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Times Are a Changin': Gender Role Orientation and Alcohol Use

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By

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ABSTRACT

Alcohol misuse is an important public health concern as it is related to an elevated probability of experiencing a number of negative life events. Historically, alcohol consumption patterns seemed to differ according to sex, but more recent research suggests that the difference has narrowed as gender role orientations have converged. Further, it seems that gender role orientation more reliably predicts differences in patterns of use than biological sex. The goal of this two-part study was to investigate the relation of gender role orientation and alcohol use behaviors with the expectation that masculine gender role orientation would be associated with these behaviors and related motives for use. Results obtained through structural equation modeling techniques suggest a unique relationship between gender role orientation and alcohol consumption behaviors that may function through a consumption motives pathway. It seems that individuals who endorse low levels of gender role typed characteristics consume alcohol at increased rates and that coping motives may mediate this relationship.

Keywords: Gender Role Orientation, Alcohol, Coping, Drinking Motives, Structural Equation Modeling

This thesis is approved for recommendation
to the Graduate Council.

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According to a 2002 study conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), as many as 90% of adults in the U.S. have had some experience with alcohol in their lifetimes and more than half of these adults consider themselves current drinkers (NIAAA, 2006; SAMHSA, 2009). A substantial number of individuals who consume alcohol (60% of men and 30% of women) experience at least one alcohol-related negative life event (e.g., driving while under the influence or personal injury). In addition, the lifetime risk for developing an alcohol use disorder is approximately 30% in the general population (NIAAA, 2006). Alcohol use is a broadly reaching phenomenon that is related to a number of negative outcomes (e.g., CDC, 2011; NCVS, 2010). Considering this, research focusing on variables that might be associated with alcohol use is warranted.

Historically, research suggested that the prevalence of alcohol use and dependence differed according to biological sex, with males endorsing more overall use, as well as more hazardous use, than women (Helzer & Pryzbeck, 1988; Horwitz & White, 1987; Kessler et al., 1994). These differences in use remained significant even when considering the differential effects of biology on alcohol absorption and metabolism rates across men and women (Corrigan, 1985; McCrady, 1988; Ward & Coutelle, 2003). Despite extensive research on sex differences in alcohol use pathology, no definitive conclusions about the variables that might be related to these differences have been made (Horwitz & White, 1987).

Research assessing change in alcohol use behaviors over time suggests that the historical gap between alcohol use levels across biological sex has narrowed in individuals coming of age in the 1970s and later when gender role orientations may have begun to be influenced by broader social change (Saelan et al., 1992; Maney, 1990; McPherson et al., 2004). For example, Keyes,

Grant, and Hasin (2007) examined overall rates of alcohol consumption in adults over age eighteen across four cohort groups (i.e., born in 1913–1932, 1933–1949, 1950–1967, 1968–1984). These researchers found significant decreases in sex differences in alcohol use behaviors from the oldest to youngest cohorts and offer this as evidence of a change in drinking patterns by sex over time. In addition to the observed changes in rates of alcohol consumption by sex, Greenfield and Room (1997) observed diminished differences in sex-specific drinking norms since the 1970s. These researchers assessed situational drinking norms (perceptions of acceptable levels of consumption for different contexts) for adults using data from nationwide surveys conducted in 1979 ($n = 1772$), 1984 ($n = 5221$) and 1990 ($n = 2058$) and found that norms for drinking converged by sex over time, with norms for men and women being more similar in 1990 than at earlier time points. It seems that, as predicted by the convergence hypothesis, previously sex-typed alcohol consumption behaviors as well as related norms are becoming more similar across biological sex groups as men and women's professional roles merge. (e.g., Bell, Havlicek, and Roncek 1984; Ferrance 1980; Fillmore 1984; Wilsnack and Wilsnack 1978).

As these behaviors have merged, we also see a convergence in rates of alcohol-related negative consequences across men and women. When considering a broad range of negative consequences that include not only events characterized as public deviance (e.g., arrest for public intoxication or driving while intoxicated), but also more personal events like unintended sexual activity and injury to self, Perkins (2002) found that college women were experiencing negative consequences at a rate that is not significantly different from college men. This research suggests that not only are alcohol consumption patterns across men and women becoming more similar, but that this may be a dangerous trend in terms of the negative consequences that women may experience. In general, it seems that men and women coming of age after the 1970s are

consuming alcohol at increasingly similar rates and experiencing similar levels of negative consequences.

The purpose of the current study was to address questions about the relation of alcohol use and biological sex in light of recent research suggesting that the historical gap between alcohol use levels across biological sex has narrowed and that this narrowing has paralleled a convergence of culturally scripted gender-specific behaviors, or gender role orientations (Plant, Miller, & Plant, 2005). Almost three-quarters of college graduates in the U.S. are women (National Center for Education Statistics, 2007) and 70% of women work outside the home (Porter, 2006). Consistent with the convergence hypothesis, it seems that as women become more active in the workplace and the family structure evolves, traditional gender roles are becoming less sex-typed and more reflective of social function. As sex roles in society converge and overlap, traditional conceptions of gender roles begin to converge also.

As evidence for the convergence hypothesis emerges, it seems reasonable to consider the possibility that the complicated relationship between alcohol use and sex may be related to gender role orientation and that changes in traditional gender role orientation, specifically for women, may be associated with accompanying changes in alcohol consumption behaviors (e.g., an increase in drinking for women who identify with less traditional gender role orientations). Although traditional conceptualizations of femininity are still active, women's personal endorsement of and identification with those ideas may be decreasing. Reflecting our patriarchal roots, masculinity and masculine characteristics are still preferred in the public domain, and as a result, women are adopting more masculine gender orientations (Gelade, Dobson, & Auer, 2008; Merkin & Ramadan, 2010). Characteristics associated with masculinity, whether adaptive or maladaptive, are more likely to be reinforced in the public domain aside the possible derogation

of traditional feminine traits (Elias, 2008; Pullen & Simpson, 2009). As women adopt more positive masculine characteristics, like independence, competitiveness and autonomy, they might also adopt more potentially harmful characteristics like a tendency to use substances at high rates (LaBrie et al., 2010). The current study aimed to continue the evaluation of proposed mechanistic variables in new ways in an effort to further elucidate the relation of alcohol use and gender role orientation. By more completely understanding how these variables work together to encourage misuse and addiction, it might be possible to halt the mechanistic processes that lead to negative outcomes (Ayer, Harder, Rose, & Helzer, 2011).

Defining the Constructs

Gender role orientation. It seems that there is a lack of consensus concerning the definitions and best measurement practices for constructs related to gender role orientation. Many studies simply use biological sex as an indicator of gender or gender role orientation, or draw conclusions based on sex indicated gender role orientation, but this is inconsistent with the nature of the construct (e.g.,Munne, 2005;Van Gundy, Schieman, Kelly, & Rebellon, 2005, etc.) Gender role orientation is related to biological sex, but is a much broader, more nuanced construct. Gender role orientation is a reflection of the constellation of personality traits an individual endorses or portrays that have been recognized in society as feminine and/or masculine elements. Using biological sex as an indicator of gender role orientation artificially creates a "sex-role dichotomy" whereby individuals and related measurements are artificially limited (Bem, 1974, p. 155). Bem (e.g., 1974, 1993) and other leading researchers (Spence, Helmreich, & Strapp, 1973) suggest that masculinity and femininity should be treated as two discrete dimensions and that a bidimensional model of gender role orientation is most appropriate. This bidimensional model allows an individual to endorse traits consistent with both

masculine and feminine orientations, suggesting that individuals can be "both masculine and feminine, both assertive and yielding, and both instrumental and expressive" depending on which behaviors might be most appropriate in a given situation (Bem, 1974, p. 155). Barrett and White (2002) offer contemporary support for this bidimensional model in a study of the trajectories of gender role orientation over maturation, finding evidence that having information about an individual's biological sex does not allow reliable prediction of gender role orientation. This categorical variable is not able to account for variation found within the bidimensional construct.

Accepting the bidimensional model of gender role orientation, researchers have suggested that validity in measurement of this construct is best achieved by using the Bem Sex Role Inventory (BSRI; Bem, 1974) in conjunction with the Personal Attributes Questionnaire (PAQ; Spence, Helmrich, & Strapp, 1973) (Choi, 2004; Choi et al., 2007; Peralta, Nofziger & Rickles, 2010). Both of these measures assess femininity and masculinity independently allowing for the duality discussed above. The measures provide assessments of gender role orientation based on the respondent's self-reported possession of personality traits stereotypically associated with each gender. Although these measures are similar, the scores obtained reflect slightly different facets of the construct. The BSRI was intended to assess an individual's orientation within the culture's global definition of masculinity and femininity while the authors of the PAQ intended to measure only the "self-assertive-instrumental" traits associated with masculinity and the "interpersonal-expressive" traits associated with stereotypical femininity (Lenney, 1991). The use of both measures, then, allows for a more intricate examination of the construct of interest. While there are other measures that assess constructs similar to gender role orientation, the BSRI and PAQ assess, most precisely, the construct of interest.

Alcohol use behaviors. Research exploring alcohol use behaviors often operationalizes these behaviors in one of two ways, either by assessing self-reports of quantity and frequency characteristics along with experiences of negative consequences associated with use or by measuring the concentration of alcohol in the blood by measuring Breath Alcohol Concentration (BrAC), Blood Alcohol Concentration, or estimating based on weight and sex. For the present studies, I employed two methods of assessment, using BrAC in the first study and a measure of quantity, frequency, and negative consequences in the second. It seems that women process alcohol slightly more quickly than men and that more of the alcohol they consume enters their bloodstream (Thomasson, 1995). Research suggests that female binge drinkers often achieve significantly higher breath alcohol concentration levels than male binge drinkers, possibly due to differences in rates of metabolism (Fillmore & Jude, 2011). It is important to consider these differences when conceptualizing alcohol use behaviors, as they suggest that measures of true differences should incorporate assessments of consumption frequency and quantity but also more objective measures of achieved breath alcohol concentration to control for the effects of biology. Thus, alcohol use behaviors were operationally defined as BrAC in the first study, and quantity, frequency, and related negative consequences in the second study.

Gender Role Orientation and Alcohol Use

In a landmark study, Huselid and Cooper (1992) demonstrated that alcohol use is more reliably predicted by gender role orientation than biological sex in adolescents ($N = 1077$, ages 13-19). They suggested, more specifically, that adolescent boys who identified with traditional masculine gender role attributes (i.e., competitiveness, autonomy) drank more heavily than boys self-reporting a less conventional orientation, whereas teenage girls reporting traditional femininity (i.e., expressivity, compassion) drank less than their non-conventional counterpart.

These results, based on assessment of gender role orientation with the PAQ, showed no significant difference in the proportion of boys and girls who reported any alcohol consumption in the past 30 days, but did suggest that individuals identifying with masculine orientation drank more often, more heavily, and experienced more alcohol-related problems than endorsers of the feminine gender role orientation above and beyond the effects of biological sex. Additionally, results suggested that traditionally feminine expressive traits (i.e., verbalizing emotions and utilizing social support networks) were negatively related to alcohol use and abuse and that the traditionally masculine trait of emotional control (i.e., resisting emotional expression) was positively associated with alcohol consumption. The researchers concluded that sex differences in alcohol use were mediated by gender role orientation.

Research by Peralta, Steele, Nofziger & Rickles (2010) examining this relationship in college students also suggests that gender role orientation is associated with alcohol consumption behaviors. The study examined this relationship in a sample of 422 college students (ages 18-25) using both the PAQ and BSRI to measure gender role orientation. These researchers conclude that gender role orientation plays a significant role in alcohol use behaviors and specifically that regardless of sex, masculine gender orientation assessed by both measures was predictive of higher rates of binge drinking (i.e., more than 4 drinks for women and 5 for men consumed in a single evening). Further, feminine gender orientation derived from the PAQ was associated with lower rates of binge drinking, while femininity as measured by the BSRI was not significantly associated with binge drinking. It seems that individuals who endorse a predominantly masculine gender role orientation consume alcohol more frequently and in greater amounts than individuals endorsing a feminine gender orientation.

Additionally, research among adolescents suggests that social learning related to traditional sex-typed roles is associated with increased risk for alcohol use for men, further suggesting that men taught to identify with masculine gender role orientations are at a greater risk for increased alcohol use (Schulte, Ramo & Brown; 2009). In fact, McCreary, Newcomb, and Sadava (1999) reported that the more traditional attitudes adult men hold about gender roles, the more alcohol they reported consuming. It has been established that, in Western cultures, alcohol consumption is strongly linked to masculine gender orientations and "manliness."

As masculine characteristics tend to be valued in Western societies, behaviors associated with masculinity might be reinforced. As women adopt more masculine characteristics, differential reinforcement of behaviors might encourage women to begin employing strategies that have lead traditionally masculine individuals to rely on alcohol use for coping and conformity reasons. Therefore, the current study addressed gender role orientation, motives for use, and alcohol use in samples consisting of adult men and women.

Gender Role Orientation and Consumption Motives

Consumption motives, the psychological function that drinking fulfills or simply the reasons people choose to consume alcohol (Baer, 2002; Cooper, 1994; Ham & Hope, 2003), seem to be an important common pathway predicting levels of alcohol use through which more distal risk factors (e.g., gender orientation) exert their influence. Research suggests that these motives could function differentially across gender role orientation and that different motives for use might result in differential consumption behaviors (Cooper, 1994).

Currently, a four-factor model of consumption motives: coping, conformity, enhancement, and social, seems to best explain this construct (Cooper, 1994). Cooper and other researchers suggest that individuals consume alcohol in an effort to achieve a particular outcome

(Cox & Klinger, 1988) and that related drinking behavior differs based on these motivations (Cutter & O'Farrell, 1984; Cooper, 1988). Considering this, understanding an individual's motivation or motives for drinking may offer information about when and how much they may drink along with probable consequences.

Research assessing gender role orientation suggests that when considering the relation of drinking motives and gender role orientation, coping and conformity motives are most salient (Williams & Ricciardelli, 1999). A study by Williams and Ricciardelli (1999) examining drinking motives and stereotypical gender role orientation employing the Australian Sex-role scale, a culturally-specific adaptation of the PAQ (Spence, Helmrich, & Holman, 1979) in a sample of college age adults, found that both men and women who endorsed a masculine gender role orientation used alcohol at elevated levels (compared to feminine oriented individuals) and that these masculine oriented individuals were more likely to report consuming alcohol as a way to conform to social norms of masculinity (conformity drinking) and reinforce their masculinity (confirmatory drinking). Conformity drinking, consuming in order to avoid peer rejection and social disapproval, has been identified as a relevant reason for drinking in many populations (Farber, Khavari, & Douglas, 1980; Schelleman-Offermans, Kuntsche, & Knibbe, 2011). Confirmatory drinking, consuming alcohol to reinforce, or confirm, the masculine gender role stereotype regarding alcohol consumption, reliably predicted alcohol use in men who endorse masculine gender orientations while this effect was not found for women.

Coping motives, or drinking to cope, involves drinking to avoid the experience of negative affective states such as depression or anxiety (e.g., Cooper, 1994). Research suggests that masculinity predicts the use of specific coping behaviors more strongly than femininity (Nezu, & Nezu, 1987) and that the masculine gender orientation is associated with self-reported

use of coping strategies based on substance use whereas the feminine gender orientation is strongly correlated with lower use of substances for coping (Hobfoll, Dunahoo, Ben-Porath, & Monnier, 1994; Lengua & Stormshank, 2000; Ptacek, Smith, & Dodge, 1994). Considering evidence that emotional avoidant coping is associated with higher levels of substance abuse (Blalock & Joiner, 2000; Cooper, Russell, Skinner, Frone, & Mudar, 1992; Wills, 1986), it may be that elements of masculine socialization encourage alcohol use as a coping mechanism beyond what would be associated with conformity motives alone. This is particularly important when considering that these negative reinforcement motives for drinking tend to be associated with higher rates of alcohol-related problems, even when controlling for alcohol consumption rates (Carpenter & Hasin, 1999; Cooper, 1994).

The Current Studies

The current pair of studies aimed to integrate the evidence presented in previous research while further exploring the relation of biological sex, gender role orientation, alcohol use motives, and alcohol consumption behaviors. The first study examined the relation between gender role orientation and current level of intoxication (i.e., breath alcohol concentration, BrAC) as well as the mediating role of drinking motives (i.e., conformity and coping motives) among legal-aged participants who reported spending time at a local bar, most consuming alcohol, on the evening of the study. Recruiting participants who have been consuming alcohol on the night of assessment in natural settings allowed for an examination of the relations of gender role orientation and consumption motives at varying levels of alcohol intoxication. Additionally, using BrAC as the outcome measure more completely ensured that the results would not be influenced by inaccuracies in self-reported drinking behavior or by metabolic

differences associated with biological sex. BrAC offers a measure that naturally controls for the effects of biology.

The goal of the second study was to build upon the first by examining these same relations using a measure of alcohol use behaviors based on retrospective self-reports of typical quantity and frequency patterns as well as negative outcomes. Although the first study was limited by the intoxication of participants as well as the relatively limited number of gender role orientation questionnaire items, these shortcomings were addressed in the second study utilizing sober legal-aged participants completing more thorough assessments of the variables of interest.

The studies tested the hypothesized model depicted in Figure 1. First, it was expected that biological sex would be associated with each respective gender role orientation. Specifically, it was expected that women would endorse higher levels of femininity and men would endorse higher levels of masculinity. Additionally, masculine gender orientation was hypothesized to be associated with increased drinking for both coping and conformity motives and that higher endorsement of these motives would be associated with higher levels of alcohol use behaviors (i.e., breath alcohol concentration as well as quantity and frequency of use). Further, it was hypothesized that gender role orientation would mediate the association between biological sex and drinking motives (i.e., coping and conformity) and that drinking motives would mediate the association between gender role identification and drinking behavior. Specifically, it was expected that, regardless of biological sex, those endorsing masculine gender roles would exhibit higher levels of use behaviors related to increased use for coping and conformity motives than those who endorse lower levels of masculine behaviors or higher levels of feminine behaviors.

Study 1

Alcohol use behaviors, drinking motives, and gender role orientation were examined utilizing a naturalistic observation method characterized by the collection of data assessing current states or behaviors in real-world environments. This methodology allows for an examination of alcohol use behaviors as they happen in the natural environments in which they occur. It is difficult for people to reliably rate past feelings as well as make predictions about hypothetical future feelings (e.g., Solhan, Trull, Jahng, & Wood, 2009, Todd et al., 2004). and it is reasonable to assume that this bias may be more pronounced when considering the memory and judgment impairments associated with substance use (Schiffman, 2009). This field study method allowed for minimizing associated self-report biases in relation to alcohol use behaviors. It was expected that individuals who identify with masculinity would exhibit higher BrAC levels and report more frequently consuming alcohol for coping and conformity motives. It was predicted that consumption motives would have a mediating role in the relation of gender role orientation and alcohol use as measured by momentary BrAC.

Method

Participants. Participants were 374 individuals over the age of 21who spent part of their evening at a local bar in a moderate-sized community in a Midsouthern college town (62% male, ages 21-64). All participants showing interest in participation and meeting eligibility requirements (i.e., age 21 or older and not exhibiting behaviors associated with extreme intoxication like stumbling or slurred speech) were allowed to complete the study and were compensated with the knowledge of their current BrAC. See Table 1 for a summary of demographic information.

Measures. For pragmatic reasons related to the intoxication of the participants, the questionnaire packet was limited to two pages, using large font with sufficient space between items to increase readability, and included two responses given orally. The short questionnaire packet included items assessing demographics, drinking motives, and gender role orientation. See Table 2 for descriptive information for all variables.

Demographic variables. Biological sex and ethnicity were reported to the experimenter orally then recorded in the questionnaire packet. Within the questionnaire packet, participants were asked to indicate age. For a summary of demographic information please refer to Table 1.

Gender role orientation. Gender role orientation was measured using four items selected from the 60-item Bem Sex Role Inventory (BSRI; Bem, 1974). The BSRI asks participants to choose adjectives that describe them from a large list of 60 adjectives (i.e., 20 items relating to masculine gender orientation, 20 to feminine gender orientation, and 20 items considered theoretically gender neutral but positive). We included only four items (2 items related to masculine gender role orientation and 2 items related to feminine gender role orientation) in order to minimize the length of the questionnaire packet. These four items were specifically chosen based on strong factor loading on the masculine (Masculine = .99; Competitiveness = .99), and feminine (Feminine = .99; Compassionate = .88) gender role orientation factors of interest (Choi, Fuqua, & Newman, 2007). Consistent with the full BSRI, participants were asked to rate themselves on a scale ranging from 1 (*Does not describe me*) to 7 (*Describes me very well*) according to how descriptive each adjective is of them. The BSRI conceptualizes gender role orientation bidimensionally and as a result yields both a masculine and feminine index score, with higher scores indicating increased orientation toward related characteristics. The 'compassion' and 'feminine' items were collapsed into a "femininity" scale and the

'competitive' and 'masculine' items were collapsed to create a "masculinity" scale. For descriptive information for all quantitative variables please refer to Table 2.

Drinking motives. The Drinking Motives Questionnaire-Revised (DMQ-R; Cooper, 1994) was modified to measure motives for alcohol consumption during the present drinking occasion. The DMQ-R is a 20-item measure based on Cooper's (1994) four-factor model of drinking motives discussed above. The representative factors include social, coping, enhancement, and conformity motives subscales, each containing five items. Participants rated how much each of the listed reasons for drinking motivated them to consume alcohol on the night of study participation using a Likert-type scale with values ranging from 1 (*not at all*) to 5 (*very much so*). The items measuring coping and conformity motives for drinking were aggregated into average scale scores according to recommendations by Cooper (1994) and used in analyses. The DMQ-R has been shown to have adequate predictive and concurrent validity within a sample of adults similar to the population in the present study (Cooper, 1994). The internal consistency was found to be good in the present sample (conformity motives $\alpha = .87$; coping motives $\alpha = .83$).

Alcohol use behaviors. BrAC was used as a measure of momentary drinking behavior using an Alco-Sensor FST® breathalyzer (ASFST), the industry and research standard approved by the U.S. Department of Transportation and the National Highway Traffic Safety Administration. The ASFST provides precise, accurate, repeatable results on direct breath sample testing and is specifically designed to offer a simple testing procedure for the quick screening of a large number of subjects. This type of breathalyzer uses fuel cell technology that offers consistent output, resulting in evidentiary grade analysis. Fuel cell sensors are highly specific to alcohol detection and so provide reliable and valid measures of BrAC.

Procedure. The experimenters positioned themselves on public property adjacent to several local bars over the course of 11 evenings in the fall of 2011. Potential participants were approached and asked to participate in a short study about opinions on social issues as well as alcohol use behaviors. They were informed that the study involved answering a series of questionnaires then blowing into a breathalyzer to have their BrAC measured. Oral consent to participate was obtained before participation. Participants who showed visible signs of significant intoxication such as stumbling, falling, or slurring speech were not allowed to participate; however, prohibiting interested parties from participating based on these criteria was never necessary. Participants who were smoking cigarettes were required to stop smoking before they began the questionnaire, allowing at least 5 minutes between cessation and testing, in order to obtain valid BrAC results as well as protect the ASFST from damage by smoke exhaled during the assessment. Participants were given a clipboard with the questionnaire packet and a pen. After completing the packet, participants were given verbal instructions, as suggested in the training video that accompanied the ASFST, to, "stand up straight, with your arms and hands down at your sides," in front of the experimenter then, "blow in a strong steady stream" into the ASFST disposable mouthpiece, "until you hear a click." Each mouthpiece was discarded and replaced before use by the next participant. Output of the BrAC measure takes approximately 15 seconds. Following this short wait, participants were allowed to look at the display screen and see their BrAC reading. At this point they could choose whether or not to share their reading with others. The second experimenter then recorded the obtained BrAC, as well as the ethnicity and sex of the participant assessed verbally. At no point were names of participants recorded.

When finished with all previous steps, participants were given a verbal description of our research and short debriefing about the study. Specifically, they were told that data were being

collected as part of a master's thesis project examining the relation between alcohol consumption, gender role orientation, and motives for drinking. Participants were also given a debriefing form with contact information for our lab (including their participant number) should anyone want to later rescind consent. Oral, rather than written, consent was obtained in an effort to maintain absolute anonymity of participants engaging in alcohol use behaviors. The procedures related to providing participants with a method for rescinding consent was employed to ensure that participants were given a chance to change their minds about participating in the study when they were no longer under the influence of alcohol. No one contacted the lab in an effort to rescind consent.

Data Analytic Plan

Structural Equation Modeling (SEM) was used to test the model pictured in Figure 1, using maximum likelihood estimation in AMOS 20.0. All variables are observed variables, represented by rectangles. Absence of a line connecting variables implies lack of a hypothesized direct effect. Indices of absolute fit (χ^2), comparative fit (comparative fit index [CFI]), and fit with a penalty function for lack of parsimony (root mean square error of approximation [RMSEA]) were selected to assess model fit. Attained CFI values of .95 or above, RMSEA values of .08 or below and non-significant values for the χ^2 tests generally represent a good fit to the data (Hu & Bentler, 1999; Tabachnick & Fidell, 2007). Because significance of χ^2 values is easily impacted by a number of issues (e.g., sample size that is too large or small) the ratio of the χ^2 value to the degrees of freedom in the model was also examined. Tabachnick and Fidell (2007) suggest that this value suggests adequate fit of the model to the data when the ratio is below 2.

The dataset contained responses from 374 individuals (62.3% male). A significant amount of missing data were associated with the gender role identity questions (10.9%) as well

as coping and conformity motives (8.0%) measured by the DMQ-R. It was found that these data were missing at random. Because of the small number of items (i.e., 2) associated with the gender role orientation constructs, cases missing these data points were left out of analyses. To correct for randomly missing coping and conformity motives scores, a regression-based imputation method was used to estimate values. Eight cases were not amenable to imputation because of missing data on the related scales used for estimation. A small number of cases did not indicate sex ($n = 3$) or record BrAC readings ($n = 18$), and were omitted from analyses leaving a final sample size of 335.

There were no univariate or multivariate outliers. All variables, besides BrAC and conformity which were both positively skewed (skewness statistic >2; Tabachnick & Fidell, 2007), were normally distributed with no significant skew or kurtosis. A logarithmic transformation on the BrAC and conformity variables resulted in statistical normality for both variables. Scatterplots and correlations suggest linearity and an absence of multicollinearity (Pearson correlations < .7; Tabachnick & Fidell, 2007). See Table 3 for a correlation matrix.

Results

Zero-order correlations revealed that the two items conceptualized to assess each gender orientation did indeed correlate significantly with one another but did not correlate to a degree to produce redundancy suggesting that the items were assessing similar constructs (see Table 4). As expected, femininity and masculinity composite scores were significantly negatively correlated suggesting that they are best conceptualized as separate but related constructs.

Contrary to the hypothesized model, fit indices suggested that the original model was a poor fit to the data. The CFI was found to be in the unacceptable range (CFI = .70), χ^2 values

were significant and the χ^2/df ratio was too large (χ^2= 138.68, df = 5, χ^2/df=27.74, p< .05). The RMSEA value was also too large and suggested poor fit (RMSEA=.28 [.24 - .32]).

In order to achieve a better fit, modifications to the model were made based on statistical and conceptual considerations. Modification indices suggested the addition of a correlated pathway between the error of measurement associated with coping and conformity motives. This is likely because these questions were presented in similar formats in the same questionnaire. Correlating these terms helped control for any error associated with the logistics of assessment. The addition of the correlated error path resulted in a good-fitting solution (χ^2 =5.735, df = 3, p = .125, χ^2/df = 1.92; CFI = .994; RMSEA = .05 [.00-.12]).

As shown in Figure 2, biological sex was significantly predictive of gender role orientation. Specifically, women reported higher feminine orientation than men (unstandardized coefficient = 3.47, p < .01), while men reported higher masculine orientation than women (unstandardized coefficient = -4.34, p < .01). Results suggest that femininity was not significantly associated with consuming alcohol for coping (unstandardized coefficient = .03) or conformity motives (unstandardized coefficient = -.002). Contrary to hypothesizes, masculinity was not significantly associated with either coping (unstandardized coefficient = .01) or conformity motivations for drinking (unstandardized coefficient = .003).

While neither masculinity (unstandardized coefficient < .001) nor conformity drinking motives (unstandardized coefficient = -.002) were associated with BrAC, as self-reported frequency of coping related motives for drinking during the current drinking occasion increased (unstandardized coefficient = .01, p < .05), BrAC readings also increased. Further, femininity was associated with BrAC such that a lower feminine orientation was associated with an increased BrAC (unstandardized coefficient < .001, p < .05). Femininity was not significantly

associated with coping (unstandardized coefficient = .03,) or conformity motives (unstandardized coefficient = -.002).

Results suggest that the hypothesized mediation effects were non-significant. Gender role orientation did not mediate the relationship between biological sex and BrAC (Feminine unstandardized coefficient < .001, p = .18; Masculine unstandardized coefficient < .001, p = .54). Neither coping (unstandardized coefficient = .08, p = .13) nor conformity motives (unstandardized coefficient = .01, p = .30) mediated the relationship between gender role orientation and BrAC. Five percent of the variance in BrAC was accounted for by the variables in the model (i.e., biological sex, gender role orientation, and coping and conformity motives).

Study 2

While the first study examined the alcohol use behaviors of individuals, their gender role orientation, and drinking motives while intoxicated, the second study aimed to further explore the model depicted in Figure 1 by using an online survey to examine these relations in a sample of individuals who were sober when completing the questionnaires. In addition, this strategy allowed us to use more comprehensive, well-validated measures under conditions that are conducive to accurate reporting.

Method

Participants. Participants were 545 legal-aged individuals recruited through Mechanical Turk who reported alcohol consumption within the last 6 months but not in the last 24 hours (41% men; 77.8% Caucasian; M_{age} = 34.5, range = 21-73). The Mechanical Turk crowdsourcing service has capabilities which allowed the researcher to specify relatively equal numbers of participants of each sex living within the contiguous United States above the age of 21. It was also required that participants be in good standing with the Mechanical Turk body of users and

have a "quality rating" of .90 or better reflecting accurate and complete responding in most instances. No other restrictions on participation were made. See Table 5 for a summary of the sample demographics

Measures. Participants completed a battery of questionnaires which included demographic information as well as measures of gender role orientation, drinking motives, and alcohol use.

Demographic variables. Demographic information (i.e., age, ethnicity, marital status, educational attainment, region of residence within the United States, and sexual orientation) was collected at the beginning of the study. In addition to biological sex, ethnicity and educational attainment were used as covariates in analyses.

Gender role orientation. Consistent with suggestions discussed above (Choi, 2004; Choi et al., 2007; Peralta, Nofziger & Rickles, 2010), this study used the Bem Sex Role Inventory (BSRI; Bem, 1974) in conjunction with the Personal Attributes Questionnaire (PAQ; Spence, Helmrich, & Strapp, 1973) to assess this gender role orientation. Please refer to Table 6 for descriptive information about all variables.

Bem Sex Role Inventory. The complete BSRI, a 60-item self-report questionnaire, was used to assess gender role orientation. The masculine and feminine gender role orientation scales were created by compiling a list of 200 personality traits that were positively valued and stereotypically masculine or feminine and 200 other traits that were judged to be neither masculine nor feminine but still positively valued. These 400 items were presented to two groups of raters to assess the social desirability of each characteristic for each gender role. Traits that were consistently rated as desirable for a man were included in the masculinity scale ($n = 20$) and traits that were consistently rated as desirable for a woman were included in the femininity scale

(n = 20). The 20 items related to each gender role orientation were averaged to create the respective scales. These scales have been shown to be reliable in previous research and the internal consistency was found to be good in the present sample (masculinity α = .88; femininity α = .85).

Personal Attributes Questionnaire. The Personal Attributes Questionnaire-Short Form (PAQ; Spence & Helmrich, 1978) was also used to assess gender role orientation. From this 24-item measure, the eight feminine items reflecting interpersonally oriented, expressive traits (e.g., aware of others' feelings, helpful to others) and the eight items reflecting masculine traits operationalized as goal-directed, instrumental behaviors (e.g., makes decisions easily, independent) were used in analyses. Participants were asked to indicate to what extent, on a Likert-type scale from 1 (*Not at all like me*) to 5 (*Very much like me*), the traits are characteristic of them. Scale scores were calculated by summing the items. This assessment has been shown to possess adequate reliability and validity in measurement for the masculine and feminine scales (Choi, 2004) used in the present study. The internal consistency was found to be acceptable, but relatively low, in the present sample (masculinity α = .58; femininity α = .61).

Drinking motives. Drinking motives were assessed with the DMQ-R. This measure is similar to that used in the first study except that instead of asking about the motives present on the single night of participation, this unaltered version assesses frequency of common motives for use over the previous 30 days. Items related to both the coping and conformity scales were averaged to create scale scores. The internal consistency was found to be good in the present sample (coping α = .88; femininity α = .89).

Alcohol Use. In order to measure alcohol use and hazardous drinking, we employed the Alcohol Use Disorders Identification Test, version 4 (AUDIT-4; Gual et al., 2002). This version

of the AUDIT uses the first three items from the original scale assessing quantity and frequency of consumption as well as the tenth item from the original scale assessing negative consequences associated with drinking (i.e., (1) How often do you have a drink containing alcohol?; (2) How many drinks containing alcohol do you have on a typical day when you are drinking?; (3) How often do you have six or more drinks on one occasion?; (10) Has a relative, friend, doctor, or another health worker been concerned about your drinking or suggested that you cut down?). Research suggests that this adaptation of the original and widely used Alcohol Use Disorders Identification Test (AUDIT: Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) shows reliability and validity similar to the full measure for identifying both men and women who consume large amounts of alcohol (Gual et al., 2002; Reinert & Allen, 2007). While the original 10-item AUDIT was administered to the participants, programming problems resulted in data loss that precluded the use of the 10-item scale. AUDIT- 4 scores were computed by aggregating scores on all four of the items in the assessment. The total was used in analyses based on suggestions by previous research (Gual et al., 2002). The internal consistency was found to be adequate in the present sample ($\alpha = .73$).

Procedure. The self-report survey packet was administered through a crowdsourcing web service, Mechanical Turk (Paolacci, Chandler & Ipeirotisis, 2010). Mechanical Turk is an online labor market where participants are recruited by "requesters" for the execution of tasks (called HITs, acronym for Human Intelligence Tasks) in exchange for a monetary reward specified by the requester. All participants interested in participating were provided with a description and examples of the tasks before consent and remained anonymous. After clicking on the link to the survey packet, participants encountered a brief passage explaining the requirements of the study as well as their rights as participants. Submitting an online signature

denoting understanding and agreement with the information in this paragraph served as informed consent. Participants were then given access to the survey packet through Qualtrics®. Individual questionnaires were randomly ordered across participants to reduce any effects of fatigue or bias. After completing the questionnaire packet, participants were shown a confirmation code to be entered on the original Mechanical Turk ® interface. If these criteria were met, participants were compensated for their time through Amazon.com in accordance with average compensation rates on the Mechanical Turk ® website ($1.66 per hour, or $.56 for completing the 20-minute survey, at the time the study was conducted; Paolacci et. al, 2010). Participants were then presented with a debriefing page briefly outlining the purpose of the study. The data were stored electronically by the Qualtrics® site then downloaded by the experimenter for analysis and archive.

Data Analytic Plan

The data analysis strategy for this was similar to that used in Study 1. SEM was used to test two models, one using each of the two gender role orientation measures. Ethnicity and highest level of educational attainment were included as covariates. The measure of gender-typed activities was not included as a covariate due to its unacceptable internal reliability in this sample.

The dataset contained responses from 545 individuals. Data from participants who indicated that they did not meet the stated qualifications were not used in analyses. Forty-eight cases were deleted because these individuals indicated that they had not consumed alcohol in the last 6 months, 30 cases were deleted because participants were under the age of 21, and 2 cases were deleted because they did not provide information about biological sex. Additionally, 39 cases were left out of analyses because the survey was left incomplete (i.e., the participant failed to provide answers for at least one entire multi-item measure).

Among the 426 cases remaining, there was a small amount of missing data associated with gender role orientation measures (PAQ: femininity = 6 missing, masculinity = 8; BSRI: femininity = 16, masculinity = 24), drinking motives scales (coping = 5; conformity = 4), and alcohol use (AUDIT-4) questions (2 cases). It was found that all data were missing at random. To correct for missing scores, we used a regression-based imputation method through the SPSS imputation add-on to estimate values. This left the final sample of 426 individuals used in data analyses.

There were no univariate or multivariate outliers. Skewness and kurtosis statistics suggest that all variables were normally distributed. Scatterplots suggest linearity and correlations suggest an absence of multicollinearity (Pearson correlations <.7; Tabachnick & Fidell, 2007).

Results

Zero-order correlations suggest that all variables in the model are correlated to some degree, offering justification for inclusion in the model. The masculine scales on each of the gender role orientation measures as well as the feminine scales on each measure were significantly strongly correlated with each other suggesting measurement of overlapping constructs. This is consistent with expectations based on previous research suggesting that the BSRI and PAQ masculinity and femininity scales measure very similar constructs but do so in slightly different ways (Frable, 1989; Spence, 1991). Absence of correlation between the masculine and feminine scales within the BSRI offers validity to the idea that these scales are measuring divergent traits. The masculine and feminine scales of the PAQ were significantly positively correlated. This is likely a reflection of some shared error resulting from the presentation of items in the same measure as well as some actual correlation of the constructs measured by each scale. The lack of relative correlational relationship of the masculine and

feminine scales of each assessment tool provides further evidence that these measures are assessing slightly different constructs.

When assessed by the BSRI, neither masculinity nor femininity correlated with consumption motives but when assessed by the PAQ both orientations were significantly correlated with motives for use. Further, gender role orientations, excluding masculinity as assessed by the PAQ, were significantly correlated with alcohol use. Finally, coping and conformity motives were significantly correlated with general alcohol use behaviors. Please see Table 7 for the correlation matrix.

Gender Role Orientation assessed by BSRI. The model proposed using the BSRI as an assessment of gender role orientation was associated with indices suggesting poor fit (CFI =.85; RMSEA=.09 [.07 - .11]) and the χ^2 statistics suggested inaccuracy in the model (χ^2 = 62.83; df = 14; χ^2/df= 4.49; $p < .001$). In order to achieve a better fit, modifications to the model were made based on statistical and conceptual considerations. Modification indices suggested the addition of three paths; one from biological sex to each motive variable and to the alcohol use variable. It seems that these modifications were reasonable as these would remove the variability associated metabolic differences across men and women by controlling for these biological differences within the model. This final model including the paths from sex to drinking-related variables achieved satisfactory fit with the data. The fit indices suggested good fit (CFI =.99) and the residuals were sufficiently small (RMSEA=.01 [.00 - .05]). The χ^2 value was nonsignificant ($p = .375$) and the ratio of the χ^2 value to the degrees of freedom in the model was within acceptable range, (χ^2= 11.86, df = 11; χ^2/11= 1.08). Overall, these values suggest that the model fit the data well.

As shown in Figure 3, after controlling for ethnicity, and educational attainment, biological sex was significantly associated with all endogenous variables. Specifically, women reported higher feminine orientation than men (unstandardized coefficient = .31, $p < .01$), while men reported higher masculine orientation than women (unstandardized coefficient = -.28, $p < .01$). Further, men reported having more coping (unstandardized coefficient = -1.5, $p < .01$) and conformity motives (unstandardized coefficient = -1.5, $p < .01$) for consuming alcohol than did women. Finally, men endorsed greater alcohol consumption behaviors (unstandardized coefficient = -1.5, $p < .01$) than did women.

After controlling for sex and the other covariates in the model, masculine gender role orientation was significantly associated with both coping and conformity motives for alcohol consumption. Increases in masculine orientation were significantly associated with decreased coping (unstandardized coefficient = -.97, $p < .05$) and conformity motives (unstandardized coefficient = -.78, $p < .05$) for alcohol consumption. Feminine gender role orientation was not significantly associated with either coping (unstandardized coefficient = -.36) or conformity (unstandardized coefficient = .11) motives for consuming alcohol.

As predicted, coping motives were significantly associated with consumption behavior after controlling for all other variables in the model. More frequent coping-motivated drinking was associated with higher levels of alcohol consumption behaviors (unstandardized coefficient = .26, $p < .01$). In contrast, conformity motives were not associated with consumption behavior (unstandardized coefficient = .001).

Coping motives served as a partial mediator in the association between sex and consumption behaviors (standardized indirect effect coefficient = .21, $p < .05$). Men were more likely to drink for coping motives and this predicted increased consumption. Coping motives also

served as a mediating variable in the association between gender role orientation and consumption behaviors (standardized indirect effect coefficient = -.05, $p < .05$). Contrary to expectations, decreased masculinity, after controlling for sex, was associated with reports of more frequently consuming alcohol for motives related to coping and this was related to increased consumption overall. Thirty-five percent of the variance in alcohol consumption behaviors was accounted for by the variables in the model (i.e., biological sex, gender role orientation, coping and conformity motives).

Gender role orientation assessed by PAQ. The model proposed using the PAQ as an assessment of gender role orientation was associated with indices suggesting poor fit (CFI =.77; RMSEA=.12 [.10 - .14]) and the χ^2 statistics suggested inaccuracy in the model ($\chi^2 = 95.91$; df = 14; χ^2/df= 6.85; $p < .001$). In order to achieve a better fit, modifications to the model were made based on statistical and conceptual considerations. Modification indices suggested the addition of 3 paths from biological sex to each motive variable and to the alcohol use variable. It seems, similar to the BSRI model, that the addition of those paths were reasonable as these would remove the variability associated metabolic differences across men and women by controlling for these biological differences within the model. In addition, modification indices suggested that a correlation of the error terms associated with each scale of the PAQ would be beneficial. The correlation of errors for these two scales would allow the model to control for any error associated with measure presentation. The fit indices suggested good fit (CFI =.99) and the residuals were sufficiently small (RMSEA=.03 [.00 - .07]). The χ^2 value was non-significant (χ^2= 14.7, df = 10, $p = .143$) and the ratio of the χ^2 value to the degrees of freedom in the model was within acceptable range (χ^2/df= 1.47). Overall, these values suggest that the model fits the data adequately.

As shown in Figure 4, after controlling for ethnicity and educational attainment, biological sex was significantly associated with feminine gender role orientation, conformity motives for drinking, and alcohol use behaviors. Specifically, women reported higher feminine orientation than men (unstandardized coefficient = 1.04, $p < .01$). Further, men reported having more conformity motives (unstandardized coefficient = -1.02, $p < .01$) for consuming alcohol than did women. Finally, men endorsed greater alcohol consumption behaviors (unstandardized coefficient = -1.79, $p < .01$) than did women.

After controlling for sex, ethnicity, and educational attainment, masculine gender role orientation was significantly associated with both coping and conformity motives for alcohol consumption. Increases in masculine orientation were significantly associated with decreased coping (unstandardized coefficient = -.18, $p < .05$) and conformity motives (unstandardized coefficient = -.16, $p < .05$) for alcohol consumption. After controlling for covariates, feminine gender role orientation was significantly associated with coping motives (unstandardized coefficient = -.12, $p < .05$) such that increased femininity predicted lower endorsement of consumption for coping motives. Feminine gender role orientation was not associated with conformity (unstandardized coefficient = -.06) motives for consuming alcohol.

As predicted, coping motives were significantly associated with consumption behavior. More frequent coping-motivated drinking was associated with higher levels of alcohol consumption behaviors (unstandardized coefficient = .26, $p < .01$). In contrast, conformity motives were not associated with consumption behavior (unstandardized coefficient = .04).

Gender role orientation served as a mediator in the association between sex and consumption for coping motives (standardized indirect effect coefficient = -.03, $p < .05$). Women were more likely to report a feminine gender orientation and this predicted a decrease in

drinking for coping motives. Coping motives also served as a mediating variable in the association between gender role orientation and consumption behaviors (standardized indirect effect coefficient = -.05, $p < .05$). Decreased identification with either masculinity or femininity, after controlling for sex, was associated with reports of more frequently consuming alcohol for motives related to coping and this was related to increased consumption overall. Thirty-five percent of the variance in alcohol consumption behaviors was accounted for by the variables in the model (i.e., biological sex, gender role orientation, and coping and conformity motives).

Discussion

Considering the increased risk for negative experiences associated with consuming alcohol at high levels and the commonality of consuming alcohol in our culture (NIAAA, 2006), increasing the body of knowledge aimed at explaining mechanistic relationships associated with use may be important for prevention and treatment purposes. With this goal in mind, this two part study sought to explore the impact of certain psychosocial and motivational factors on alcohol use behaviors in adults. Specifically, this study examined the role of gender role orientation as well as coping and conformity motives for consumption in explaining alcohol use behavior. Overall, these studies seem to suggest that low endorsement of traits associated with either masculine or feminine gender role orientation may be related to an increased risk for elevated alcohol consumption behaviors occurring over the last 30 days as well as at a single time point of acute intoxication.

In general, it seems that the proposed mechanisms, gender role orientation and consumption motives, are associated with alcohol use behaviors, albeit in some unexpected ways. Most consistently, these studies suggest that coping motives, but not conformity motives, for consumption are predictable indicators of alcohol use behaviors whether considering motives

for use on the night of consumption, or more general patterns of motives. The idea that coping motives strongly influence momentary and general alcohol use behaviors is consistent with previous literature (Cooper, 1994). Collectively, these studies offer further evidence to support this previous research suggesting that coping motives are important indicators of increased episodic and general consumption habits.

Further, these studies seem to suggest that the influence of gender role orientation within this mechanistic system is important for predicting alcohol use behaviors such that lower endorsement of traits associated with gender roles was associated with increased use. Bem (1981) proposed a model of gender role orientation that includes four types of orientations: masculine and feminine, androgynous, and non-differentiated. These non-differentiated individuals endorse low levels of both the feminine and masculine gender role characteristics. Though the associations between drinking motives and alcohol use with the four types of orientations were not tested in the present study, it may be that individuals that meet criteria for a non-differentiated gender role orientation are at higher risk for increased alcohol use.

The first study, in which participants who had consumed alcohol in a naturalistic setting on the night of participation completed a brief questionnaire before providing a breath sample to determine BrAC, seems to suggest that perceiving oneself as possessing decreased stereotypical femininity and compassion is associated with increased alcohol use while masculinity and competitiveness has little association with use. It seems that those who lack, or tend not to endorse the possession of, femininity or socially positive feminine traits like compassion are likely to consume alcohol to a higher level of intoxication. While low levels of masculinity were not significantly associated with use, this study still offers support for the idea that low-

identifying (i.e., those who do not report identifying with masculine or feminine gender role orientation) individuals might be consuming to higher rates of intoxication.

Important to consider, however, is that participants in the first study were under the influence of alcohol during participation and this may be related to the observed patterns. Viewed alternatively, the results may suggest that those individuals completing the study at higher levels of intoxication rated themselves as lower in traditional femininity simply because they were more intoxicated. Research suggests that individuals under the influence of alcohol often rely on low level thought, or easily available heuristics, when making decisions (Eidelman, Crandall, Goodmand, & Blanchar, 2012) and that the labels "masculinity" and "femininity" serve as gender orientation terms often closely associated with the personal self-schema and biological sex (Spence & Buckner, 2000). It may be that those individuals whose cognitive functioning was burdened to higher degrees by intoxication endorsed traits that were most strongly associated with established schemas related to biological sex. In this mostly male sample the effect seen here may be an artifact of men drinking to higher degrees of intoxication then relying on established heuristics to complete the questionnaire. Further, research suggests that although attitudes often impact subsequent behavior, previous and current behavior may also impact reported attitudes (Bem, 1970). These results may be an artifact of this phenomenon in that individuals who were highly intoxicated rated themselves as highly masculine because they were currently engaging in masculine typed behaviors.

The results of the second study seem to offer additional support for the idea that low identifiers consume alcohol at higher rates and the findings advance our understanding of the role of motives for consumption within this relationship. Here, it seems that decreased masculinity (as measured by both the BSRI and PAQ) and femininity (as measured by the PAQ)

were associated with increased alcohol use behaviors through their association with coping motives. This is consistent with previous research suggesting that drinking motives may be the most proximal predictors of alcohol use and that other variables, like personality factors, may exert their influence through their associations with motives (Cooper, 1994; Cox & Klinger, 1988; and Stewart & Devine, 2000). Though this study did not explicitly classify participants into each of the four gender role orientation categories, findings are not inconsistent with the notion that individuals who may be considered non-differentiated seem to consume alcohol for coping motivations.

It is important to note that the measures used to assess gender role orientation in the present studies define low masculinity as having easily hurt feelings, low self-confidence, and feeling inferior to others and low femininity as being cold in relationships and showing emotional flatness (Spence et al., 1974). Research suggests that certain personality factors, like emotional lability and self-doubt, are often associated with increased alcohol consumption behaviors through a coping motives mechanism (Cooper et al., 2000: Loukas et al., 2000; Stewart & Devine, 2000; and Stewart et al., 2001). It seems that those individuals who are low (or perceive themselves as low) on positive masculine and feminine traits, like self-confidence, independence and social competence, may experience increased negative emotion and increased reliance on alcohol consumption for coping purposes (Loukas et al., 2000). It may be that those individuals endorsing low gender role orientation may also be lacking certain positive traits that might function as or increase the availability of adaptive coping strategies that might take the place of alcohol use. This is consistent with previous research suggesting that individuals who endorse an androgynous gender role orientation, or high levels of the positive traits associated with both gender role orientations, are able to efficiently behaviorally adapt to varied situational

demands and also experience higher levels of mental health while possessing a non-differentiated gender role orientation is associated with certain deficits in behavioral adaptation (Bem, 1981, Lefkowitz & Zeldow, 2006).

Limitations and Future Directions

Study one. This study offered a unique opportunity to assess the motives for consumption of alcohol for the current episode in conjunction with current intoxication allowing for a more precise measurement of the relationship between motives and intoxication. This study was limited; however, by the length of the included measures and the possible influence of current intoxication on this self-report data. A complete picture of gender role orientation is best created by using information from both the BSRI and the PAQ (Choi, 2004; Choi et al., 2007; Peralta, Nofziger & Rickles, 2010). It would be beneficial to include these full measures whenever possible. Additionally, because self-report can be influenced by intoxication level (Eidelman, 2012), this study would be improved by implementing a longitudinal type design in which individuals completed ratings assessing gender role orientation at one time point to be followed by a separate assessment of motives and BrAC during a series of later consumption episodes.

Study two. This study served as a complement to the first by assessing gender role orientation with both measures in a sample of adults who were not under the influence of alcohol. While the measurement of gender role orientation was improved, the self-report nature of the alcohol use variable may have impacted the results of the models. Much research has suggested that men and women metabolize alcohol differently due to biological factors and that women may process and absorb alcohol more quickly than men resulting in increased BrAC for women who consume amounts similar to male counterparts (Fillmore & Jude, 2011; Thomasson,

1995). It is important to consider these differences when conceptualizing alcohol use behaviors as they suggest that measures of true differences should incorporate assessments of consumption frequency, quantity, and related negative consequences as this study did, but should also include more objective measures, like BrAC, that account for biological differences. Measurement of alcohol use behaviors may have also been limited as a result of using the AUDIT-4 instead of the full AUDIT. Although this measure has been shown to discriminate between safe and at risk drinkers in adult populations of men and women (Gual et al., 2002) research using this scale is limited. Further, the truncated nature of the measure may have restricted the possible range of variability seen in alcohol use behaviors limiting variance to be accounted for by the other variables in the system.

General limitations and suggested directions. Gender role orientation is a complex construct based on cultural and social norms. The shifting nature of the construct makes definition and assessment difficult. While the BSRI and PAQ are the most common measures used to assess gender role orientation (Lenney, 1991), they do not provide information that is devoid of problems. As the convergence hypothesis suggests, gender roles and related orientations may have undergone substantial change in the last 40 years but these assessments were created at the beginning of this shift. It could be that these measures represent archaic and outdated formulations of these nebulous constructs. For example, research suggests that some of the items listed on the BSRI scale of femininity may no longer be associated with femininity in our culture and may be considered pejorative (Gill et al., 1987). Future research in this area should focus on updating the operational definitions and available assessments to reflect the current social and cultural atmosphere.

This study suggests that individuals who perceive themselves as possessing low levels of socially desirable gender oriented traits consume more alcohol in a single episode and in general. While analyses of behavior across the four distinctive gender orientation categories (i.e., masculine, feminine, androgynous, and non-differentiated) would add to these findings, this study did not include examination of the androgynous and non-differentiated quadrant directly. The length requirement of the first study made extended assessment of gender role orientation difficult. Although the information was collected in the second study, it was not included in analyses so that results could be generalizable across both studies and to the broader body of literature on this subject. By omitting this information we are unable to clearly see the full picture of interactions within and across gender role orientations. It would be beneficial for future research to test the impact of each of the four distinct orientation types on alcohol use behaviors and consumption motives.

Further, the implications of gender role orientation would be better understood by including measures of negative traits associated with each gender role. Information about the level of positive vs. negative gender oriented traits an individual possesses may make it possible for increased discrimination of risk. As research suggests that increased potentially negative characteristics associated with masculinity (e.g., risk taking behaviors, winning at all costs, and being reluctant to rely on others) are associated with increased use and risk for dependence (Iwamoto, 2011), it would be important to understand whether it is a lack of positive characteristics alone that is associated with risk, or a combination of low positively valued traits and high negatively valued traits that are most indicative of risk. Future research would be benefitted by including measures of negative characteristics like the Conformity to Masculine Norms Inventory (CMNI - 46; Parent & Moraldi, 2009). Relatedly, it seems important to

understand the role of self-esteem when considering these relationships. As the measures used only assess theoretically positive traits, endorsements of low levels of these qualities may be a reflection of low self-esteem, or broader incompetence. In fact, there is limited research that suggests that the masculinity scale of the PAQ does not demonstrate adequate divergence from scales assessing self-esteem suggesting that the two constructs may be very closely related when using these measures (Whitley, 1988). Findings in this study may be reflective of the interaction of overall low levels of self-esteem and positive self-regard and alcohol use behaviors and motives rather than the discrete impact of gender role orientation on those outcome measures.

Additional research suggests that individuals who value inclusion in gender role categories but see themselves as low in related traits may behave in compensatory ways (Schmitt & Branscombe, 2001). Considering the close relationship of alcohol use to masculinity, it may be important to include measures of the importance participants place on exhibiting behaviors consistent with in-group behaviors. It seems that those individuals who perceive themselves as non-differentiated, but also highly value the traits associated with a certain gender role orientation may be at highest risk for increased alcohol use behaviors. Thus, future research should assess both gender role orientation as well as value placed on adhering to traditional gender roles. As such, this study might be benefitted by the inclusion of measures assessing Gender Role Conflict (GRC; O'Neil, 1981), a psychological state in which rigid or overly restrictive socialized gender roles conflict with situational demands and lead to negative consequences for the individual or others with whom they interact. Observed in this study was the possible impact of possessing only few strategies to employ across differing situations and the inability to adapt to situational demands based on a limited repertoire of responses. GRC functions in a similar way in that it serves to confine individuals to stereotypic norms of sex-

typed behavior, disallowing adaptive use of non-congruent behaviors. As GRC has been shown to be related to increased alcohol use as well as specific motives for consumption including this construct in the model may provide further information about the relationships and impactful mechanisms within this system (Blazina & Watson, 1996; Korcuska & Thombs, 2003).

Finally, the sample assessed and design of these studies are somewhat limiting. The sample of individuals in these studies lacked diversity that would increase generalizability of the findings. For example, although the first study adequately reflected the demographic characteristics of the location, the sample was predominantly composed of Caucasian males. The second study was more varied in its representation but was comprised mostly of Caucasian individuals (for a summary refer to Tables 1 and 5). Future research should focus on examining these variables and relationships in minority populations. Additionally, much of the previous research done examining gender role orientation and alcohol use behaviors was executed in a sample of adolescents. The current studies used data only from individuals over the age of 21 and so may not be generalization to younger populations. Each of these studies used self-report surveys that were cross-sectional and a design that was correlational in nature. Because of this limited design lacking temporal ordering or experimental manipulation, causality cannot be implied. Exploring these relationships in a more stringent way, allowing for a more experimental design, would improve our understanding of the systemic implications.

Implications

The convergence hypothesis suggests that as women become more active in the work force (e.g., Bell, Havlicek, and Roncek 1984; Ferrance 1980; Fillmore 1984; Wilsnack and Wilsnack 1978) they will begin to adopt more masculine characteristics. Because the adoption of masculine traits by women has corresponded with increased drinking among women, it was

hypothesized that increased alcohol consumption would be associated with heightened masculinity. The results of this study, rather than suggesting that increased masculine traits in women are related to increased alcohol use, suggest that a decrease in positive feminine traits seems to be related to increased alcohol use. It is unclear whether women are simply leaving positive traits traditionally associated with femininity behind, or if they are also adopting negative traits traditionally associated with masculinity. While the convergence hypothesis suggests adaptation of women by assimilating masculine characteristics, it may also be that they are shedding feminine characteristics. Still unclear is whether or not women are becoming more like men by adopting negative masculine traits or becoming less differentiated by becoming less feminine. Research exploring these relationships in the future should consider this question and consider assessing change in gender role orientation over time in a longitudinal design.

In line with the finding that low masculine and feminine orientations may be associated with increased risk for increased use assessing gender role orientation might be helpful in understanding an individual's personal risk for excessive or problematic use, as well as what motives might be driving them to use. This information could be helpful when formulating case conceptualizations or completing functional analyses of problematic alcohol use.

In sum, it seems that gender role orientation, alcohol consumption motives, and alcohol use behaviors are associated whereby low endorsement of positive masculine or feminine typed traits is associated with increased alcohol use through a coping motives mechanism. While these studies are helpful in elucidating the intricate relationships driving this system, future research is needed to explicate nuances left unclear.

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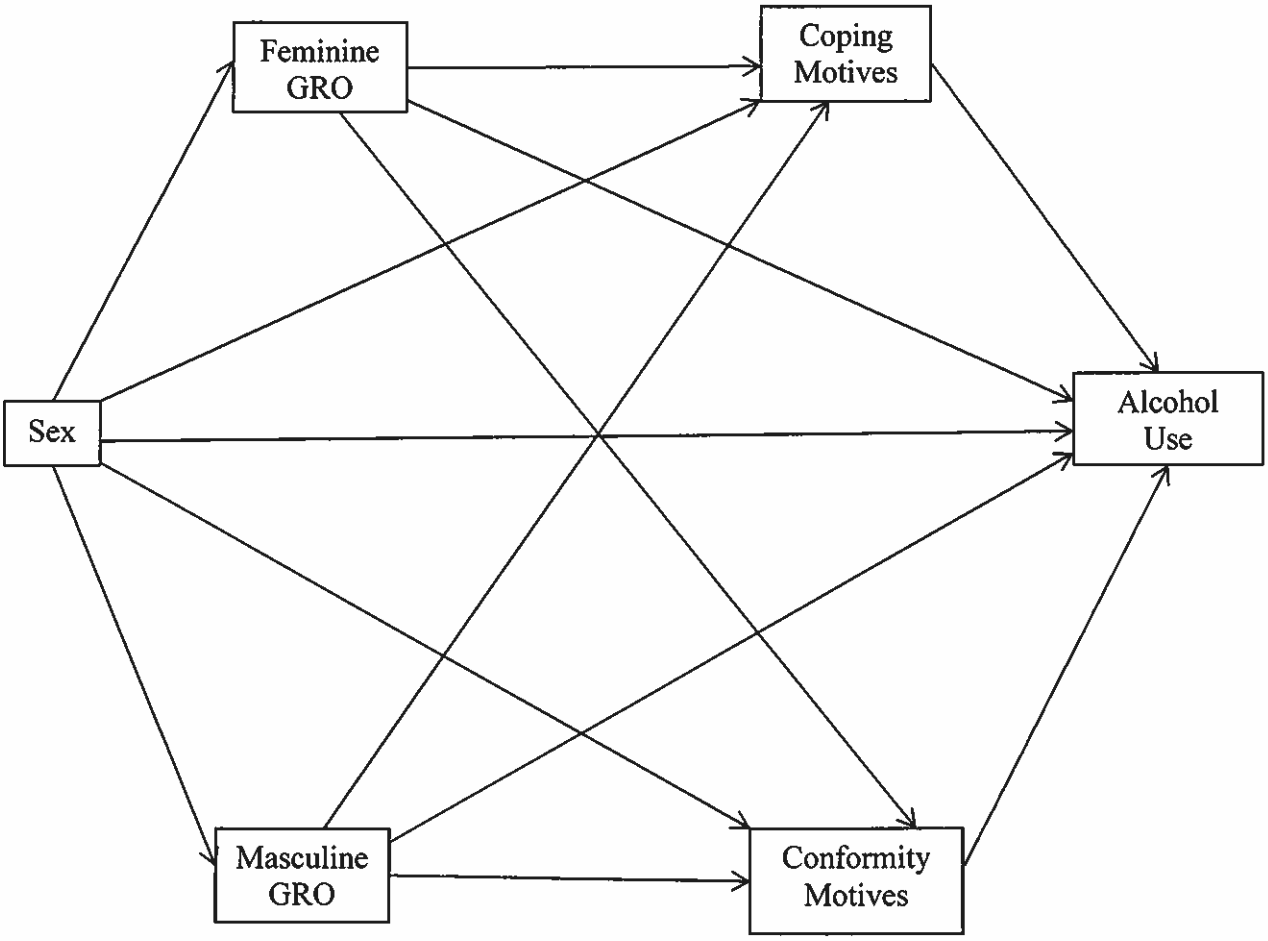
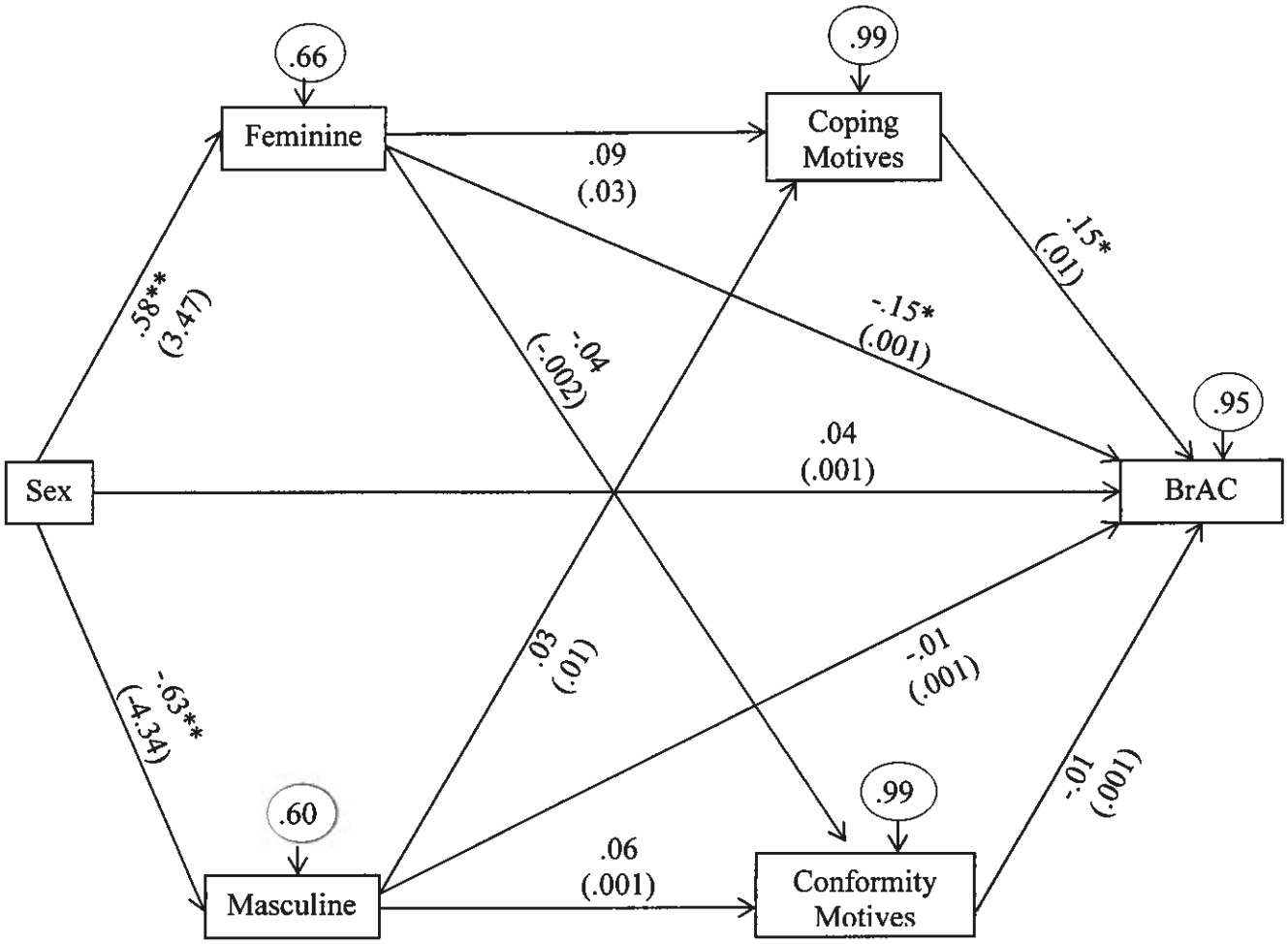
Figure 1. Hypothesized Model



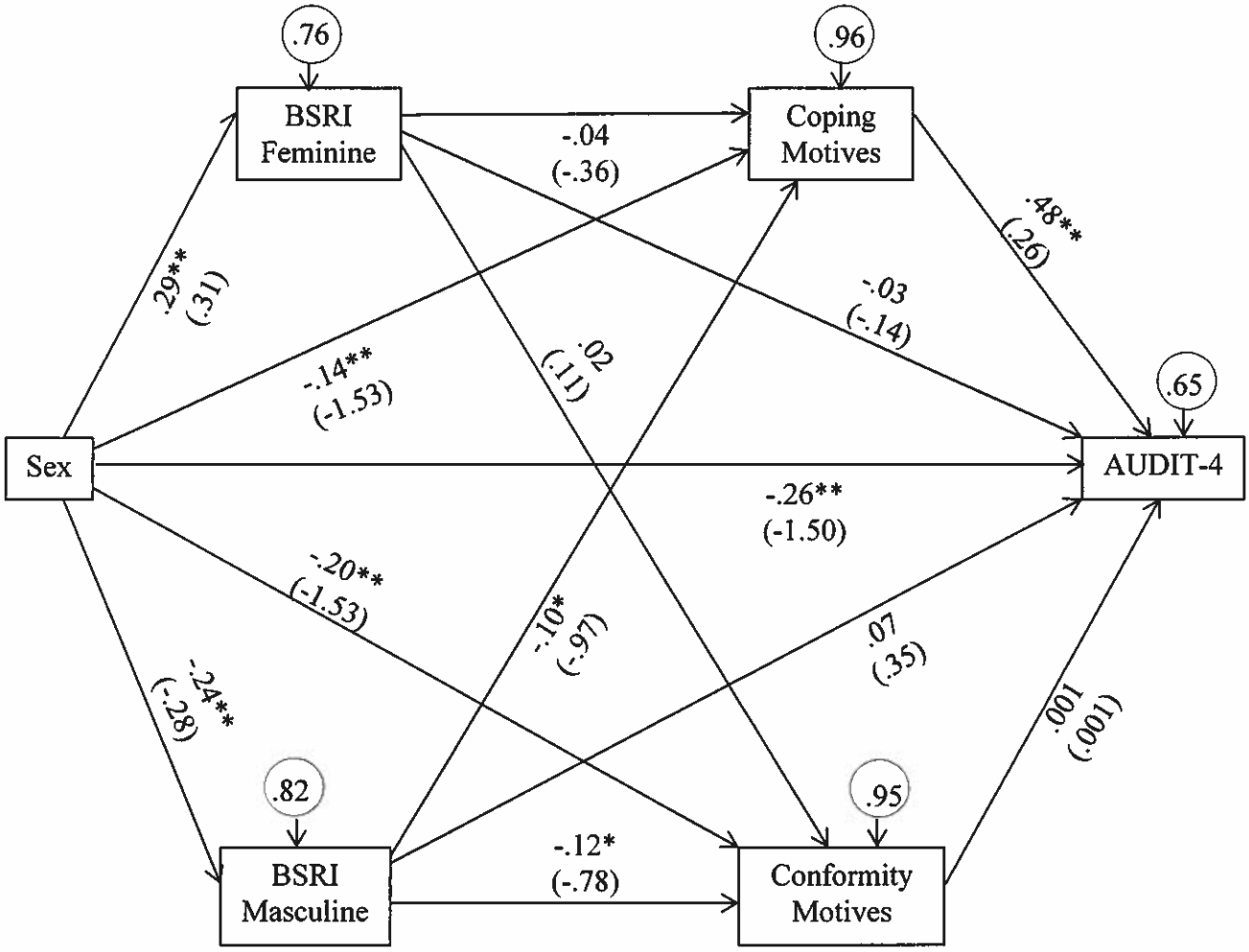
Note: GRO = Gender Role Orientation.

Figure 2. Path Diagram for Study 1



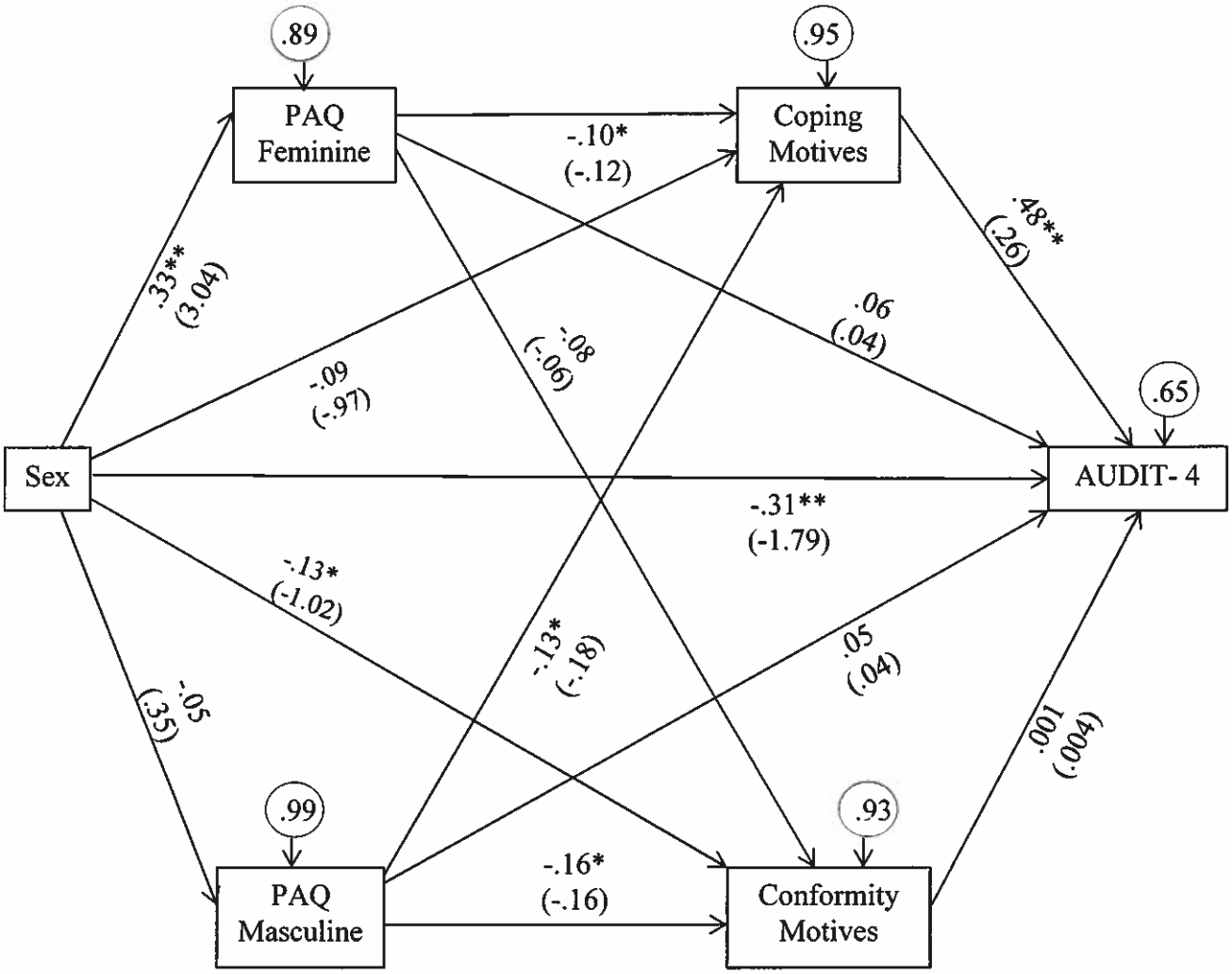
Note: *$p < .05$ (2-tailed). **$p < .01$ (2-tailed). $N = 335$
Error associated with the conformity and coping motives variables were correlated (correlation coefficient = .57)
BrAC = Breath Alcohol Concentration.

Figure 3. Path Diagram for Study 2 using the BSRI



Note: *$p < .05$, **$p < .01$. $N = 426$
Error associated with the conformity and coping motives variables were correlated (correlation coefficient = .37)
BSRI = Bem Sex Role Inventory.
AUDIT-4 = Alcohol Use Disorders Identification Test, 4.

Figure 4. Path Diagram for Study 2 using the PAQ



Note: *$p < .05$, **$p < .01$. $N = 426$

Error terms associated with scales from the same measure were correlated. The error terms associated with the feminine and masculine scales of the Personal Attributes Questionnaire (PAQ) were correlated (coefficient= .23, $p < .01$) as were the error terms associated with the conformity and coping motives of the Drinking Motives Questionnaire- Revised (DMQ-R; coefficient = .36, $p < .01$). AUDIT-4 = Alcohol Use Disorders Identification Test, 4

Table 1
Demographic Information for Study 1

Sex		
Female	127	37%
Male	208	62%
Ethnicity		
African American	12	3.6%
Native American	3	<1%
Arab American	4	1.2%
Asian American	6	1.8%
Caucasian	294	89%
Hispanic/Latino	7	2.1%
Other	3	<1%

Note: $N = 335$.

Table 2

Descriptive Information for Endogenous Variables in Study 1

Variable	Mean	SD	Range
Femininity	8.92	2.93	2 – 14
Masculinity	9.69	3.34	2 – 14
Coping Motives	2.11	.99	1 – 5
Conformity Motives	1.57	.81	1 – 5
BrAC	.063	.049	.000-.227

Note: $N = 335$. BrAC = Breath Alcohol Concentration.

Table 3

Pearson Correlations among Sex, Gender Role Orientation, Motives, and Consumption behaviors

Variable	Sex	Femininity	Masculinity	Conformity Motives	Coping Motives	BrAC
Sex	1	.572**	-.627**	-.120*	-.024	-.045
Femininity		1	-.412**	-.054	.081	-.117*
Masculinity			1	.081	-.008	.037
Conformity Motives				1	569**	.084
Coping Motives				.	1	.133*
BrAC						1

Note: *$p < .05$. **$p < .01$. $N = 335$. BrAC = Breath Alcohol Concentration.

Table 4
Zero-Order Correlations among gender role orientation items

Items	Feminine	Compassionate	Masculine	Competitive
Feminine	1	.23**	-.67**	-.21
Compassionate		1	-.08	.10
Masculine			1	.365**
Competitive				1

Note:*p<.05. **p<.01. $N = 335$.

Table 5
Demographic Information for Study 2

Sex		
Female	252	59%
Male	174	41%
Ethnicity		
African American	26	6%
Asian American	37	9%
Caucasian	331	78%
Hispanic/Latino	15	4%
Native American	5	1%
Pacific Islander	1	<1%
Other	11	3%
Region of Residence		
Midwest	83	20%
Northeast	93	22%
South	137	32%
West	113	27%
Sexual Orientation		
Heterosexual	394	93%
Homosexual	17	4%
Bisexual	13	3%
Other	2	<1%
Marital Status		
Married	160	38%
Single	175	41%
Divorced	31	7%
Widowed	8	2%
Civil Union	4	1%
Cohabitating	48	11%
Education Attainment		
Some High School	1	<1%
High School Degree	53	12%
Some College	110	26%
Two Year College Degree	50	12%
Four Year College Degree	141	33%
Some Graduate Training	16	4%
Graduate Degree	55	13%
Yearly Household Income		
Under 20,000	64	15%

20,000 - 50,000	177	41%
50,000 - 100,000	148	35%
100,000 - 150,000	28	7%
150,000 - 200,000	7	2%
200,000 +	2	<1%

Note: *$p < .05$. **$p < .01$. $N = 426$

Table 6
Descriptive Information for Endogenous Variables in Study 2

	Mean	SD	Actual Range
Femininity			
BSRI	3.31	.52	1.85 - 4.60
PAQ	31.33	4.50	17 – 40
Masculinity			
BSRI	3.31	.57	1.53 – 4.84
PAQ	30	3.73	17 – 39
Conformity Motives	7.52	3.80	5 – 23
Coping Motives	10.93	5.32	5 – 25
AUDIT-4	4.01	2.87	1 – 15

Note: $N = 426$. BSRI = Bem Sex Role Inventory.
PAQ = Personal Attributes Questionnaire.

Table 7
Pearson Correlations among Sex, Gender Role Orientation, Motives, and Consumption behaviors

Variable	Sex	Femininity		Masculinity		Conformity Motives	Coping Motives	AUDIT-4
		BSRI	PAQ	BSRI	PAQ			
Sex	1	.294**	.331**	-.241**	.046	-.166**	-.127**	-.344**
Femininity								
BSRI	-	1	.717**	-.016	.046	-.042	-.077	-.139**
PAQ	-	-	1	.053	.236**	-.159**	.159**	-.104*
Masculinity	-	-	-					
BSRI	-	-	-	1	.618**	-.071	-.071	.098*
PAQ	-	-	-	-	1	-.183**	.151**	-.023
Conformity	-	-	-	-	-	1	.392**	.226**
Coping	-	-	-	-	-	-	1	.508**
AUDIT-4	-	-	-	-	-	-	-	1

Note: *$p < .05$. **$p < .01$. $N = 426$. BSRI = Bem Sex Role Inventory, PAQ = Personal Attributes Questionnaire, AUDIT-4 = Alcohol Use Disorders Identification Test, 4.

Bem Sex Role Inventory

Instructions:
Below is a list of several adjectives which describe various personality characteristics. Please rate yourself on each of these adjectives, along the seven point scale described below.

1	2	3	4	5	6	7
Never or almost never true	Usually not true	Sometimes but infrequently	Occasionally true	Often true	Usually true	Almost always or always true

Please be sure to rate yourself on each of the following adjectives or phrases

Rating	Adjective	Rating	Adjective
____	self-reliant	____	theatrical
____	yielding	____	assertive
____	helpful	____	flatterable
____	defend my beliefs	____	happy
____	cheerful	____	strong personality
____	moody	____	loyal
____	independent	____	unpredictable
____	shy	____	forceful
____	conscientious	____	feminine
____	athletic	____	reliable
____	affectionate	____	analytical
____	sympathetic	____	eager to soothe hurt feelings
____	jealous	____	conceited
____	have leadership abilities	____	dominant
____	sensitive to the needs of others	____	soft-spoken
____	truthful	____	likable
____	understanding	____	warm
____	secretive	____	solemn
____	make decisions easily	____	willing to take a stand
____	compassionate	____	tender
____	sincere	____	friendly
____	self-sufficient	____	aggressive
____	gullible	____	unsystematic
____	inefficient	____	competitive
____	acts as a leader	____	loves children
____	childlike	____	tactful
____	adaptable	____	ambitious
____	individualistic	____	gentle
____	does not use harsh language	____	conventional

Gender Role Endorsement Questionnaire (Study 1)

Please rate your personal identification with the attributes below by circling a number on the scale. Higher values indicate stronger identification with the listed attribute. In other words, please tell us how much these words describe you by circling a number below each word.

1. Compassionate

Does not describe me at all	1	2	3	4	5	6	7	Describes me very well

2. Competitive

Does not describe me at all	1	2	3	4	5	6	7	Describes me very well

3. Feminine

Does not describe me at all	1	2	3	4	5	6	7	Describes me very well

4. Masculine

Does not describe me at all	1	2	3	4	5	6	7	Describes me very well

Personal Attributes Questionnaire

Instructions:

The items below inquire about what kind of person you think you are. Each item consists of a PAIR of characteristics, with the letters 1-5 in between. For example,

Not at all artistic 1.....2.....3.....4.....5 Very artistic

Each pair describes contradictory characteristics - that is, you cannot be both at the same time, such as very artistic and not at all artistic.

The numbers form a scale between the two extremes. You are to choose a number which describes where YOU fall on the scale. For example, if you think that you have no artistic ability, you would choose 1. If you think that you are pretty good, you might choose 4. If you are only medium, you might choose c, and so forth.

1.	Not at all aggressive	1.....2.....3.....4.....5	Very aggressive
2.	Not at all independent	1.....2.....3.....4.....5	Very independent
3.	Not at all emotional	1.....2.....3.....4.....5	Very emotional
4.	Very submissive	1.....2.....3.....4.....5	Very dominant
5.	Not at all excitable in a major crisis	1.....2.....3.....4.....5	Very excitable in a major crisis
6.	Very passive	1.....2.....3.....4.....5	Very active
7.	Not at all able to devote self completely to others	1.....2.....3.....4.....5	Able to devote self completely to others
8.	Very rough	1.....2.....3.....4.....5	Very gentle
9.	Not at all helpful to others	1.....2.....3.....4.....5	Very helpful to others
10.	Not at all competitive	1.....2.....3.....4.....5	Very competitive
11.	Very home oriented	1.....2.....3.....4.....5	Very worldly
12.	Not at all kind	1.....2.....3.....4.....5	Very kind
13.	Indifferent to others approval	1.....2.....3.....4.....5	Highly needful of others' approval
14.	Feelings not easily hurt	1.....2.....3.....4.....5	Feelings easily hurt
15.	Not at all aware of feelings of others	1.....2.....3.....4.....5	Very aware of feelings of others
16.	Makes decisions easily	1.....2.....3.....4.....5	Has difficulty making decisions
17.	Gives up very easily	1.....2.....3.....4.....5	Never gives up easily
18.	Never cries	1.....2.....3.....4.....5	cries very easily
19.	Not at all self-confident	1.....2.....3.....4.....5	Very self-confident
20.	Feels very inferior	1.....2.....3.....4.....5	Feels very superior
21.	Not at all understanding of others	1.....2.....3.....4.....5	Very understanding of others
22.	Very cold in relations with others	1.....2.....3.....4.....5	Very warm in relations with others
23.	Very little need for security	1.....2.....3.....4.....5	Very strong need for security
24.	Goes to pieces under pressure	1.....2.....3.....4.....5	Stands up well under pressure

DMQ-R

Instructions for Study 1: Below is a list of reasons people sometimes give for drinking alcohol. Thinking about your drinking today, to what extent would you say that you drank for each of the following reasons?

Instructions for Study 2: Below is a list of reasons people sometimes give for drinking alcohol. Thinking about your drinking over the previous 30 days, to what extent would you say that you drank for each of the following reasons?

1. To forget your worries

Not at all A little Somewhat Moderately Very much so

2. Because your friends pressure you to drink

Not at all A little Somewhat Moderately Very much so

3. Because it helps you enjoy a party

Not at all A little Somewhat Moderately Very much so

4. Because it helps you when you feel depressed or nervous

Not at all A little Somewhat Moderately Very much so

5. To be sociable

Not at all A little Somewhat Moderately Very much so

6. To cheer up when you are in a bad mood

Not at all A little Somewhat Moderately Very much so

7. Because you like the feeling

Not at all A little Somewhat Moderately Very much so

8. So that others won't kid you about not drinking

Not at all A little Somewhat Moderately Very much so

9. Because it's exciting

Not at all A little Somewhat Moderately Very much so

10. To get high, buzzed, or drunk

Not at all A little Somewhat Moderately Very much so

11. Because it makes social gatherings more fun

Not at all A little Somewhat Moderately Very much so

12. To fit in with a group you like

Not at all A little Somewhat Moderately Very much so

13. Because it gives you a pleasant feeling

Not at all A little Somewhat Moderately Very much so

14. Because it improves parties and celebrations

Not at all A little Somewhat Moderately Very much so

15. Because you feel more self-confident and sure of yourself

Not at all A little Somewhat Moderately Very much so

16. To celebrate a special occasion with friends

Not at all A little Somewhat Moderately Very much so

17. To forget about your problems

Not at all A little Somewhat Moderately Very much so

18. Because it's fun

Not at all A little Somewhat Moderately Very much so

19. To be liked

Not at all A little Somewhat Moderately Very much so

20. So you won't feel left out.

Not at all A little Somewhat Moderately Very much so

AUDIT

The Alcohol Use Disorders Identification Test: Interview Version

Read questions as written. Record answers carefully. Begin the AUDIT by saying "Now I am going to ask you some questions about your use of alcoholic beverages during this past year." Explain what is meant by "alcoholic beverages" by using local examples of beer, wine, vodka, etc. Code answers in terms of "standard drinks". Place the correct answer number in the box at the right.

1. How often do you have a drink containing alcohol?

   (0) Never [Skip to Qs 9-10]
   (1) Monthly or less
   (2) 2 to 4 times a month
   (3) 2 to 3 times a week
   (4) 4 or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

   (0) 1 or 2
   (1) 3 or 4
   (2) 5 or 6
   (3) 7, 8, or 9
   (4) 10 or more

3. How often do you have six or more drinks on one occasion?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

   Skip to Questions 9 and 10 if Total Score for Questions 2 and 3 = 0

4. How often during the last year have you found that you were not able to stop drinking once you had started?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

   (0) No
   (2) Yes, but not in the last year
   (4) Yes, during the last year

10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

    (0) No
    (2) Yes, but not in the last year
    (4) Yes, during the last year

Record total of specific items here

If total is greater than recommended cut-off, consult User's Manual.

AUDIT-4

1. How often do you have a drink containing alcohol?
    (0) Never
    (1) Monthly or less
    (2) 2 to 4 times a month
    (3) 2 to 3 times a week
    (4) 4 or more times a week

2. How many drinks containing alcohol do you have on a typical night when you are drinking?
    (0) 1 or 2
    (1) 3 or 4
    (2) 5 or 6
    (3) 7, 8, or 9
    (4) 10 or more

3. How often do you have 6 or more drinks on one occasion?
    (0) Never
    (1) Less than monthly
    (2) Monthly
    (3) Weekly
    (4) Daily or almost daily

4. Has a relative, friend, doctor, or another health worker been concerned about your drinking or suggested that you cut down?
    (0) No
    (2) Yes, but not in the last year
    (4) Yes, in the last year