THE IMPACT OF GENDER ROLE IDEOLOGY, GENDER ROLE IDENTITY, REFLECTIVE NORMS, AND THE MEDIATIONAL EFFECTS OF DRINKING MOTIVES ON FEMALE COLLEGE STUDENT ALCOHOL CONSUMPTION

By

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Abstract

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Heavy drinking causes many problems for female college students including academic deficiency, social issues, and an increased risk for sexual assault. This study aimed to create a model of female college student drinking in order to determine the cause of the increase in female university student drinking over the past 25 years. A path analysis was run to examine this model and found masculinity, femininity, reflective norms, drinking for coping motives, and drinking for conformity motives to significantly predict alcohol use among college females. Significant indirect effects were also discovered from sex-role egalitarianism to alcohol use through coping motives and conformity motives and from reflective norms to alcohol use through coping motives. These results further expand the knowledge base on female college student alcohol use and may be used to direct further research and create more comprehensive models of alcohol use.
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Introduction

Alcohol consumption during the college years has long been considered tradition. For example, a number of national studies report college students have been drinking more than their non-collegiate peers for many years and continue to drink more today (Centers for Disease Control, 1997; Johnston, O’Malley, Bachman, & Shulenberg, 2011). The vast majority (80%) of students attending a university drink some amount of alcohol, and a very large percentage (40%) engage in heavy drinking (O’Malley & Johnston, 2002; Weschler, Lee, Kuo, Seibring, Nelson, & Lee, 2002; ). The current definition of binge drinking is five drinks in a row for men and four drinks in a row for women (Weschler, Dowdall, Davenport, & Rimm, 1995; Weschler & Nelson, 2001). This definition is considered to be a better indicator of binge drinking than the previous measure (five drinks in a row for both genders) because the effects of alcohol are felt more quickly and with the consumption of fewer alcoholic beverages for women (Jones & Jones, 1977).

Negative Consequences of Heavy Drinking

Heavy drinking has numerous negative consequences for individuals who engage in high levels of alcohol consumption. Data collected from the Harvard School of Public Health Alcohol Study indicates that students who frequently drink large amounts of alcohol were much more likely to report academic problems such as missing a class and getting behind in school work (Weschler & Nelson, 2001). In fact, in a survey of 66 college campuses across the United States, number of drinks per week was found to be
strongly related to grades, with those who received A’s drinking a little more than three
drinks per week, students with B’s consuming almost five drinks per week, students with
C’s drinking just over six drinks per week, and those students who reported receiving D’s
and F’s drinking about nine drinks per week (Presley, Meilman, Cashi, & Lyerla, 1996)
These frequent heavy drinkers were also more likely to report negative health
consequences such as having unprotected sex, getting hurt or injured, and experiencing
an alcohol overdose requiring medical treatment, as well as making poor decisions that
lead to getting in trouble with the police, damaging property, and driving under the

Not only do the individuals engaging in binge drinking see negative
consequences, those in the surrounding community experience “secondhand effects” of
college campuses with a high level of binge drinking. These secondhand effects include
being assaulted (physically or sexually), having their property damaged, interruptions of
sleep or studying, and having to take care of drunk students (Wechsler et al., 2002). For
example, in 2001 over 500,000 students in the United States were unintentionally injured
by their own drinking, another 600,000 students were hit or assaulted by an intoxicated
student, and over 1,700 students died from unintentional alcohol related events. It is no
surprise that understanding the reasons for excessive college student drinking and the best
methods for reducing it, are of utmost concern to university health, law enforcement, and
administrative organizations (Hingson, Heeren, Winter, & Wechsler, 2005).

A study of the correlates of binge drinking conducted by Weschler and colleagues
(1995) found that college binge drinkers were likely to be male, Caucasian, living in a
fraternity, majoring in business, have parents who are college educated, have engaged in binge drinking their senior year of high school, and view parties as important. An interesting factor that is not in itself correlated to the likelihood of binge drinking is being over the legal drinking age of twenty-one. This finding indicates that laws and legal measures used to deter underage drinking are having little to no effect (Weschler, Dowdall, Davenport, & Castillo, 1994). Research on the effects of punitive legislation and its deterrent effect on driving while intoxicated has shown these laws have no discernible effect on the number of individuals who report drinking and driving, giving support to the assumption that punitive laws have little to no deterrent effect on underage drinking and driving as well (Evans, Neville, & Graham, 1991). A study by the National Center on Addiction and Substance Abuse at Columbia University indicates that alcohol related arrests constituted 83% of all campus arrests in 2005, and with the lack of any noticeable lessening of overall binge drinking, these results further support this assumption (CASA, 2007).

With this failure for current laws and programs to make any discernible progress at reducing the heavy college drinking and its negative consequences on both the student involved and their peers and surrounding community members, it is even more important for researchers and policy makers to gain a better understanding of the correlates of problem drinking in order to create more effective interventions to combat it.
Female College Student Drinking

Excessive college drinking has traditionally been thought of as primarily a male issue and a few decades ago this may have been the case. Many studies done in the past show a large difference in the frequency and quantity of alcohol consumption between male and female college students, as well as a large discrepancy between the number of male and female students who engaged in heavy episodic drinking (e.g. Straus & Bacon, 1953). A 1987 study had students take a breathalyzer test after leaving university area drinking establishments and found a large difference between the average blood alcohol level (BAL) reached by male (BAL=.077%) and female patrons (BAL=.040%; Meier, Brigham, & Handel, 1987).

Recent data suggests, however, that this difference in the patterns of drinking for male and female college students is decreasing and in some cases has become nonexistent (Grucza, Norberd, & Beirut, 2009; Lange & Vaos, 2001, Substance Abuse and Mental Health Services Administration, 2008; Mercer & Khavari, 1990). In 2000, the Monitoring the Future Study, found a convergence of the number of college students drinking, with 67% of men and 68% of women reporting having consumed alcohol in the last thirty days (Johnston, O’Malley, & Bachman, 2001). The discrepancy between heavy episodic drinking for men and women has been decreasing as well, with the prevalence being 24% higher for men in 1986 and only 16% higher for men in 1997 (O’Malley & Johnston, 2002). A replication of the 1987 study by Meier, Brigham, and Handel, also found a sizable decrease between the average BAL of male and female individuals leaving a university area bar. After twenty-five years male patrons had increased their average
BAL to .095%, and female patrons had increased their intoxication levels to almost parallel their male counterparts with an average BAL of .092% (Onorati, Palmer, Eisenhower, Sacchi, & Brigham). This equalization of drinking levels for male and female college students has also been seen in European countries such as the United Kingdom, Sweden, and the Netherlands for both an equalization of general drinking prevalence and prevalence of heavy episodic drinking (e.g. Engs & Van Teijlingen, 1997; Bewick, Mulhern, Barkham, Trusler, Hill, & Stiles, 2008; Johnsson & Berglund, 2006; Plasschaert, Hoogstraten, Van Emmerik, Webster, & Clayton, 2001).

This increase in female drinking is especially concerning because of the biological differences between men and women and their ability to metabolize alcohol. Women tend to have more body fat, lower levels of alcohol dehydrogenase, and fluctuating hormonal cycles, all of which may cause women to have higher BALs than men after consuming the same or smaller amounts of alcohol with body size held constant (Jones & Jones, 1977). Not only do women tend to become intoxicated more quickly, women who drink alcohol more frequently and those who consume more in a single occasion are more likely to be sexually assaulted (Ullman, Karabatsos, & Koss, 1999). College women who reported frequent drinking were found to be up to nine times more likely to be sexually assaulted than their female classmates who do not consume alcohol regularly (Parks & Fals-Stewart, 2004). These increased risk factors make understanding the reasons for the increase in female college student drinking so that effective interventions can be implemented that much more important.
Drinking Motives

With so many college students consuming alcohol regularly and high numbers engaging in heavy episodic drinking, it is imperative to understand the reasons students are drinking. In order to effectively create programs to reduce risky drinking behaviors, it is necessary to understand which precursors to drinking behavior are responsible for the negative consequences often seen with heavy episodic drinking. Research on the motives for drinking aims to understand the specific motivations for college students, and how these motives influence their drinking behaviors and drinking related consequences.

Research on drinking motives suggests that individuals drink in order to attain a specific outcome. Essentially, individuals have been reinforced for past drinking behaviors with a specific reinforcer and this reward is what motivates them to drink again in the future. Although many different models of drinking motives have been studied (Cox, & Klinger, 1988; Cooper, Russel, Skinner, & Windle 1992; Grant, Stewart, O'Connor, Blackwell, & Conrod, 2007), this review will focus on a four-factor model (Cooper, 1994). Four specific drinking motives have been identified that motivate individuals to drink, two of which are considered positively reinforcing and two of which are considered negatively reinforcing. The first two motives which involve positive reinforcement are social and enhancement motives which differ in whether the reward is internal, as in the case of enhancement motivations (e.g. increasing positive feelings/emotional states) or external, as in the case of social motivations (e.g. to obtain social benefits). The last two motives which involve negative reinforcement also differ in whether they involve internal states, as in the case of coping motives (e.g. to reduce
negative feelings/emotional states) or if the reinforcement is external, as in the case of conformity motives (e.g. to avoid social rejection).

Drinking for coping reasons has been found to be related to many negative consequences. These drinkers are more likely to drink alone, drink heavily, experience problems associated with alcohol abuse, and were more likely to have experienced drinking related problems (Cutter & O'Farrel, 1984; Snow & Wells-Parker, 1986; Cooper, Russell, & George, 1988). Specifically, those who report drinking to escape from problems and to lessen or avoid negative emotions engaged in more risky behaviors (Cooper, Frone, Russell, & Mudar, 2000; Martens, Cox, & Beck, 2003; Merrill & Read, 2010), had more academic/occupational problems (Bradley, Carman & Petree, 1991; Cooper, Russell, Skinner, & Windle, 1992; Merrill & Read, 2010; Windle & Windle, 1996), and showed higher levels of psychological dependence to alcohol (Carpenter & Hasin, 1998a; Carpenter & Hasin, 1998b; Carpenter & Hasin, 1999; Cooper, Russell, Skinner, & Windle, 1992; Kassel, Jackson, & Unrod, 2000). These negative consequences along with the fact that drinking for coping reasons is often thought of as abnormal, inappropriate, and pathological may lead to a circular pattern of using negative coping skills leading to more problems which then again leads to more drinking and more use of these negative coping skills (Smith, Abbey, & Scott, 1993; Cooper, Russell, & George, 1998).

In contrast to the negative views society has on drinking to cope with negative emotions, drinking for social motivations is considered normal and even customary, especially for college students (Smith, Abbey, & Scott, 1993). This motivation for
drinking then should not be related to poor social skills, coping mechanisms, nor to problem drinking behaviors (Cooper, Russell, & George, 1988), and as expected adults whose drinking is socially motivated tend to drink less frequently, drink less during each drinking occasion, and tend to engage in less problematic drinking (e.g. Cutter & O'Farrell, 1984; Cooper, Russell, Skinner, & Windle, 1992;). Although overall associations are seen between these less problematic drinking behaviors and social motivations for drinking, research shows that college students are most likely to report drinking for social reasons (Stewart, Zeitlin, & Samoluk, 1996) and in the case of college students social motivations are related to heavier and more frequent drinking but fewer alcohol related problems (Cooper, 1994). College students are more likely than many other groups to engage in problematic drinking behaviors (Johnston, O’Malley, Bachman, & Shulenberg, 2011) and more research is needed to understand what may mediate the relationship between the social motivations for drinking and heavy drinking for college students.

Both enhancement and conformity motives have been shown to be associated with heavy drinking, though there has been much less research focused on these motivations. Specifically, drinking for enhancement motives has been shown to be related to patterns of heavy alcohol use and increased likelihood to drink in situations conducive to heavy drinking. Along with coping motives, drinking for enhancement reasons has also been shown to be associated with alcohol related problems, although unlike coping motives, this has been shown to only be an indirect association mediated by alcohol use (Cooper, Russell, Skinner, & Windle, 1992; McCarty & Kaye, 1984).
Conformity motives, on the other hand, have been found to be negatively associated with drinking frequency, amount, and heavy drinking. These motives were, however, associated with an increased likelihood to experience drinking related problems compared to those drinking equal amounts who report drinking for social or enhancement motives (Cooper, 1994).

**Reflective Norms**

Alcohol use among college students has been shown to be highly linked with the perceived normative behaviors of others (Borsari & Carey, 2003; Perkins, 2002; Neighbors, LaBrie, Hummer, Lewis, Lee, Desai, Kilmer, & Larimer, 2010; Labrie, Hummer, Neighbors, & Larimer, 2010). Descriptive norms refer to how much individuals in a certain group actually drink, and injunctive norms refer to beliefs as to how much an individual within the group should drink. Both of these forms of norms have been shown to predict alcohol consumption among college students and have been shown to be stronger correlates of drinking behavior than other widely studied factors such as age, class standing, sorority/fraternity membership, and drinking motives (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Perkins, Haines, & Rice, 2005).

The association between drinking behavior and perceived norms, while an important connection for both sexes, may be especially important when examining female drinking behavior. Women have been shown to be more likely than men to overestimate peer acceptance of alcohol use as well as display greater self-other discrepancies for descriptive and injunctive norms. For descriptive norms this means
women show larger differences between what they drink and what they believe their peers drink than men. With injunctive norms, they show larger differences than men in how much they believe they should drink and how much others in their peer group should drink. (Berkowitz & Perkins, 1987; Borsari & Carey, 2003). These findings suggest that women tend to have more misperceptions about the drinking behavior of others within their peer group. Although this may not be directly problematic for women, it has been suggested that women may be more likely than men to yield to persuasive forces in group settings because women are socialized to be more concerned with the social aspects of group interaction (Eagly, 1978). During the college years alcohol is an integral part of the social process for many if not most college students, and because women may be more concerned with group harmony and cohesion than men, they may be more sensitive to perceived descriptive and injunctive norms (Gilligan, 1982).

While both descriptive and injunctive norms are related to college drinking behavior, more recent research has discovered another correlate to student alcohol consumption known as reflective norms. Reflective norms refer to the perceived preferences of the opposite-sex on alcohol use. That is, how much alcohol an individual believes members of the opposite sex would like them to drink (LaBrie, Cail, Hummer, Lac, & Neighbors, 2009). These norms may be a reason we have seen an increase in women's drinking over the past few decades. Young et al. (2005) used group discussions with female college binge drinkers to investigate the reasons for their risky drinking behaviors and found a common theme. Many women reported believing that men found women who could "drink like them" more attractive than women who could not drink as
much. This idea was often brought up as a reason for binge drinking and many reported feeling pressured to drink more in order to impress their male peers. Specifically, many women from the study believed that men found it attractive and paid more attention to them when they could match them drink for drink. Results of a study conducted by LaBrie and colleagues (2009) support this interpretation. Specifically they found that women often believed men wanted them to drink more than the men in the study actually reported wanting women to drink and this perception was associated with women's drinking behavior. Changes in what is thought to be acceptable and desirable drinking behavior for women could play an important role in the number of women who decide to drink and the number of drinks these women imbibe on any drinking occasion. This process, along with the fact that women may be more susceptible to changing their behaviors in order to fit in with what they believe are normative behaviors for their gender, suggests a great need for researchers to better understand this motivation for drinking.

**Gender Role Identity**

Another possible reason for the convergence of male and female drinking behavior is the reduction of differences in gender identity and gender ideology that has been seen over the last few decades (Astin, Green, & Korn, 1987; Perkins, 1992). Theory suggests that as male and female gender roles become more similar we will see a transformation of attitudes in a number of different domains, including what is gender appropriate social behavior (Bell, Haveliciek, & Rodnick, 1984; Wilsnack & Wilsnack, 2009).
Traditionally, heavy drinking has been considered “unladylike”, so while it is socially acceptable for men to drink and get drunk, it has been less acceptable for women to drink, and especially unacceptable for women to drink in excess (Landrine, Bardwell, & Dean, 1988; Lemle & Mishkind, 1989). Thus, according to the convergence hypothesis, as women begin to act more like men, women will begin to drink more frequently and consume more alcohol per drinking occasion (Temple, 1987; Wilsnack, Wilsnack, & Klassen, 1984).

Gender identity refers to the manner in which individuals internalize traditional gender roles into their sense of self (Bem, 1974). Traditional masculine traits include independence, aggression, and dominance and may be classified as instrumental traits (Connell, 1995; Rosenfield, 1999). Traditional feminine traits include nurturance, compassion, and other traits related to developing and maintaining interpersonal relationships and are also known as expressive traits (Spence, 1984; Umberson, Chen, House, Hopkins, & Slaten, 1996). Instrumental and expressive traits then allow individuals to fit into 4 possible categories based on their gender identity. Those who score highly on the masculine traits and low on feminine traits would be considered masculine and those who score highly on the feminine traits and low on masculine traits would be considered feminine. The final two categories are androgynous, who score highly on both masculine and feminine traits, and undifferentiated, people who score low on both the masculine and feminine scales (Bem, 1974).

Studies on gender identity and the convergence hypothesis have aimed to show that women who hold more masculine traits will engage in more male oriented behaviors.
Offering support to this prediction, Shifren & Bauserman (1996) found that individuals who were androgynous or feminine tended to drink less than those who were masculine or undifferentiated. This, however, may support the idea that femininity is a protective factor against heavy drinking, not necessarily that masculinity increases alcohol consumption. Other research, however, does support the belief that masculine traits are related to increased alcohol use. Specifically, researchers have found connections between high levels of masculinity and higher levels of alcohol consumption and alcohol abuse. However, evidence that this connection exists for both men and women with high levels of masculinity is inconclusive (Chomak & Collins, 1987; Mosher & Sirkin, 1984; Snell, Belk, & Hawkins, 1987). Researchers have also found a negative relationship between high levels of femininity and alcohol use. Specifically, those with highly feminine traits tend to drink less frequently and consume less when they do drink (Huselid & Cooper, 1992; Ricciardelli & Williams, 1995; Snell, Belk, & Hawkins, 1987). Femininity has also been found to predict fewer drinking problems in adolescence and be inversely related to alcohol consumption in college students (Horowitz & White, 1987; Huselid & Cooper, 1992; Wilsnack & Wilsnack, 1978; Chomak & Collins, 1987).

**Gender Role Ideology**

A second factor that could offer a reason behind the reduced gap between male and female college student drinking is gender role ideology. Over the past 60 years women have begun to dress like men, work in typically male professions, and receive undergraduate and graduate degrees in numbers even greater than men (US Census
Bureau, 2011). Many researchers believe these large changes in what both men and women believe are appropriate gender role behaviors may be influencing the change in female drinking behavior (Wilsnack, Vogeeltanz, Wilsnack, & Harris, 2000). It would not be surprising to find that women are not only acting more like men in their educational, domestic, and professional lives and aspirations, but that women have also picked up some of the more harmful behaviors that have typically been related to being male such as heavy alcohol use (Hammer & Vaglum, 1989; Mercer & Khavari, 1990; Saelen, Moller, & Koster, 1992).

Much of the research looking at the association between gender role ideology and alcohol use has supported the conventionality model which suggests that traditional gender role attitudes are negatively related to alcohol use for women and positively related to alcohol use for men. A number of studies have supported the conventionality model, finding that women with more non-traditional or egalitarian gender role attitudes tend to drink more frequently and in higher quantities than women with a more traditional gender role ideology (Huselid & Cooper, 1992; Zucker, Battistich, & Langer, 1981; Parker & Harford, 1992) This association has been shown to span at least from late adolescence well into middle adulthood (Murphy, Connelly, Evens, & Stoep, 2000). It has also been found that women who are employed outside the home (which is a traditionally masculine behavior) are more likely to drink frequently and in higher quantities (Parker & Harford, 1992; Christie-Mizell & Peralta, 2009). Although research on gender role ideology has looked at its association with alcohol use, further research is
needed to discover its connection with alcohol use in university students and specifically in female university students.

**Purpose of the Study**

Past research has shown a number of different possible causes for the increase in male and female college student drinking. The two different possibilities that will be analyzed in this study are changing norms and changing gender roles (both identity and ideology). Young and colleagues (2005) found that when they asked heavy drinking college women to discuss why they drank so much, many reported they believed that men (in this case male college students) liked women who could keep up with their drinking. This suggests that the increase in college female drinking may be due to a change in reflective norms (women believe that men want them to drink more) implying that women are drinking more due to an attraction/companionship motivation. The second possible reason for the increase in drinking behaviors is the convergence of gender roles that has occurred over the past 50 or so years. Both gender role identity (masculine and feminine traits) and gender role ideology (traditional vs non-traditional gender role attitudes) have shifted as opportunities for women in educational, professional, and domestic domains have increased. With this shift, there has been a change in both male and female attitudes toward what is appropriate behavior for women. Due to this change in attitudes, it has become more acceptable for women to act like men and more acceptable for women (especially college women) to drink like men. Although, research has supported both of these reasons for the increase in female drinking, no research has
directly compared the two in order to discern which is the more powerful predictor of female drinking. The effects of drinking motivations on alcohol use behaviors will also be measured. Finally the, as yet untested, mediational effects of drinking motives on the relationship between norms, gender role identity, gender role ideology, and drinking will be examined.

**Hypotheses**

(1) Reflective norms will predict drinking behavior

(2) Higher levels of masculine gender identity will be positively related to drinking behaviors

(3) Higher levels of feminine gender identity will be negatively related to drinking behaviors

(4) Non-traditional gender role ideology will be related to heavier drinking behaviors

(5) Coping, enhancement, and social motivations for drinking will be positively associated with alcohol consumption

(6) Conformity motivations for drinking will be negatively associated with alcohol consumption

**Methods**

The purpose of this study is to examine the factors that may be related to the increase in female college student drinking seen over the past twenty-five years. The relative predictive power of gender role identity, gender role-ideology, reflective norms,
and drinking motives will be studied in order to better understand their individual and collective influence on women’s binge drinking at the college level. The influence of drinking motives as a mediator between the exogenous variables (gender role identity, gender role-ideology, and reflective norms) and the endogenous variable (binge drinking) will also be examined (see fig. 1).

Participants

A sample of 304 undergraduate women were recruited using the Washington State University Psychology human subjects pool. The human subjects pool consists of undergraduate students enrolled in psychology courses which either require research participation or offer extra credit for students who opt to participate in research experiments. This population is a relatively representative sample of the university as a whole based on ethnicity, age, and year in school. Data was collected Spring semester, 2012. An additional 114 participants were recruited using an online survey collection site named MTurk run by Amazon.com. This site allows individuals to log on and receive minor monetary compensation for completing surveys. The individuals who participated in the current study were all women currently attending four year universities in the United States, they were paid nine cents for completing the study. The total 418 participants had an average age of 20.58 (s=3.39), thirty-four individuals (8.1%) indicated they were part of university athletics, and 100 reported being a member of a campus sorority (23.9%).
Measures

Data was collected through a survey designed by the researcher. The survey included three existing scales, the Bem Sex Role Inventory Short Form (BSRI-SF) (Bem, 1974), the Sex-Role Egalitarianism Scale Short Form (SRES-SF) (Beere, King, & King, 1984), and the Drinking Motives Questionnaire (DMQ) (Cooper, 1994). Along with these scales the survey included a basic demographics questionnaire, a set of questions related to females’ reflective perceptions of males’ opposite-sex normative drinking preferences (LaBrie, Cail, Hummer, Lac, & Neighbors, 2009), and a binge drinking questionnaire created using the AUDIT-C (Bush, Kivlahan, McDonnell, Fihn, & Bradley, 1998) and Monitoring the Future national study survey (e.g. Johnston, O’Malley, Bachman, & Schulenberg, 2011) to measure alcohol use.

The *Bem Sex Role Inventory Short Form* was designed to measure gender role identity. The short form consists of twenty items, ten expressive trait items and ten instrumental trait items. The expressive items are designed to measure traditionally feminine gender role characteristics while the instrumental items are considered traditionally masculine. Subjects are asked to rate how well each item describes themselves on a 7-point Likert scale ranging from 1 (never or almost never true) to 7 (always or almost always true). The scores from the ten expressive and ten instrumental items are then added up to form a masculine and feminine score. These scores then lead to four different gender role identities: Androgynous (high masculine, high feminine), Masculine (high masculine, low feminine), Feminine (low masculine, high feminine), or Undifferentiated (low masculine, low feminine). The BSRI-SF has been shown to have
acceptable reliability for both the instrumental and expressive subscales (α=.89, α=.82) and a factor analysis by Campbell, Gillaspy, and Thompson (1997) indicates the short form has a better overall fit than the original measure (CFI=.87).

The *Sex-Role Egalitarianism Scale Short Form* was designed to measure attitudes toward equality between men and women. The SRES-SF contains twenty-five items including those reflecting women in traditionally male roles and men in traditionally female roles. This instrument is scored on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating more egalitarian gender role views. The SRES-SF has been shown to have high reliability (α=.94) and does not correlate highly with measures of social desirability (Beere, King, & King, 1984).

The *Drinking Motives Questionnaire* is a twenty item scale designed to measure four different motivations for drinking. The Coping Motive subscale measures negatively reinforced, internally generated motives for drinking such as to reduce negative affect. The Enhancement Motives Subscale measures positively reinforced, internally generated motives for drinking such as to enhance positive affect. The Conformity motives subscale measures negatively reinforced, externally generated motives for drinking such as to avoid social rejection, and finally the Social Motives subscale measure positively reinforced, externally generated motives for drinking such as to make social gatherings more enjoyable. All of these subscales show reasonable reliability (α=.84, α=.88, α=.85, α=.85) and the four-factor model provides a good fit (CFI=.93) indicating good construct validity (Cooper, 1994).
The *reflective opposite-sex norms* questions will be taken directly from Labrie, Cail, Hummer, Lac, and Neighbors (2009). These five questions aim to measure the perceived preferences of how many drinks men want women to drink on a single occasion. These reflective norms are measured using two items regarding the typical number of drinks and maximum number of drinks a male would want his female friend to drink on a single occasion, as well as three items asking about the preferred number of drinks for his female friends, sexual partners, and dating partners. The first two items are open ended (participants can enter any whole number) while the last three items are measured on a 5 point Likert-type scale with the following response options: 0-A woman who never drinks any alcohol, 1-A woman who drinks 1 or 2 drinks when she drinks, 2-A woman who drinks 3 or 4 drinks when she drinks, 3-A woman who drinks 5 to 8 drinks when she drinks, 4-A woman who drinks 9 or more drinks when she drinks.

The *AUDIT-C* is a three item scale created from the AUDIT (Alcohol Use Disorders Identification Test) to measure hazardous drinking and alcohol abuse. The shortened three item version is scored on a 5 point Likert-type scale and the single factor has shown good measures of fit which indicates high construct validity, and has an estimated internal consistency of .84 (Broyles, Gordon, Sereika, Ryan, & Erlen, 2011). The last item of the AUDIT-C has been changed for this study to indicate how often the individual has had four or more drinks in a row on a single occasion as opposed to five or more drinks. This alteration of the measure was determined to be useful because only female drinking will be measured and the current measure of binge drinking for women is four drinks, not the typical five. Along with the AUDIT-C, one question will be added
from the Monitoring the Future National Survey to measure any recent binge drinking
that has occurred. This item will ask how often the individual has consumed four or more
drinks on a single occasion in the last two weeks.

**Procedure**

Participants logged onto either the WSU psychology subject pool website or the
MTurk website using their personal information. They then completed the survey online
at a computer of their choice. No personally identifying information was collected or sent
to the researcher to ensure anonymity. After completing the survey participants received
the appropriate course credit or monetary reward for their participation.

**Results**

**Scale Analysis**

Preliminary analyses were run to evaluate the validity and factor structure of the
measures used. The confirmatory factor analysis of the *Bem Sex Role Inventory Short-
Form* indicated acceptable fit for a two-factor model with a CFI of .834, RMSEA of .094,
and SRMR of .080. The item loadings for the instrumental (masculine) factor were all
good with item 11 (willing to take risks) having the lowest loading at .335. The
expressive (feminine) factor also had good item loadings with individual loadings
ranging from .435 to .864. The two factors were only minimally correlated at r=.123 and
the scale had good reliability with α=.85.
A confirmatory factor analysis of the *Sex-Role Egalitarianism Scale Short-Form* initially indicated the 25 items produced a poor fit for the single expected factor. An exploratory factor analysis was then run to determine the cause of the poor fit and it was determined the negatively worded items were loading on a separate factor. Although a two-factor model significantly improved the overall fit the separation of the single factor is not substantially meaningful and is assumed to be a method effect caused by different response styles to the oppositely worded questions. Other research has indicated the SRES-SF to be highly valid and reliable (King & King, 1990), thus the single factor model was used in this study. Reliability analysis from the current study indicated good reliability for the scale, with $\alpha=.90$.

The *Drinking Motives Questionnaire* indicated good overall fit for a four-factor model ($CFI = .925$, $RMSEA = .086$, $SRMR = .069$). Every item for each factor loaded very highly with the lowest factor loading being item 10 loading on the coping factor at .633. There were moderate expected correlations between the factors ranging from .404 to .677, with the exception of the correlation between the two positive reinforcement factors. Enhancement and social motivations were correlated at .909 indicating a possible problem with discriminant validity. An exploratory factor analysis was then run to examine the item loadings on these two factors. The EFA indicated very high cross-loadings between these two factors signaling that these two factors appear to be measuring the same underlying construct. Due to these results the Enhancement and Social factors will be combined into a single positive reinforcement factor for the remainder of the analysis. This scale had a very high overall reliability with $\alpha=.947$, and
each of the three factors also had high reliability (Coping: $\alpha=.911$, Conformity: $\alpha=.921$, Positive Reinforcement: $\alpha=.945$).

The three items responded to on a Likert scale from the *reflective opposite-sex norms* questions were combined into a single scale measuring reflective norms. These three items indicated good loadings on the single factor, with loadings of .653, .716, .609. These items showed moderately poor reliability with $\alpha=.70$. The *AUDIT-C* also had high loadings for each of the four items on the single factor. These loadings ranged from .566 to .948 and the scale was moderately reliable with $\alpha=.84$.

**Data Characteristics**

Means and standard deviations for each of the measures used in the model can be found in figure 1. The SRES showed a mean score of 106.18 indicating high gender-role egalitarianism for the women in the study. The Bem Sex-Role Inventory scores indicate high levels of femininity ($M=56.36$) and moderately high levels of masculinity ($M=48.41$). The Drinking Motives Questionnaire indicated low levels of drinking for both coping ($M=9.33$) and conformity motives ($M=8.82$), and much higher levels of drinking for positive reinforcement motives ($M=28.94$). It should be noted that because the Enhancement ($M=13.89$) and Social motives ($M=15.13$) were combined, the positive reinforcement motives are on a larger scale (10-50) than either of the negative reinforcement motives (5-25). The AUDIT scores indicated a moderate level of drinking ($M=4.36$), examining the original AUDIT measure (the first 3 alcohol questions in this study) a score of 3 or above for women is considered positive for problematic drinking.
and the mean for this study for only these three questions is above that threshold at M=3.77. A correlation matrix for the measures used in the model can be found in the appendix in figure 2.

In order to be sure the data collected from Washington State University and the data collected from MTurk were not significantly different as a precursor to running the model the path analysis was run with group membership as an exogenous variable. This path analysis indicated that group membership (WSU or MTurk) had no significant effect on any of the dependent variables in the study. The data from both sources were then combined for use in all further path analyses.

**Model Analysis**

Path analysis was used to examine the relationship between sex-role egalitarianism, sex-role identity, reflective norms, drinking motives and alcohol use as well as to measure the mediational role of drinking motives on the relationship between sex-role egalitarianism, sex-role identity, reflective norms, and alcohol use. Figure 3 shows the baseline model used for the first round of analysis. This model includes all pathways to form an overidentified recursive model with 3 degrees of freedom. Fit indices for the baseline model indicate acceptable fit with CFI=.947 and SRMR=.063. The RMSEA indicated a poorer fit at .112. Significant direct effects were found for alcohol use on reflective norms, masculinity, femininity, and coping motives (-.106, -.296, -.165, .401). Conformity motives and positive reinforcement motives on gender-role egalitarianism also had significant paths (-.213, -.131). Finally, significant direct effects
were found for coping motives on reflective norms, femininity, and gender-role egalitarianism (-.127, -.086, -.072). Loadings for all available paths can be seen in the appendix in figure 4.

Subsequent models were evaluated which removed each non-significant path on subsequent steps to find the most parsimonious model (see fig. 5). Once all non-significant paths were removed, in the final step a correlated error was added between positive reinforcement motives and conformity motives. This greatly improved the fit of the model. The final model indicated acceptable fit, with CFI=.951, RMSEA=.056, and SRMR=.056. This model accounted for a significant proportion of the variance in alcohol use with $r^2=.327$. It also accounted for a large proportion of the variance in conformity motives ($r^2=.401$), and smaller proportions of the variance in coping motives ($r^2=.118$) and positive reinforcement motives ($r^2=.126$). All paths in the final model were significant at $\alpha=.05$ (fig. 6).

Indirect paths were analyzed to examine the mediational relationships of the drinking motives. Significant mediational roles were found for both coping and conformity motives between sex-role egalitarianism and alcohol use (-.030, -.043) as well as for coping motives between reflective norms and alcohol use (-.054). The mediational effect of coping between femininity and alcohol use was not significant (-.037, see fig. 7).

Discussion

Results indicate that the first hypothesis was supported but not in the anticipated direction. There was a significant direct effect of reflective norms on drinking behavior,
but this effect was negative, indicating that higher reported levels of reflective norms were related to lower levels of alcohol use. The first factor to keep in mind when examining this relationship is the poor reliability seen in the reflective norms measure. Although the three item measure which created from the work of Labrie and colleagues (2009) did indicate good loadings on the single reflective norms factor indicating high levels of validity, this is only a three item measure meaning fit indices are not available because it will always be a saturated model (a model having 0 degrees of freedom). This along with the poor reliability make the results from this measure suspect. The concept of reflective norms is relatively new to university level alcohol research and thus a valid and reliable measure is not yet available (Labrie, Cail, Hummer, Lac & Neighbors, 2009).

The second possible reason for this finding is a reversal paradox. The reversal paradox, also known as Simpson's Paradox (Simpson, 1951), refers to the occasion when two variables can have a positive (or negative) relationship, while at the same time having a negative (or positive) relationship within the levels of some third variable (Messick & Van de Geer, 1981). We can see in the case of this study that the correlation between reflective norms and alcohol use when not controlling for other variables is positive (r=.259), but when we look at the beta weight seen in the path analysis (which controls for the other variables) we find a significant negative relationship (β= -.083). This would indicate that the true direct relationship between reflective norms and alcohol use is in fact a negative relationship indicating higher levels of reflective norms predict lower levels of alcohol use. If this is the case then the positive correlation is actually caused by some third variable. Because the beta weight for this path, although significant,
was not very large, there is a possibility that a type I error has occurred and there is in fact no direct relationship between reflective norms and alcohol use. This could indicate a suppression effect in which another third variable actually completely suppresses the relationship between the two variables. This result would support the results found by Lewis and Neighbors (2004) that reflective norms do not directly predict alcohol use.

The results of the analysis of the indirect effect of reflective norms on alcohol use through coping motivations show a significant negative effect. This indicates that higher levels of reflective norms predict lower levels of drinking for coping reasons which then predicts lower levels of alcohol use. Higher levels of reflective norms may indicate the individual tends to care about social relationships and fitting in with their peers. Individuals who report drinking for coping reasons are more likely to drink alone and have alcohol related problems, which is considered abnormal and maladaptive (Cooper, Russel, & George, 1998, etc.). This then may indicate a lower level of interest in appearing to conform with social norms. This difference in these two types of people would explain why there appears to be a negative relationship between these two variables. These lower levels of coping then predict lower levels of alcohol consumption which supports previous research indicating a strong positive relationship between drinking for coping reasons and alcohol use (Cooper, Russel, & George, 1988; Cooper, 1994; Labrie, Ehret, Hummer, & Prenovost, 2012; etc.)

The next two hypotheses involving masculine and feminine gender identities were partially supported. Results indicate a direct negative relationship between higher levels of femininity and alcohol use. This means that individuals who hold more feminine
attributes tend to drink less than individuals who have fewer feminine personality attributes. This supports past research findings that femininity is inversely related to alcohol use in college students (Horowitz & White, 1987; Huselid & Cooper, 1992, etc.). This may also indicate the feminine personality traits act as a protective factor against problematic alcohol use. Feminine gender identity was also significantly related to coping motives. Specifically, higher levels of femininity predicted lower levels of coping motivations for alcohol use. This supports the idea that high levels of femininity are related to lower levels of alcohol-related problems. Because increased coping motives have been shown to be related to alcohol-related problems and femininity is related to lower levels of coping motives, it can be hypothesized that femininity would also be related to reduced levels of alcohol-related problems. Further research is needed to understand, within the confines of this model how femininity is related not only to alcohol use, but to alcohol-related consequences as well.

Results indicate that higher levels of masculine traits also predict lower levels of alcohol use by college women. Although the hypothesized result was opposite of this, previous research has been inconclusive in the area and often included a sample of both men and women. This result may support previous research of women in treatment programs for alcohol related problems. Many of these studies have found that these women are made up of a disproportionately large number of women who fit into the undifferentiated category of gender identity (Moller-Leimkuhler, Schwarz, Burtscheidt, & Gaebel, 2002). This suggests that having high levels of masculine or feminine traits may reduce the likelihood of problematic drinking behaviors, whereas having low levels
of both increases this risk, which is consistent with the results of this study. Other studies have also found that while the extremely stereotyped and socially undesirable masculine traits (aggressiveness, inability to express emotion, etc.) are related to increased alcohol use, the more desirable masculine traits (independence, assertiveness, etc.) are related to lower levels of alcohol use (Horowitz, 1997; Ricciardelli & Williams, 1995). For the current study, this appears to be the case. The items with the lowest overall means were "aggressive" and "forceful" (M=3.30, M=3.46), whereas masculine traits such as "independent" and "assertive" had the highest overall means for the masculine traits (M=5.76, M=5.86). This analysis suggests that for women, these socially valued masculine traits may also be a protective factor against heavy alcohol use.

Gender-role ideology was found not to directly predict alcohol use in college women. Other research has also found gender-role egalitarianism to not be directly related to alcohol consumption for women, but it has been shown to predict alcohol related problems in female adults (McCreary, Newcomb, and Sadava, 1999). Although the direct effect was not significant, both indirect effects were significant. Higher levels of gender-role egalitarianism predicted lower levels of both conformity and coping motives. Lower levels of these motives in turn predicted lower levels of alcohol consumption. These results tell us that although the expected direct effect was not found, gender-role ideology is still an important factor in female college student drinking. Specifically these indirect effects suggest that higher levels of gender-role egalitarianism are related to lower levels of drinking. This is opposite of the original hypothesis, but makes sense in terms of the mediational effects. Women who score higher on this scale
feel that women should be empowered and can and should be able to do everything a man can, it makes sense that this is negatively related to conformity motives, as empowered women should be less likely to act passively and conform to social norms. It also makes sense that these women would be less likely to drink to cope as this type of motive is related to problematic coping mechanisms and is considered socially inappropriate, not what we would expect from strong-willed, empowered women. Gender-role egalitarianism was also significantly positively related to positive-reinforcement motives, indicating that higher levels of egalitarianism predict higher reporting of drinking for positive reinforcement (to feel good, be social, etc.). Although this study did not find positive-reinforcement motives to significantly predict alcohol use, many past studies have show these variables to be significantly related and further research is needed to understand the reason for the conflicting results from past research and the current study.

Coping motivations were found to be positively related to alcohol use. This supports the hypothesis and past research indicating that individuals who report higher levels of coping motivations also tend to drink more than individuals who do not. The positive-reinforcement motives were also predicted to be positively related to alcohol use, but this effect was not found in this study. This could mean that for women these positive motives do not in actuality impact alcohol use. It could, however, indicate that these positive motives have an indirect effect on alcohol use through a variable not measured in this study. Although many researchers have shown strong positive relationships between alcohol use and positive reinforcement motives (Labrie, Ehret, Hummer, & Prenovost, 2012; Cooper, Russel, Skinner, & Windle, 1992; etc.) the results in this study are not the
first to question the use of positive-reinforcement motives as a predictor for alcohol use. Read, Wood, Kahler, Maddock, and Palfai (2003) found these motives to only be significantly related to alcohol consumption and alcohol related problems in one of their four samples. Further research is needed to understand the relationship between positive-reinforcement motives and alcohol use for college women due to the conflicting findings of the current study and past research.

Conformity motives were found to have a positive relationship with alcohol use. Although this is contrary to the hypothesis, some promising possible reasons for this association exist. Women have been found to be more likely to conform to social pressures than men (Gilligan, 1982) and this may make women more likely to report drinking for conformity reasons and drinking more often to fit in socially. Previous research often found a weak or nonexistent relationship between conformity motives and alcohol use in college students (Ham, Zamboanga, Bacon, & Garcia, 2009; Kuntsche & Cooper, 2010), although this study differs in that it specifically focuses on women. It is possible that although conformity motives are not often reported for men (as conforming to social norms tends to be less important for men) they are an important factor in alcohol use for women.

The correlated error that was added in between positive reinforcement motives and conformity motives indicates that some other unmeasured variable is influencing both of these measures. This is not surprising as much research has been done that has found differing variables that influence drinking motives. These variables include social anxiety (Ham, Zamboanga, Bacon, & Garcia, 2009), personality change (Littlefield, Sher,
& Wood, 2010), and alcohol expectancies (Black, 2010) just to name a few. Future models should take this information into account in order to better account for the variance in these two variables.

**Limitations**

One limitation to this study is that cause and effect relationships cannot be posited due to the fact that all variables were measured concurrently. Although it makes theoretical sense that motives would come before action (drinking behavior), it could also be argued that this is a cyclical process in which motives influence action followed by action influencing motives. In order to be more certain of the cause and effect relationship of these variables, each exogenous measure needs to measured prior to the endogenous variables.

A second limitation to this study is the possible reliability and validity problems presented from the reflective norms measure. As a relatively new concept, there has not been a reliable and validated measure created as of yet to measure opposite-sex reflective norms in relation to drinking behavior. This measure needs to be improved upon and put through the rigorous testing process that other measures in this study have undergone in order to be ready for interpretation.

**Future Directions**

Overall, this research provides a good building block for the creation of a comprehensive model of female college student drinking. Although we know from
previous research that there has been a dramatic increase in female college student drinking, the independent variables in this study (gender ideology, gender-identity, and reflective norms) all appear to reduce the likelihood of drinking. This finding is very important as it tells us that increasing gender equality and positive masculine traits for women can act as a protective factor against problematic drinking behaviors. These results suggest that neither of the hypothesized reasons for the increase in female college drinking are correct. In fact, the increase in masculine traits in women and the increase in gender-role egalitarianism appear to be related to a reduction in female college drinking. At the same time, the idea that women are drinking because they believe college men are attracted to girls that can drink was not supported. The results show a negative relationship between reflective norms and alcohol use.

The next step is to discover which factors are related to an increase in female college student drinking. One possibility that was not included in this study are descriptive and injunctive norms. These have consistently been shown to be positively related to alcohol use, especially for women (Korkuska & Thombs, 2003; Borsari & Carey, 2003). It is also important to further examine the relationship between the positive reinforcement drinking motives and alcohol use. Many other researchers have shown a positive relationship between these two variables, where none was found in the current study (Labrie, Ehret, Hummer, & Prevonost, 2012; Cooper, Russel, Skinner, & Windle, 1992; etc.) Further research is needed to discover if this is simply due to sampling error or if there is some other variable that is mediating the relationship between positive reinforcement and alcohol use.
Any model of alcohol use is inherently going to be complex as there are a large number of factors that have already been discovered to be important predictors and more variables are continually being found. This model predicts a fairly substantial portion of the variance in alcohol use, though it certainly has room for improvement. Future models should use the information discovered here and build upon it by including other variables that may be important in understanding the correlates of female college student drinking, as well as taking the model a step further to understand which of these correlates not only increase alcohol use but increase alcohol related problems as well. Although increased alcohol use in itself can be dangerous and hazardous to health, many of the issues associated with increased alcohol use are the real problem, such as decreased academic performance, increase risk taking, an increase in engaging in risky sexual behaviors, the increased likelihood of sexual assault for women, among man others.

In conclusion, this study has unearthed many interesting findings that contradict the results of other research. This demonstrates the need for further research into understanding female college student drinking, especially due to the sizable increase in alcohol use this population has seen over the past 25 years. Although the current study cannot fully answer the question "why have we seen an increase in female college student drinking" it can lead us toward the answer by providing the the next step in the creation of a comprehensive model.
REFERENCES


APPENDIX

Fig. 1: Descriptive Statistics

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<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
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<tr>
<td>Sex-Role Egalitarianism</td>
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<tr>
<td>Masculinity</td>
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<td>3.09</td>
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Fig. 2: Correlation Matrix

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<th>5.</th>
<th>6.</th>
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<td>2. Masculinity</td>
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<td>3. Femininity</td>
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<td>4. Reflective Norms</td>
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<td>5. Conformity Motives</td>
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<td>6. Coping Motives</td>
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<td>.205*</td>
<td>.373*</td>
<td>.544*</td>
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<td>8. Alcohol Use</td>
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<td>.000</td>
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*p<.05
Fig. 3: Baseline Path Analysis Model

Fig. 4: Beta Weights for Baseline Path Model

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<th>Exogenous Variables</th>
<th>Endogenous Variables</th>
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<td>DM - Coping</td>
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<td>DM - Pos Reinforcement</td>
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*p < .05
Fig. 5: Fit indices for Each Model Step

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<th>df</th>
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<th>RMSEA</th>
<th>SRMR</th>
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<td>11.</td>
<td>Added: Conformity with PR</td>
<td>23.586</td>
<td>11</td>
<td>.951</td>
<td>.056</td>
<td>.056</td>
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*Note: Robust Maximum Likelihood Estimation was used, chi-square difference tests cannot be applied.*
Fig. 6: Final Path Model

Note: *p<.05, **p<.01

Fig. 7: Indirect, Direct, and Total Effects

<table>
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<tr>
<th></th>
<th>Coping</th>
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<th>Total Indirect</th>
<th>Total Direct</th>
<th>Total</th>
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<td>-.073*</td>
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Note: *p<.05