell’s Sixteen Personality Factor Questionnaire (16PF; Cattell, 1995), Myers-Briggs Type Indicator (MBTI; Myers, 1962), and the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrea, 1992). Due to the nature of the present study, the Revised NEO Personality Inventory will be reviewed.

The Revised NEO Personality Inventory (NEO-PI-R) developed by Costa and McCrea (1992) is an assessment that was derived from the Big Five Model of Personality which is presently the most widely used and accepted trait theory. As stated above, the model identifies five personality traits consisting of Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. The NEO-PI-R also assesses 30 facets (six in each domain) or characteristics that are prominent in each personality domain. There are two forms of the NEO-PI-R. The first is form S which is for self-report, and the other is Form R which is for observer ratings (Costa & McCrea, 1992). Both forms consist of 240 questions that are to be answered using a Likert scale ranging from strongly disagree to strongly agree. These factors run on a continuum from low to high which describe the extent to which each characteristic is part of an individual’s personality. An abbreviated version of the NEO-PI-R was also created called the NEO Five Factor Inventory (NEO-FFI). It assesses only the five dimensions of personality and does not include specific information about the 30 facets or characteristics that make up each domain. The NEO-FFI consists of 60 questions and utilizes that same five-point Likert scale as does the NEO-PI-R. This instrument was used in the present research.
Personality Factors and Risky Behaviors

Some studies support the idea that personality factors play a role in determining an individual's likelihood to participate in risky-behaviors, specifically alcohol use in adulthood. Kubicka, Matejcek, Dytrych, and Roth (2001) examined intelligence and the personality traits of Conscientiousness, Extraversion, and Neuroticism in childhood as predictors of drinking and smoking behavior in middle aged adults. Data were gathered over a 24-year period using 220 males and females. The participants were assessed at 9-10 years of age, 21-23 years of age, 28-31 years of age, and 32-35 years of age. As children, intelligence was assessed using the Wechsler Intelligence Scale for Children (WISC; Wechsler, 1949) and the personality characteristics were rated by parents, teachers, and peers using 11, five-point scales that assessed Conscientiousness, Extraversion, and Neuroticism. As adults, the participants were assessed using Eysenck's Questionnaire of Personality (EPQ; Eysenck & Eysenck, 1968), the Socialization Scale from Gough's California Personality Inventory (CPI; Gough & Bradley, 1996), the Anxiety Scale from the Mood Frequency Questionnaire (MFQ; Kubicka & Csemay, 1983), and a questionnaire designed by the researchers that assessed drinking and smoking behaviors. Face-to-face interviews were also conducted to assess drinking and smoking behaviors. The results demonstrated that individuals scoring low on the Conscientiousness scale and who had low intelligence scores were at a higher risk for heavy episodic drinking and smoking. It is hypothesized that this relationship emerged because individuals who score lower on the Conscientiousness domain tend to have less interest in academic pursuits and, therefore, are less receptive to information about health risks that are typically offered in the classroom. The results also indicated
that individuals scoring high on the Extraversion scale consumed higher amounts of alcohol on a daily basis. It is suggested that the social needs of Extraverts encourages involvement in frequent social drinking. No relationship emerged between Neuroticism and alcohol consumption. The authors suggest that this finding is not surprising given that individuals scoring high on the Neuroticism domain tend to be nervous and concerned about their well being, which would automatically place them at a lower risk for participation in health compromising behaviors. To review, this research demonstrates a link between the personality factors of Conscientiousness and Extraversion and adulthood alcohol use.

Austin et al. (2003) found similar results when examining the relationship between personality and substance use in 155 male and female college students and 108 male and female high school students using a self-report survey consisting of the Mini Markers Five Factors Personality Scale (Saucier, 1992) and 200 questions about substance abuse behaviors. The results indicated that there was a positive correlation between alcohol use and Extraversion because as suggested by the author Extraverts naturally prefer social situations which are common places for alcohol use during the college and high school years. A negative correlation also emerged between Openness and alcohol use. Individuals who score low on this domain tend to be less engaged in academics in comparison to individuals with higher scores. The lack of academic engagement reduces identification with positive peers and teachers which in turn increases identification with peers who endorse substance use and reinforce rebellious behaviors. To summarize, no significant correlations emerged with the factors of Agreeableness, Conscientiousness, and Neuroticism and alcohol use in college students. However, significant correlations
emerged with the factors of Extraversion and Openness and alcohol use in college students.

Other research has demonstrated a relationship between Agreeableness and alcohol use in undergraduate students. Musgrave-Marquart and Bromley (1997) examined personality, academic performance, and substance use using 161 college students. The students were administered the NEO Personality Inventory - Revised (NEO-PI-R; Costa & McCrea, 1992), the Academic Attribution Style Questionnaire (AASQ; Peterson & Barrett, 1987) and a modified substance use questionnaire. The results identified Agreeableness as the only personality factor related to alcohol consumption. A negative correlation between Agreeableness and alcohol use was detected meaning that a lower score on the Agreeableness domain was associated with higher rated of alcohol use. Furthermore, this relationship negatively affected academic performance, specifically through decreasing grades. Individuals who score low on the Agreeableness domain tend to follow personal norms rather than group norms, and they tend to not be heavily influenced by others when making decisions; therefore, it is suggested that these characteristics are influential in decision making regarding alcohol use.

To summarize, research has linked personality to alcohol use in adults. Unfortunately, as the mentioned studies demonstrate, the results have been inconsistent in regards to which personality traits appear to influence alcohol use in adults. Extraversion has been the only personality factor that has consistently and positively been related to alcohol use in adults. Even though research has examined personality factors and alcohol use in adults, less research has been devoted to the examination of these personality factors in adolescent behavior.
One of the most recent studies that examined personality factors and adolescent risky behavior was conducted by Gullone and Moore (2000). They examined risk taking behaviors (thrill-seeking behaviors, antisocial behaviors, reckless behaviors, and rebellious behaviors) and personality traits in 459 adolescent boys and girls, ages 11 through 18, by using the Adolescent Risk-taking Questionnaire (ARQ; Gullone & Moore, 2000) and the NEO Five Factor Inventory (NEO-FFI; Costa & McCrea, 1992).

Results of multiple regression analyses demonstrated that Extraversion accounted for variance in thrill-seeking behaviors. Specifically, higher scores on the Extraversion scale were related to higher reports of participation in thrill-seeking behaviors, which are behaviors that are viewed as challenging but socially acceptable for both adults and adolescents. The authors (Gullone & Moore, 2000) hypothesized that a primary characteristic of Extraverts is to seek out excitement, which would create a natural tendency to participate in more thrill-seeking activities in comparison to introverted individuals.

Neuroticism accounted for variance in antisocial behaviors. Specifically, individuals scoring higher on this domain were more likely to report lower instances of participation in antisocial behaviors, which are behaviors that are viewed as socially unacceptable for both adults and adolescents and typically result in negative consequences. The authors (Gullone & Moore, 2000) hypothesized that individuals who score high on the Neuroticism domain tend to be worrisome and concerned with their well-being which easily explains the lower rates of participation in these behaviors since participation in risky behavior often involves a disregard for consequences.
Higher scores on the Conscientiousness scale were associated with lower rates of participation in rebellious and reckless risk-taking behaviors. Conscientious individuals are described as hardworking, organized, and concerned with their future. The authors (Gullone & Moore, 2000) proposed that because highly conscientious individuals tend to follow societal norms and not ignore them, they would be less likely to participate in behaviors that would jeopardize their hard work and dedication to self-improvement.

Adolescents scoring higher in Agreeableness reported higher levels of rebellious behaviors such as drinking alcohol. Gullone and Moore (2000) suggested that the trusting nature of a person scoring high on the Agreeableness scale would increase susceptibility to peer pressure, therefore leading to increased involvement in risky behaviors.

Openness to Experience did not account for variance in any of the behaviors. The authors (Gullone & Moore, 2000) suggested that the lack of significant findings regarding Openness to Experience and risk taking behaviors was surprising considering that individuals who score high on this domain are often described as daring and interested in new ideas and activities. In summary, the personality factors of Extraversion, Conscientiousness, Agreeableness, and Neuroticism accounted for a significant amount of variance in participation in risky behaviors. Openness to Experience was the only factor that did not emerge as a significant influence on participation in risky behaviors.

Overall, the results of these studies with adults and adolescents indicate that personality factors influence alcohol use in adults and adolescents. As previously mentioned, the results have been inconsistent with the exception of the personality factor
Extraversion. More research needs to be conducted to further examine and understand the relationship between personality and alcohol use, especially in adolescents.

**Developmental Factors**

Puberty is another factor that has been found to be associated with risky behavior and alcohol use. Puberty is often viewed as an intense period of life in which a person experiences many physical, psychological, emotional, and social changes. Puberty can be defined as the stage of development that signifies the beginning of adolescence and is characterized by reaching sexual maturity and the ability to reproduce. The average age for the onset of puberty is 11 years old in females, and 13 years old in males (Kelly, 2001).

Research has indicated that the timing of puberty affects one’s emotional and psychological functioning as well as behavioral functioning. A study dating as early as 1950 found that the timing of physical maturation can affect a child’s social and emotional adjustment (Jones & Bayley, 1950). However, the effects of pubertal timing may differ depending if one is male or female. Ge, Conger, and Elder (1996) examined pubertal influences on psychological distress using a sample of 236 adolescent girls. The participants completed self-report measures that assessed psychological distress and maturation level over four waves. Participants completed five scales from the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994), The Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1991), and the Deviant Peers Scale (Elliott, Huizinga, & Ageton, 1985). Teachers and mothers of the participants completed the anxiety/depression subscale from the Teacher Report Form (TRF; Achenbach, 1991).
Both fathers and mothers completed three items from the NEO Personality Inventory (NEO-PI; Costa & McCrea, 1985). Finally, fathers completed the six-item hostility scale from the SCL-90-R (Derogatis, 1994). Maturational level was classified as early, on-time, or late as determined by the age at first menarche. Girls who began menstruation before the age of 12.5 were considered early maturers, those who began between the ages of 12.5 and 13.5 were considered on-time maturers, and those who began after the age of 13.5 were considered late maturers. The results indicated that early maturing girls consistently experienced higher levels of psychological distress, such as lower self-esteem and depression in comparison to on-time and late maturers.

Similarly, Sonis, Comit, and Blue (1985) examined behavior problems in girls with precocious puberty using self-report measures. Precocious puberty was defined as the onset of secondary sexual characteristics before the age of nine. The participants included 33 girls between ages 6 and 11 who experienced precocious pubertal onset. The results indicated that girls who experienced early pubertal onset had more problematic behaviors than girls with on-time or late onset of puberty. Specifically, early maturers demonstrated higher levels of depression, aggression, social withdrawal, sleeping problems, and obsessive behaviors.

In a study of 1,709 high school students, Graber, Lewinsohn, Seeley, and Brooks-Gunn (1997) investigated psychopathology and pubertal onset through the use of interviews that used the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Kaufman, Birmaher, Brent, Rao, & Ryan, 1996) and a battery of self-report questionnaires that covered a range of psychosocial variables. They found that early maturing girls were more likely to participate in risky behaviors such as
drinking alcohol and smoking cigarettes than on-time or late maturing females. In addition, earlier maturing females were also more likely to have lower self-esteem, poor coping skills, higher levels of truancy, and more suicide attempts which were possibly influential on decisions to use alcohol and nicotine.

A national study of 1,800 girls between the ages of 15 and 19 found that girls who started puberty earlier often began dating and having sexual intercourse younger than their classmates who experienced on-time or late pubertal onset (Phinney, Jenson, Olsen, & Cundick, 1990). Stice, Presnell, and Bearman (2001) examined early menarche, depression, eating disorders, substance abuse, and comorbid psychopathology. The study examined 496 adolescent girls ranging in age from 11 to 15. Participants completed a self-report questionnaire which assessed substance use, body satisfaction, and dieting behaviors. They also participated in a structured interview which assessed depression, age of menarche, and eating pathologies. Results indicated that early menarche was associated with elevated levels of depressive symptomatology, eating disorders, substance use, and substance abuse symptoms in adolescent females.

Numerous explanations have been proposed as to why the onset of puberty affects psychological and emotional functioning. As cited in Stice et al. (2001), early developing females are confronted with stressors and new situations that they are not psychologically prepared to successfully manage. Another explanation suggests that early development could promote feelings of alienation and depression due to the lack of similarities they would have with peers who experience on-time or late development. The final explanation focuses on weight gain, a natural occurrence in the process of puberty. It is not uncommon for weight gain to result in body dissatisfaction that occurs as the girl
moves away from her ideal body image, increasing the likelihood for psychological distress. It can be concluded that the psychological distress, often associated with girls who have an early onset of puberty, is highly influential in their participation in risky behaviors, including substance use.

The examination of pubertal timing in males, however, has produced less consistent results. An early study suggests that early pubertal onset for males may be beneficial in that it increases social acceptance and adjustment, which is possibly influenced by the social prestige and leadership that physical power and an athletic build brings to early-maturing boys (Jones & Bayley, 1950). Late maturers have been found to be more dependent and insecure. Furthermore, late maturing males tended to be more childish, eager, and less relaxed, and generally engaged in more attention-seeking behaviors (Jones & Bayley, 1950).

Ge, Conger, and Elder (2001) examined psychological distress and pubertal onset in males through self-report measures. The measures used in this study were the Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 1994), Junior High Life Experience Survey (JHLES; Swearingen & Cohen, 1985) and the Pubertal Development Scale (PDS; Petersen, Crockett, Richards, & Boxer, 1988). Data were collected from the Iowa Youth and Families Project of 451 families when the boys were 12, 13, and 14 years old. The results indicated that boys who developed earlier in relation to their peers had more psychological distress and problems with anger because they had less time to prepare and develop necessary skills for coping with emotional changes and abilities to adapt to new social situations in comparison to on-time and late-developers. This means that early maturing boys are experiencing distress due to expectations to function at a cognitive
level that they are not yet prepared. Ge et al. (2001) indicated that this effect was less severe when measures were obtained from adolescent boys who were in the ninth grade or higher due to the less noticeable difference between height, weight, and levels of maturity in the population. This implies that in this age group the onset of puberty plays a decreased role in psychological distress. Therefore focusing on a younger population would provide more accurate results as to the effects of puberty and emotional distress.

Felson and Haynie (2002) conducted a longitudinal study that examined the relationship between pubertal development, social factors, and delinquency among adolescent boys using 5,700 participants ages 12 through 16. They gathered information from the adolescents, their parents, and their friends regarding development, delinquency, aggressive behaviors, sexuality, substance use, family background, and peer behaviors through the use of self-report questionnaires. Delinquency, self-esteem, and independence were assessed using measures created by the authors. Depression was assessed using a self-report depression scale consisting of 19 items and pubertal development was assessed using the Pubertal Development Scale (PDS; Petersen et al., 1988). The results of the study indicated both positive and negative results as a result of pubertal development in adolescent boys. The positive results indicated that early maturing boys tended to make better grades, be more popular, and were psychologically healthier; however, the results also indicated that early maturing boys were more likely to engage in violence, property crime, illicit drug use, and sexual behaviors.

Overall, some research suggests that earlier maturing boys are more confident and secure. They experience less psychological distress than boys who mature on-time or late, making them less likely to participate in risky behaviors. Other research suggests that
early puberty is more likely to cause social, emotional, and personal problems which could be a precursor to participation in risky behaviors such as alcohol use. More information and research is needed to further understand other variables that may influence the behaviors, especially substance use, in adolescent males.

*Pubertal Onset and Substance Use*

Not only has research documented that the timing of pubertal onset affects psychological and behavioral functioning, research has also documented that the onset of puberty is related to substance abuse. Martin, Logan, Leukefel, Milich, Omar, & Clayton (2001) conducted a longitudinal study using 2,071 male and female students from 6th to 10th grade. The study analyzed adolescent and young adult sensation seeking and substance use in association with early pubertal onset. The participants were asked to retrospectively report gender specific pubertal markers at six-month intervals between the ages of 10 and 17.5. Additionally, the participants self reported their drug use patterns on five occasions throughout the study, which included past month’s use of cigarettes and alcohol. Results indicate that greater alcohol use was associated with 9th and 10th grade boys who had early pubertal onset. Furthermore, increased cigarette use was discovered in girls who began puberty early in comparison to their peers. The results also revealed that sensation seeking was significantly lower in girls and boys who experienced late pubertal onset. An interaction between pubertal onset and sensation seeking was an indicator of cigarette use by 8th and 9th grade girls and alcohol use by 9th grade boys. This research indicates that the timing of puberty and the level sensation seeking are influential in cigarette and alcohol use in adolescent boys and girls.
Tschann et al. (1994) conducted research on students in the 6th and 7th grades to examine the roles of pubertal timing and emotional distress in relation to the initiation of substance abuse. A total of 332 boys and girls were assessed on two occasions as part of a larger study examining health related behaviors. The participants completed self-report measures regarding sociodemographic information, level of maturation, emotional distress, and substance use. Results demonstrated that girls reported more emotional distress than boys, and that emotional distress was related to substance use which, as suggested, may act as an escape-avoidance coping strategy. Additionally, the results validated that early maturers of both genders were more likely to use substances when compared to later maturing adolescents; however, maturity was not found to be a significant predictor of emotional distress.

Further evidence of a relationship between pubertal development and substance use can be found in research conducted by Dick, Rose, Pulkkinen, and Kapiro (2001). They collected data from *FinnTwin12*, which is an on-going population based study of five consecutive birth cohorts of Finnish twins, born from 1983 to 1987. The Peterson Pubertal Development Scale (PDS; Petersen et al., 1988) was administered to participants when they were 12 and 14 years of age. Questionnaires using Likert-type scale items asked the twins to self-report on their cigarette, alcohol, and drug use and that of their friends. Results demonstrated that both earlier developing boys and girls engaged in substance use more than later developing boys and girls.

Similarly, Wichstrom (2001) through the use of self-report measures examined alcohol use and pubertal timing in 12,287 individuals. The participants rated their substance use and problem behaviors via questionnaires that utilized a Likert-type scale
and pubertal timing was measured using the Pubertal Development Scale (PDS; Petersen et al., 1988). The results indicated that early timing of pubertal onset was correlated with alcohol use among adolescents, with a stronger correlation found in boys. Additionally, boys who experienced late pubertal onset became intoxicated considerably less often than those who experienced early or normal onset. It is suggested that late maturing males are often socially excluded because of lower physical, social, and sexual attractiveness. It is not uncommon for these individuals to report lower rates of intoxication, possibly due to the lack of exposure. Early maturing adolescents, particularly males, tend to interact more frequently with friends who drink and display more problem behaviors.

In summary, research has determined that personality factors are related to substance use. Research has also found that the onset of puberty (early vs. late) is related to behavioral and psychological functioning which in turn influences substance use in both males and females. However, minimal research to date has focused on the combined effect of personality and onset of puberty and how these factors interact to influence behavior, specifically early adolescent alcohol consumption.

One of the only published studies to date to examine these factors together is a study conducted by Markey, Markey, and Tinsley (2003). They examined the Five Factor Model of Personality, puberty, and preadolescent girls' risky behaviors in a longitudinal study using 60 girls and their mothers. The participant completed two sets of questionnaires on two different occasions. The first administration was given when the girls were in the 5th grade, and the second administration was given when the girls were in the 6th grade. The Tanner Growth Ratings Scales (Marshall & Tanner, 1969) were used to assess five stages of pubertal growth of the breasts and pubic hair to track
development. The Peterson Pubertal Development Scale (PDS; Petersen et al., 1988) was used as a self-report to measure the individuals’ perceived growth. The participants and their mothers were given the NEO-FFI (Costa & McCrea, 1992) to rate their personalities. Additionally, when the girls reached the sixth grade they completed the Risk Behavior Assessment (RBA; National Institute on Drug Abuse, 1993) which was designed to assess preadolescent participation in health-compromising or risky behaviors such as early sexual behaviors, smoking, and alcohol consumption (Markey et al., 2003).

Analyses revealed a positive relationship between girls’ pubertal development and their participation in health-compromising behaviors, indicating that girls who reached puberty at a younger age were more likely to participate in risky behaviors such as smoking, and alcohol consumption. Additionally, a significant negative relationship emerged between Conscientiousness and Agreeableness and participation in risky behaviors, meaning that girls who scored lower on the Conscientiousness domain and lower on the Agreeableness domain were more likely to participate in risky behaviors. The authors (Markey et al., 2003) suggest that individuals with similar scores are often described as being irresponsible, unkind, and rebellious, making them susceptible to participation in risky activities. When examining the interaction between personality factors and pubertal onset, results revealed that Openness to Experience significantly interacted with measures of pubertal development. A positive relationship emerged between Openness and risky behaviors but only when girls developed earlier in relation to their peers. Specifically, early maturing females engaged in health compromising behaviors such as smoking and alcohol consumption. The researchers suggest that this result is not surprising because a girl who is open to experience would tend to have
increased levels of curiosity and eagerness to explore new situations that she would have access to due to her newly mature appearance.

Overall, this study suggests that early developing females, who report higher levels on the Openness scale, are more likely participate in risk taking behaviors, such as alcohol use. No significant interactions were noted with the other personality factors, pubertal onset, and risk-taking behaviors. However, given the different effects of pubertal timing in males, compared to females, it is unknown if similar results would be obtained when examining pubertal level, personality factors, and alcohol use in preadolescent and adolescent males.

Therefore, the purpose of the current study was to further examine the effects of pubertal onset and personality factors, specifically three personality factors of Conscientiousness, Extraversion, and Openness in preadolescent and boys to see how these factors influence their risk taking behaviors, specifically the risk taking behavior of alcohol use. A number of hypotheses were proposed. First, it was expected that the three personality factors of Conscientiousness, Extraversion, and Openness would significantly predict the level of alcohol use. More specifically, lower scores on the Conscientiousness scale would significantly predict higher scores of alcohol involvement on the risk behavior scale because individuals who score lower on the Conscientiousness scale tend to be more disorganized and less concerned with structure and meeting goals in comparison to those individuals who score higher on this scale. Consequently, the characteristics associated with lower scores on the Conscientiousness scale could cause a person to be more susceptible to participation in risky behaviors such as alcohol use. Higher scores on the Extraversion scale would significantly predict higher alcohol
involvement scores on the risk behavior scale because individuals who score higher on
the Extraversion scale tend to enjoy and thrive in situations that are high in energy and
excitement, which may increase the participation in risky behaviors. Finally, lower scores
on the Openness domain would predict higher scores of alcohol involvement on the risk
behavior scale. Individuals who score lower on the Openness scale tend to be less
interested in new ideas and academics and more likely to conform to that of negative
peers, thus increasing the chances of using alcohol.

Second, it was expected that the level of pubertal development would significantly
predict the level of alcohol involvement. More specifically, higher scores on the Pubertal
Development Scale, indicating early pubertal onset, would significantly predict higher
scores of alcohol involvement on the risk behavior scale because males who develop
earlier tend to socialize and engage in activities with individuals who are older than
themselves; a consequence of these social interactions would include increased access
and pressure to participate in risky behaviors such as drinking alcohol. Finally, it was
expected that the interaction of the scores obtained from both personality factors
(Conscientiousness, Extraversion, and Openness) and level of pubertal development
would account for a significant amount of variance in the level of alcohol involvement
scores obtained from the risk behavior scale. The interaction of personality factors and
the onset of puberty may exacerbate participation in risky behaviors, suggesting that the
combination of the multiple factors may be more influential and significant in predicting
adolescent male participation in risky behaviors than when only a single factor is
examined.
Methodology

Participants

The present study examined 100 boys currently in the 6th, 7th, or 8th grades along with their parents in the present study. Participants were recruited from local school systems in a medium sized city in the Midwestern region of the United States. The boys in the study had a mean age of 12.4 years with a standard deviation of .89 and a range of 11 to 15. Of the 100 parents who participated, 75.3% were mothers, 19.6% were fathers, and 5.0% were custodial grandparents. The majority (76.5%) of the participants were Caucasian, with 12.2% being African American, 6.1% being Latino/Hispanic, 4.1% being Asian, and 1.0% being Pacific Islander. Participants were predominantly from married middle- to upper-middle class families.

The boys had a mean score of 10.35 with a standard deviation of 3.39 on the Self-Rating Scale for Pubertal Development meaning that the average participant described himself as being in the late stages of puberty, indicating early pubertal onset. Of the boys who completed the Self-Rating Scale for Pubertal Development, 1 was classified as prepubertal, 5 were classified as being in the early stages of pubertal development, 25 were classified as mid-pubertal or experiencing on time development, 35 were classified as late pubertal or in the later stages of development, and 34 were classified as post pubertal indicating that puberty was complete. Descriptive information gathered from the Adolescent Risk Taking Questionnaire (Risk Behavior Assessment) found that the majority (86.1%) of boys reported never participating in underaged drinking, with 5.9% reporting hardly ever participating in underaged drinking, 5.9% reporting sometimes participating in underaged drinking, and 2.0% reporting often participating in underaged
drinking. Additionally, the majority of the participants reported never getting drunk (92%) with 5.9% reporting hardly ever getting drunk, 1.0% reporting sometimes getting drunk, and 2.0% reporting getting drunk often.

**Measures**

*Demographics Questionnaire*

Each participant’s parent completed a demographics questionnaire (See Appendix A) which provided demographic information such as income, ethnicity, and educational level. Information from this questionnaire was used for descriptive purposes.

*Adolescent Risk Taking Questionnaire (ARQ)*

The ARQ (Gullone & Moore, 2000) is a two-part, self-report questionnaire that provided an assessment of the extent to which an adolescent engages in both positive and negative risk-taking behaviors (See Appendix B). Both sections of the questionnaire included 22 behaviors that could be described as risky. In the first section of the assessment (Risk Behavior Questionnaire), the adolescents described their participation in the each behavior by using a five-point scale with responses that ranged from *Never Done* to *Done Very Often*. The second section (Risk Belief Questionnaire) assessed their beliefs on how risky they perceived each activity to be using a five-point scale responses ranging from *Extremely Risky* to *Not at all Risky*. The ARQ (Gullone & Moore, 2000) identifies four aspects of adolescent risk-taking behavior: Thrill-Seeking Behaviors (positive risk-taking), Rebellious Behaviors (negative risk-taking), Reckless Behaviors (negative risk-taking), and Antisocial Behaviors (negative risk-taking). A summation of the scores on the first part of the assessment or the Risk Behavior Questionnaire assessed participants' level of involvement in each of the four categories of risk-taking behaviors.
Two questions were selected to be indicators for alcohol use; specifically, questions regarding participation in underaged drinking (question 8) and getting drunk (question 14). The ARQ has been shown to have sound psychometric properties (Gullone & Moore, 2000). Gullone and Moore (2000) reported Cronbach alphas that ranged from .70 to .80 on the four scales. The questionnaire has good to strong internal consistency. Furthermore, adequate test-retest reliability has been demonstrated with coefficients ranging from .60 to .80 (Gullone & Moore, 2000).

**NEO Five Factor Inventory (NEO-FFI)**

The NEO Five Factor Inventory (Costa and McCrae, 1992) is a 60-item, standardized, self-report measure of the five major dimensions of personality and was used to obtain a brief, comprehensive assessment of adolescent personality. The dimensions, otherwise known as the "Big Five," are Openness (O), Conscientiousness (C), Extraversion (E), Agreeableness (A), and Neuroticism (N). Each of the 60 items was answered on a five-point Likert Scale ranging from *strongly disagree* to *strongly agree*. A summation of the scores provided raw scores for the five domains. The raw scores are converted to T-scores which measures where each participant falls on the continuum of each personality domain, with scores ranging from 25 to 75. The NEO-FFI scales have adequate reliability and validity with correlations of .75 to .89 with the NEO-PI-R factors. Internal consistency (Cronbach's alphas) values range from .74 to .89 (Costa & McCrae, 1992).

This scale was normed on adults, but previous studies found that when adolescents and their parents are administered the measure the results are highly correlated (Markey et al., 2003). Because of the differences in reading levels in adolescents, Markey et al. (2003) modified 44 of the 60 questions by creating verbal prompts to clarify some of the
words. For example, "polite" was used to clarify the meaning of the word "courteous" on item number four (Markey et al., 2003). The items that were modified were 3-6, 9-16, 18-21, 23-26, 29-31, 33, 35, 37-40, 42-51, 53, 55-56, and 58-59 (See Appendix C).

_Self-Rating Scale for Pubertal Development_

The Self-Rating Scale for Pubertal Development (Carskadon & Acebo, 1993) is a standardized self-report questionnaire which was adapted from the Pubertal Development Scale (Petersen, Crockett, Richards, & Boxer, 1988) and was used to assess participants' level of pubertal development (See Appendix D). The Self-Rating Scale for Pubertal Development consists of five questions. The scale has three questions that are gender neutral, and two questions that are gender specific. For the purposes of this study, the three gender neutral questions and two questions that are specific to development in males were administered. Each question was assigned a value ranging from one to four, with one being _not yet started_ and four being _seems complete_. The values of each answer were summed to give a Total Development Scale score ranging from 3 to 12. Scores of 3 or below indicate _Prepubertal_ development, scores between 4 and 5 indicate _Early Pubertal_ development, scores between 6 and 8 indicate _Midpubertal_ development, scores between 9 and 11 indicate _Late Pubertal development_, and a score of 12 or more indicates _Post Pubertal_ development. When correlated to the Tanner Growth Ratings Scales (Marshall & Tanner, 1969), a commonly used assessment that utilizes drawings to determine levels of pubertal development, the correlation coefficient ranged from .51 to .80 (Brooks-Gunn, Warren, Rosso, & Gargiulo, 1987). The Self-Rating Scale for Pubertal Development has adequate reliability with internal consistency ranging from .54 to .67 (Brooks-Gunn et al., 1987).
Procedure

After obtaining approval from the local school board (See Appendix E) and Human Subjects Review Board at Western Kentucky University (See Appendix F), participants were recruited through local school systems. Teachers gave boys who fell in the grade range a brief written explanation of the study, a parental consent form (See Appendix G), demographics questionnaire, and a request for results form that was completed by the parent and returned to the adolescent's homeroom teacher. As part of the consent process, both parents and adolescents were reminded that they could withdraw from the experiment at any time without penalty or prejudice. The investigator collected the returned forms and scheduled a time to meet with the participants during school hours. On a given day and time, each student who had parental consent completed a set of forms and questionnaires that included an assent form, the Self-Rating Scale for Pubertal Development (Carskadon & Acebo, 1993), the modified NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992; Markey et al., 2003), and the Adolescent Risk-taking Questionnaire (ARQ; Gullone & Moore, 2000). The questionnaires were presented in a counterbalanced order to prevent order effects. Upon completion of the assessment measures, the participants were given a debriefing statement and a free game or movie rental from Blockbuster Video as an incentive for participation. The parents' names were also entered into a lottery for a $20.00 gift certificate to a local business. The winner was notified by mail. The results of the study were made available to the students and parents upon completing a request form that was sent home before beginning data collection.
Results

Descriptive and Correlational Analyses

Descriptive statistics were run on all major variables of interest. The variables of Extraversion, Openness to Experience, Conscientiousness, and level of pubertal development were used as independent variables and underaged drinking and intoxication were denoted as dependent variables. They are summarized in Table 1. Overall, the participants mean score was in the average range of Extraversion, in the low range of Openness to Experience, and in the low range of Conscientiousness. The mean pubertal development score of 10.35 means that average participant is in the Late Pubertal stage of development, signifying early onset of puberty. The values assessing underaged drinking and intoxication fell in the range of "0" to "4" with 0 representing the lowest frequency of use and 4 representing the highest frequency. Therefore, a mean score of .57 on Question 8 indicates minimal reports of underaged drinking and a mean score of .49 on Question 14 also indicates minimal reports of getting drunk.

Pearson correlations were used to identify any relationships between variables. A strong significant positive correlation emerged between the personality factors of Extraversion and Conscientiousness ($r = .53, p < .001$). A weak but significant correlation emerged between Openness to Experience and getting drunk ($r = .17, p < .05$). A strong significant positive correlation was found between underaged drinking and getting drunk ($r = .78, p < .01$). Furthermore, analyses identified a significant moderate positive relationship between early pubertal onset and reports of underaged drinking ($r = .31, p < .01$) and getting drunk ($r = .32, p < .001$).
Table 1

Descriptive Statistics and Pearson Correlations of Independent Variables (Extraversion, Openness to Experience, Conscientiousness, Pubertal Development Score) and Dependent Variables (Underaged Drinking and Getting Drunk)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td>1. Extraversion</td>
<td>---</td>
<td></td>
<td></td>
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<td></td>
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<td>3. Conscientiousness</td>
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<td>.15</td>
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<td>4. Pubertal Development Score</td>
<td>.06</td>
<td>.05</td>
<td>-.01</td>
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<tr>
<td>5. Underaged Drinking</td>
<td>.03</td>
<td>.08</td>
<td>.00</td>
<td>.30**</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>6. Getting Drunk</td>
<td>.00</td>
<td>.17*</td>
<td>-.08</td>
<td>.32**</td>
<td>.78**</td>
<td>---</td>
</tr>
</tbody>
</table>

|M| 54.36| 42.05| 44.15| 10.29| .19| .11|
|SD| 9.31| 7.38| 13.56| 3.38| .57| .49|

Note: M = Mean. SD = Standard Deviation. *p < .05. **p < .001

Main Analyses

The independent variables in this study were T-scores for Extraversion, T-scores for Openness to Experience, T-scores for Conscientiousness obtained from the NEO-FFI and the total raw score for Pubertal Development obtained from the Self-Rating Scale for Pubertal Development. The endorsed score from the Adolescent Risk Taking Questionnaire, ranging from 0 to 4, was used to measure the dependent variables underaged drinking and intoxication.
Underaged Drinking

Multiple regressions were conducted to determine how much variability in the dependent variable (underaged drinking) was accounted for by the independent variables (Extraversion, Openness to Experience, Conscientiousness, and the timing of pubertal onset). Regression results indicate that the overall model of the four predictors (Extraversion, Openness to Experience, Conscientiousness, and the timing of pubertal onset) significantly predicts underaged drinking, $R^2 = .10$, $R^2_{adj} = .06$, $F(4, 93) = 2.58$, $p < .05$. However, this model only accounts for 10% of variance in reports of underaged alcohol use. A summary of the regression model is presented in Table 2. In addition, bivariate and partial correlation coefficients between each predictor and the dependent variable are presented in Table 3.

Table 2

Summary of Standard Regression Analyses for Variables Predicting Underage Drinking

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$\Delta R^2$</th>
<th>$F_{chg}$</th>
<th>$P$</th>
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<td>0.10</td>
<td>2.58</td>
<td>&lt;.05</td>
<td>4</td>
<td>93</td>
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</table>
Table 3

*Coefficients for Standard Regression Analyses for Variables Predicting Underage Drinking*

<table>
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<tr>
<th></th>
<th>B</th>
<th>β</th>
<th>T</th>
<th>Bivariate r</th>
<th>Partial r</th>
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<td>Extraversion</td>
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<td>0.01</td>
<td>0.11</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Openness to Experience</td>
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<td>0.07</td>
<td>0.70</td>
<td>0.08</td>
<td>0.07</td>
</tr>
<tr>
<td>Conscientiousness</td>
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<td>-0.00</td>
<td>-0.07</td>
<td>0.00</td>
<td>-0.00</td>
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<tr>
<td>Pubertal Development Score</td>
<td>0.05</td>
<td>0.01</td>
<td>3.05*</td>
<td>0.30</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Note: *p < .05.

*Getting Drunk*

Multiple regressions were conducted to determine how much variability in the dependent variable (getting drunk) was accounted for by the independent variables (Extraversion, Openness to Experience, Conscientiousness, and the timing of pubertal onset). Results indicate that the overall model of the four predictors (Extraversion, Openness to Experience, Conscientiousness, and the timing of pubertal onset) significantly predicts using alcohol to the point of drunkenness, $R^2 = .139$, $R^2_{adj} = .102$, $F(4, 93) = 3.758, p < .005$. However, this model only accounts for 13% of variance in reports of getting drunk. A summary of the regression model is presented in Table 4. In addition, bivariate and partial correlation coefficients between each predictor and the dependent variable are presented in Table 5.
Table 4

*Summary of Standard Regression Analyses for Variables Predicting Getting Drunk*

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$\Delta R^2$</th>
<th>$F_{chg}$</th>
<th>$P$</th>
<th>df1</th>
<th>df2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting Drunk</td>
<td>0.37</td>
<td>0.13</td>
<td>0.10</td>
<td>0.13</td>
<td>3.75</td>
<td>&lt;.01</td>
<td>4</td>
<td>93</td>
</tr>
</tbody>
</table>

Table 5

*Coefficients for Standard Regression Analyses for Variables Predicting Getting Drunk*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$T$</th>
<th>Bivariate $r$</th>
<th>Partial $r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraversion</td>
<td>0.00</td>
<td>0.01</td>
<td>0.14</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>0.01</td>
<td>0.16</td>
<td>1.71</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.00</td>
<td>-0.11</td>
<td>-0.97</td>
<td>-0.08</td>
<td>-0.10</td>
</tr>
<tr>
<td>Pubertal Development Score</td>
<td>0.04</td>
<td>0.31</td>
<td>3.23*</td>
<td>0.32</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Note: *p < .01.
Discussion

The current study examined the Five Factor Model of Personality, specifically the factors of Extraversion, Openness to Experience, and Conscientiousness and the level of pubertal development as predictors of preadolescent and adolescent male participation in risky behaviors, specifically underaged alcohol use and intoxication. Correlational analyses revealed a significant positive relationship between the personality factors of Extraversion and Conscientiousness such that higher scores on the Extraversion domain were related to higher scores on the Conscientiousness domain. A significant positive but weak relationship emerged between Openness to Experience and intoxication, which indicated that higher scores on the Openness to Experience domain were related to higher reports of getting drunk. A significant positive correlation emerged between the total development score and underaged drinking, indicating that early onset of puberty was related to higher reports of underaged drinking. Finally, a positive correlation emerged between pubertal development and intoxication indicating that early onset of puberty was related to higher reports of intoxication.

**Personality Factors and Pubertal Development**

It was predicted that the both personality factors (Extraversion, Openness to Experience, Conscientiousness) and pubertal development (TotDev) would account for a significant amount of variance in underaged drinking and intoxication in preadolescent and adolescent males. The results demonstrated that an overall model existed, however the effect was only found with pubertal development. Furthermore, the effect of pubertal development accounted for minimal variance as an overall predictor of both underaged
drinking and getting drunk, suggesting that other, unknown factors are more influential as predictors of the specified behaviors in this population. These results did not support the current hypothesis that the combination of personality factors and early pubertal onset would account for variance in adolescent male alcohol use. Furthermore, these results are different from Markey et al.'s (2003) study which found that personality factors interacted with pubertal onset as a predictor of alcohol use, specifically Openness to Experience being a risk factor when combined with early pubertal onset.

There are many possible reasons why the present study contradicted previous research. First, this study only examined male participants whereas Markey et al.'s (2003) study focused only on females making it difficult to understand whether the results were gender biased or if other factors were accounting for the findings. Another possible reason for these results involves the geographic location in which the study was conducted. The current study was conducted on a predominantly homogeneous sample in a town located in the mid-western part of the United States. Markey et al.'s (2003) study examined a more diverse sample that was located on the west coast of the United States. The geographic location represented in each study is important because individuals living in the mid-western United States are generally more conservative than individuals living on the west coast of the United States, possibly influencing a difference in alcohol use. Furthermore, the lack of diversity in the current sample may have underrepresented the true nature of alcohol use in the area. Other possible explanations include the relatively young ages of participants and the dependency on self-report measures for obtaining data. The age of participants may have influenced actual exposure to unsupervised situations that typically allow for underaged drinking or getting drunk. Also, it is possible that by
using self-report measures the participants were not completely honest about their experiences due to concerns regarding how the information would be used.

**Personality Factors**

Specific hypotheses were generated to examine personality factors as predictors of underaged drinking and getting drunk. First, it was hypothesized that higher scores on the Extraversion personality factor would predict higher levels of alcohol use in preadolescent and adolescent males. Analyses indicated that Extraversion did not account for a significant amount of variance in underaged drinking and intoxication. This result did not support the hypothesis and was surprising due to the extensive amount of research that demonstrated that the higher scores on the Extraversion domain have been linked to reports of alcohol use in older adolescents and adults. Specifically, individuals who were more outgoing and sensation seeking were more likely to report high instances of alcohol use (Austin et al., 2003; Gullone & Moore, 2000, Kúbicka et al., 2001; Musgrave-Marquart & Bromley, 1997).

The second hypothesis regarding personality factors suggested that lower scores on the Openness domain would significantly predict higher reports of alcohol use, specifically underaged drinking and getting drunk. Analyses indicated that Openness did not account for a significant amount of variance in underaged drinking and intoxication. The results did not support the hypothesis and contradict past research suggesting that lower scores on the Openness to Experience domain have been linked to reports of alcohol use. Specifically, individuals who were less interested in new ideas and academics reported higher levels of alcohol use (Austin et al., 2003). However, it is important to note that there have been inconsistent findings in previous research
regarding the personality factor Openness to Experience as a predictor of alcohol use. Specifically, one study hypothesized that higher scores on the Openness to Experience domain would predict higher levels of risk-taking behaviors, including underaged drinking and intoxication (Gullone & Moore, 2000). The researchers assumed that individuals scoring high in this domain are often interested in new ideas and activities increasing the likelihood of participation in risk-taking behaviors.

The third hypothesis regarding personality factors suggested that lower scores on the Conscientiousness domain would predict higher levels of alcohol use in preadolescent and adolescent males. The results did not support the hypothesis and also contradicts previous research. Specifically, previous research demonstrated that lower scores on the Conscientiousness domain have been linked to reports of alcohol use in adults and adolescents (Gullone & Moore, 2000, Kubicka et al., 2001; Musgrave-Marquart & Bromley, 1997).

There are many possible explanations as to why the personality factors of Extraversion, Openness to Experience, and Conscientiousness did not account for variance in underaged drinking and intoxication. Most importantly, there was a lack of endorsement of alcohol use which made it difficult to assess for variability. As previously mentioned, this was probably influenced by the young ages of participants, the geographic location in which the study was conducted, the lack of diversity within the sample.

Pubertal Development

The fourth hypothesis suggested that early onset of pubertal development would significantly predict the level of alcohol use, specifically underaged drinking and
intoxication in preadolescent and adolescent boys. The results supported this hypothesis and are consistent with previous research that suggests early pubertal onset in boys is related to risk taking behaviors, such as alcohol use (Felson & Haynie, 2002; Ge et al., 2001; Graber et al., 1997; Sonis et al., 1985; Stice et al., 2001).

Explanations for the effect of pubertal development on alcohol use are derived from limited past research suggesting that boys who develop earlier in relation to their peers are expected to handle normal adolescent crises in ways that are not developmentally appropriate. These expectations could lead to participation in risky behaviors due to increased emotional and psychological distress associated with the added responsibility (Feslon & Haynie, 2002; Wichstrom, 2001). Furthermore, the physical element of early pubertal onset increases the likelihood of social involvement with older peers, which is likely to increase exposure to alcohol and other substances. The early developer may turn to alcohol initially for social reasons but realizes that it alleviates the stress associated with normal adolescent crises. On the other hand, on time and late developers are more inclined to deal with their insecurities and develop coping skills that are more productive and effective due to lack of attention, popularity, and/or adult expectations (Ge et al., 2001). To summarize, early development was linked to alcohol use in preadolescent and adolescent males possibly due to increased social demands and psychological distress associated with an immature mind in a mature body.

Strengths

The primary strength of this study is that it was one of the first to examine personality, onset of puberty, and risky behaviors in preadolescent and adolescent males due to the growing evidence that this population is using alcohol at younger ages. Furthermore, this
research offers a contribution to an increased understanding of predictors of alcohol use on a combination of factors that have not yet been extensively studied. Another strength includes the attempt to use objective measures to identify potential risk factors to preadolescent and adolescent alcohol use as evident by responses to questions regarding participation in underaged drinking and intoxication in preadolescent and adolescent males.

Limitations

The results of this study were significantly affected by its limitations. The most significant limitation was the lack of endorsement of underaged alcohol use. The lack of representation of individuals who used alcohol made it difficult to assess for underaged drinking and intoxication. The lack of endorsement could have been influenced by a number of factors including the age range, geographic location, and social economic status of the participants. The young ages of the participants may have influenced exposure to situations that would warrant alcohol use whereas older participants may have had greater access to alcohol. Furthermore, it is important to understand the geographic location when considering the results of this study. The research was conducted in a conservative town located in the mid-western part of the United States. The conservative attitude tends to be less tolerant of alcohol use therefore possibly influencing participants' beliefs towards underaged drinking and getting drunk. Another factor to consider is the participants' possible concern about who would read their answers. The participants may have been concerned with who would view their answers causing them to respond in a favorable manner.
The second limitation is the issue of generalizability. The majority of participants came from Caucasian, married, college educated, middle- to upper-middle class families. The homogenous nature of the sample decreases generalizability making it unclear whether the results could be generalized to individuals in a less conservative or more metropolitan location.

The third limitation was the extensive use of self-report measures. These measures are more useful when combined with other forms of measurement because they often render responses that are influenced by personal biases which may lead to socially acceptable answers and/or denial of behaviors.

The fourth limitation involved the use of a personality measure that is not specific to the adolescent population. The NEO-FFI is a useful tool in gathering information about personality from adults and college-aged individuals. Although, research demonstrates that an alternative form of the NEO-FFI is adequate (Markey et al., 2002) for collecting data on adolescents, other assessment instruments may be more appropriate for collecting data on adolescent personality factors.

The fifth limitation of this study is that it examined only two possible factors (personality and development) from the numerous possibilities that could act as predictors to alcohol use in preadolescent and adolescent males.

Future Research

Further research needs to be conducted to obtain more information about specific variables that account for variance in alcohol use in preadolescent and adolescent males. Due to concerns of generalizability in the current research, future studies would benefit from having a larger, more diverse sample. Specifically, using participants from an older
adolescent population (9th and 10th grades) may be useful because of the increased exposure to situations that allows for alcohol use. Also, selecting a sample from various geographic locations, ethnicities, SES, inclusion of females, and inclusion of individuals who have been clinically documented as having problems with using/abusing alcohol would have would increase generalizability. Future researchers should recognize that using a more age-appropriate measure may be more useful for understanding personality characteristics of individuals in the preadolescent to adolescent range of development. Age-appropriate instruments are more attuned to adolescent concerns and behaviors which would increase the likelihood of obtaining a true estimate of personality. Future research needs to examine and compare male and female behaviors. Furthermore, with the increased availability of other dangerous substances it may be that adolescents are using other means to alter their minds than alcohol. Additionally, other studies may want to examine additional variables such as parental alcohol use, parental style, and socialization in the public school system, peer influence, and/or psychological distress. Understanding and considering these limitations and suggestions would be beneficial when selecting participants and predictor variables as indicators of alcohol use in future studies.
References


*Lifetime Version (version 1.0).* Pittsburgh, PA: Dept of Psychiatry, University of Pittsburgh School of Medicine.


Appendix A

Demographics Questionnaire
Demographics Questionnaire
Participant Number: ________

Please answer each question to the best of your knowledge.

1. How old is your son? ________
2. What is your son’s current grade level? ________
3. What type of grades does your son make? ________
4. At what age did your son begin puberty? ________

5. Is your son involved in extracurricular activities? If yes, please list the activities.
   a. No
   b. Yes - ________________________________

6. Does your son have any learning or developmental disabilities? If yes, please explain.
   a. No
   b. Yes - ________________________________

7. Please describe your relationship with your son (please use the back if necessary):
   ________________________________

8. What is your relationship to the participant?
   a. Mother
   b. Father
   c. Legal Guardian – Grandparent
   d. Legal Guardian – Other
9. What is your current marital status?
   a. Married
   b. Divorced
   c. Widowed
   d. Single
   e. Step Parent

10. Describe your employment status:
    a. Unemployed
    b. Self-Employed
    c. Stay at Home Parent
    d. Retired
    e. Employed
       Occupation: ____________________

11. Please describe your significant other’s employment status:
    a. Unemployed
    b. Self-Employed
    c. Stay at Home Parent
    d. Retired
    e. Not Applicable
    f. Employed
       Occupation: ____________________

12. What is the highest level of education you have completed?
    a. High School
    b. Some College
    c. Associates Degree
    d. College Graduate
    e. Master’s Degree
    f. Ph.D./ Post Doctorate

13. What is the highest level of education your significant other has completed?
    a. High School
    b. Some College
    c. Associates Degree
    d. College Graduate
    e. Master’s Degree
    f. Ph.D./ Post Doctorate
    g. Not Applicable

14. What is your household income?
    a. Under $25,000
    b. $25,000-$35,000
    c. $35,000-$50,000
    d. $50,000-$85,000
    e. Over $85,000

15. What is your race?
    a. Asian
    b. Black/African Decent
    c. East Indian
    d. Latino/Hispanic
    e. Middle Eastern
    f. Native American
    g. Pacific Islander
    h. White/Caucasian
    i. Other

16. How often do you drink alcohol?
    a. Never
    b. Socially
    c. Regularly

17. How often do you use tobacco?
    a. Never
    b. Socially
    c. Regularly
Appendix B

Adolescent Risk-Taking Questionnaire
RISK BEHAVIOR QUESTIONNAIRE

Code Number: ........................................

DIRECTIONS

Below is written a list of behaviors which some people engage in. Read each one carefully and mark the box in front of the word that best describes your behavior.

There are no right or wrong answers.

Remember, mark the box that best describes your behavior about each question in the list.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Smoking</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>2. Roller blading</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>3. Drinking and driving</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>4. Parachuting</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>5. Speeding</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>6. Stealing cars and going for joy rides</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>7. Taekwondo fighting</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>8. Underage drinking</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>9. Staying out late</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>10. Driving without a license</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>11. Talking to strangers</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>12. Flying in a plane</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>13. Cheating</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>14. Getting drunk</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>15. Sniffing gas or glue</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>16. Having unprotected sex</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>17. Leaving school</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>18. Teasing and picking on people</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>19. Snow skiing</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>20. Taking drugs</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>21. Overeating</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
<tr>
<td>22. Entering a competition</td>
<td>Never Done</td>
<td>Hardly Ever Done</td>
<td>Done Sometimes</td>
<td>Done Often</td>
<td>Done Very Often</td>
</tr>
</tbody>
</table>
RISK BELIEFS QUESTIONNAIRE

Code Number: ..........................

DIRECTIONS

Below is written a list of behaviors which some people engage in. Read each one carefully and mark the box in front of the word that best describes your opinion about how risky you think each situation or behavior is.

There are no right or wrong answers.

Remember, mark the box that best describes how risky you think each situation or behavior is.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Extremely Risky</th>
<th>Very Risky</th>
<th>Risky</th>
<th>Not Very Risky</th>
<th>Not at all Risky</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Roller blading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Drinking and driving</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4.</td>
<td>Parachuting</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.</td>
<td>Speeding</td>
<td></td>
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</tr>
<tr>
<td>6.</td>
<td>Stealing cars and going for joy rides</td>
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</tr>
<tr>
<td>7.</td>
<td>Tao Kwon Do fighting</td>
<td></td>
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</tr>
<tr>
<td>8.</td>
<td>Underage drinking</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>9.</td>
<td>Staying out late</td>
<td></td>
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</tr>
<tr>
<td>10.</td>
<td>Driving without a licence</td>
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</tr>
<tr>
<td>11.</td>
<td>Talking to strangers</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12.</td>
<td>Flying in a plane</td>
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</tr>
<tr>
<td>13.</td>
<td>Cheating</td>
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</tr>
<tr>
<td>14.</td>
<td>Getting drunk</td>
<td></td>
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</tr>
<tr>
<td>15.</td>
<td>Sniffing gas or glue</td>
<td></td>
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<tr>
<td>16.</td>
<td>Having unprotected sex</td>
<td></td>
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</tr>
<tr>
<td>17.</td>
<td>Leaving school</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>18.</td>
<td>Teasing and picking on people</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>19.</td>
<td>Snow skiing</td>
<td></td>
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</tr>
<tr>
<td>20.</td>
<td>Taking drugs</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>21.</td>
<td>Overeating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Entering a competition</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
Appendix C

NEO-FFI Modified for Preadolescents
Identification Number: __________
Age: ___

1. I am not a worrier.
2. I like to have a lot of people around me.
3. I don't like to waste or spend much time daydreaming, or thinking or dreaming about things during the day.
4. I try to be courteous or polite to everyone I meet.
5. I try to keep my belongings and things clean and neat.
6. I often feel inferior or not as good as/less important than others.
7. I laugh easily.
8. Once I find the right way to do something, I stick to it.
9. I often get into argument with my family and classmates.
10. I'm pretty good about pacing myself or giving myself enough time (taking the right amount of time) so as to get things done on time.
11. When I am under a great deal of stress, sometimes I feel like I'm going to pieces or I'm going to fall apart.
12. I don't consider myself especially "light hearted" or easy going, relaxed.
13. I am interested in art and nature.
14. Some people feel that I only care about myself or spend a lot of time thinking about myself.
15. I am not a methodical or planful, orderly person.
16. I hardly ever feel lonely or blue.
17. I really enjoy talking to people.
18. I believe letting children hear controversial speakers with whom many people disagree can only confuse and mislead them.
19. I would rather cooperate or work together with others than compete with them.
20. I try to perform all assignments conscientiously or carefully; mindfully.
21. I often feel nervous, shaky.
22. I like to be where the action is.
23. Poetry doesn't do much for me.
24. I think other people have bad intentions, I don't trust people.
25. I have a clear set of goals or things I want to do, and I work toward them in a certain order.
26. Sometimes I feel completely worthless or of no use or value.
27. I usually prefer to do things alone.
28. I often try new and foreign foods.
29. I believe that most people will take advantage of you, or use you for their benefit, if you let them.
30. I spend too much time before settling down to work.
31. I hardly ever feel fearful or anxious or afraid.
32. I often feel as if I'm bursting with energy.
33. I don't often notice the moods or feelings that different environments produce; in other words, I don't often notice the moods or feelings different places have or notice feeling different in different places.
34. Most people I know like me.
35. I work hard to finish the things I want to do.
36. I often get angry at the way people treat me.
37. I am a cheerful, high spirited or happy person.
38. I believe we should look to our religious leaders for decisions on moral issues or to help us with problems about what is right or wrong.
39. Some people think of me as cold and calculating or unemotional and sneaky.
40. When I say I’ll do something, I do it.
41. Too often, when things go wrong, I get discouraged and feel like giving up.
42. I am not a happy person who is hopeful about the future.
43. Sometimes when I am reading poetry or looking at a work of art, I get excited.
44. I’m hard-headed and tough-minded or stubborn in my attitudes; in other words, I don’t change my mind easily.
45. Sometimes I am not as dependable or trustworthy as I should be.
46. I am not often sad or depressed.
47. My life is fast-paced or busy; in my life, a lot happens all the time.
48. I have little interest in speculating on the nature of the universe or human condition; in other words, I am not really interested in trying to figure out the meaning of things or people.
49. I generally try to be thoughtful and considerate and kind.
50. I am a productive or hardworking person who always gets the job done.
51. I often feel powerless and want someone else to solve my problems.
52. I am a very active person.
53. I am curious about learning.
54. If I don’t like people, I let them know it.
55. I never seem to be able to get my things in an orderly, neat way.
56. At times I have been ashamed or feel so bad about myself that I just want to hide.
57. I would rather go my own way than be the leader of others.
58. I often enjoy playing with ideas and guesses about the meaning of things and I enjoy trying to figure out things.
59. If necessary, I am willing to trick or use people to get what I want.
60. I strive for excellence in everything that I do.
Appendix D

Self-Rating Scale for Pubertal Development
Rating Scale for Pubertal Development
Participant Number: ________

Please answer each question to the best of your knowledge.

1. Would you say that your growth in height:
   a. has not yet begun to spurt
   b. has barely started
   c. is definitely underway
   d. seems completed
   e. I don’t know

2. And how about the growth of your body hair?
   a. has not yet begun to grow
   b. has barely started to grow
   c. is definitely underway
   d. seems completed
   e. I don’t know

3. Have you noticed any skin changes, especially pimples?
   a. skin has not yet started changing
   b. skin has barely started changing
   c. skin changes are definitely underway
   d. skin changes seem complete
   e. I don’t know

4. Have you noticed a deepening of your voice?
   a. voice has not yet started changing
   b. voice has barely started changing
   c. voice changes are definitely underway
   d. voice changes seem complete
   e. I don’t know

5. Have you begun to grow hair on your face?
   a. facial hair has not yet started growing
   b. facial hair has barely started growing
   c. facial hair has definitely started
   d. facial hair growth seems complete
   e. I don’t know

TOTAL: ________
Appendix E

Bowling Green Board of Education Approval Letter
Ms. Sarah Wickman
1609 Media Drive
Bowling Green, Kentucky 42101

Dear Ms. Wickman:

The Bowling Green Board of Education approved your request on Monday evening, February 14, 2005, to conduct a study of adolescents on the impact of puberty and alcohol usage.

Please contact me if I may be of further assistance.

Sincerely,

John C. Settle, Ed.D.
Superintendent

JCS:rc
Appendix F

Human Subjects Review Board Approval
Sarah Wickman
1609 Media Dr.
Bowling Green, KY 42101

Dear Sarah:

Your revision to your research project, “An Examination of the ‘Big Five’ Personality Factors, Pubertal onset, and Alcohol Usage in Adolescent Males,” was reviewed by the HSRB and it has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects’ welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that you need to orient participants as follows: (1) signed parental informed consent and signed assent is required; (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data. (3) Appropriate safeguards are included to protect the rights and welfare of the subjects.

This project is therefore approved at the Full Board Review Level until August 1, 2005.

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Sponsored Programs at the above address. Please report any changes to this approved protocol to this office. Also, please use the stamped Informed Consent documents that are included with this letter. A Continuing Review protocol will be sent to you in the future to determine the status of the project.

Sincerely,

Sean Rubino, M.P.A.
Compliance Manager
Office of Sponsored Programs
Western Kentucky University

cc: HS file number Wickman HS05-148
cc: Dr. Melissa Hakman
Appendix G

Informed Consent
You are being asked to allow you and your son to participate in a project conducted through Western Kentucky University. The University requires that you give your signed agreement to participate in this project.

In the attached letter, you and your son were provided with an explanation of the purpose of the project, what you both will have to do, and the potential benefits/risks of participation. During participation, if you or your son should have any questions about the project, you may contact us using the contact information which you were provided. A basic explanation of the project is written below. Please read this explanation and contact the researcher with any questions you may have.

A. Purpose: This study will look at how personal characteristics of teenagers and changes in their bodies affect the things which they do.

B. Procedures: This study will involve completion of forms. Specifically,

1. You as a parent will complete one form that will ask for basic information about your family such as income, occupation, education level, etc. After signing this consent form, you will complete your form and return it to the homeroom teacher in the enclosed envelope.

2. Your son will complete three forms. One will ask questions about characteristics of your son. The second will ask questions about physical changes common during the teenage years. The third will provide information on what types of activities you son does. These will be completed by your son with the researcher during school time within the next couple of weeks.

C. Duration of Participation: You and your son’s participation are completely voluntary and may be ended at any point without penalty or prejudice. This study is designed to last approximately 15-30 minutes.

D. Confidentiality: All information about you and your son will be kept confidential and will not be released. Forms will have numbers, rather than names on them. All information will be kept in a secure place that is open only to the researchers and their assistants. This information will be saved as long as it is useful; typically such information is kept for five years after publication of the results. Results from this study may be presented at professional meetings or in publications. You or your son will not be identified individually; we will be looking at the group as a whole.

E. Benefits: For participating in this study, your son will be given a gift card from Blockbuster Video for one free new release video or game rental after he completes the forms. In addition, your name will be entered into a lottery for a $20.00 gift certificate to a local business. If you are interested, we will send you a copy of the result of the study when it is finished.
F. Discomfort and Risks: The risks for the study are minimal. The forms have been used in previous studies with no harmful effects. If, in filling out the forms, you and/or your son have concerns, a list of several names and phone numbers of agencies that provide psychological services will be provided. You and/or your child may withdraw at anytime without prejudice or consequence.

I have been fully informed about what is expected of me and my son in this study. I am aware of what my son and I will be asked to do and the benefits of our participation. I also understand that it is not possible to know all potential risks in a study, and I believe that reasonable safeguards have been taken to reduce both the known and unknown risks to me and my son. I also understand/agree with the following statements (Please check to note that you agree):

- I affirm that I am 18 year of age or older.
- I agree to complete the demographics questionnaire at home and return it to my son’s homeroom teacher.
- I agree to allow my child, ________________________________, to complete the following questionnaires: NEO Five Factor Inventory, the Self-Rating Scale for Pubertal Development, and the Adolescent Risk Taking Questionnaire at school with the researcher.

I understand that I may contact the researcher at the following address and phone number, should I desire to discuss my participation in the study. Melissa Hakman, Ph.D., 256 Tate Page Hall, Department of Psychology, Western Kentucky University, Bowling Green, KY 42101, (270)745-5435. I may also contact Dr. Phillip E. Meyers, Human Protection Administrator at (270) 745-4652. I have read and fully understand this consent form. I sign it freely and voluntarily. A copy of this form will be given to me. I hereby give permission for my son and myself, to participate in this study.

__________________________________________  ______________________
Signature of Parent/Legal Guardian             Date

__________________________________________  ______________________
Witness                                      Date

THE DATED APPROVAL ON THIS FORMS INDICATED THAT THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY THE WESTERN KENTUCKY UNIVERSITY HUMAN SUBJECTS REVIEW BOARD.
Dr. Phillip E. Myers, Human Protection Administrator
TELEPHONE: (270) 745-4652