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Drunk Personality: Reports from Drinkers and Knowledgeable Informants

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Abstract

Objective—Existing literature supports the Five-Factor Model (FFM) of personality (i.e., Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Intellect or Openness) as a comprehensive representation of stable aspects of mood, affect, and behavior. This study evaluated the FFM as a framework for both self-perceptions of drunkenness (i.e. individual changes in mood, affect, and behavior associated with one's own intoxication), as well "drinking buddies'" perceptions of their friends' drunkenness (i.e., changes in mood, affect, and behavior associated with a friend's intoxication) and the association of reported sober-to-drunk differences with negative alcohol-related consequences.

Method—College-student drinkers (*N = 374* [187 "drinking buddy" pairs]) reported on their sober and drunk levels of the five factors, as well as those of their drinking buddy. Buddies completed parallel assessments for themselves and their friend in order for rater agreement to be determined. All participants completed assessments of harmful alcohol outcomes experienced within the past year.

Results—Regardless of reporter, differences between drunken and sober states were found across all five factors and agreement between self and informant reports was consistently significant and comparable across sober and drunk conditions. Low levels of drunk Conscientiousness and drunk Emotional Stability were associated with experiencing more alcohol-related consequences, even when controlling for sober factor levels and binge drinking frequency.

Conclusions—Findings support the use of the FFM as a clinically relevant framework for organizing differences in personality expression associated with intoxication and the validity of self-reports of drunk personality.

Keywords

Trait expression; Drunkenness; Five-Factor Model; Informant reports; Personality

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The idea that "some people act different" when under the influence of alcohol would appear to be widely accepted by those familiar with inebriety either through direct observation or portrayals in literature or the media. Indeed, Dunn and Goldman (1996) have documented that children as young as ten have developed beliefs about how people behave when they drink, and the nature of those beliefs start out largely negative and grow more positive as they get older. In fact, for many, the nature of these behaviors, and the manner in which they differ from one's typical sober behaviors, is of central importance when determining if a drinker has a "drinking problem." For example, many members of the sober and recovery community (i.e., adhering to the Twelve Step program Alcoholics Anonymous) cite problematic behavior, mood, and attitude *when drinking* as an indication of addiction (Alcoholics Anonymous website: http://www.aa.org/lang/en/subpage.cfm?page=71), highlighting the importance of understanding these differences in a systematic way with a common language, both for treatment seekers as well as providers. Additionally, even drinkers who might not meet diagnosis for an Alcohol Use Disorder (AUD) but who do engage in heavy or binge drinking often display verbal and behavioral patterns when intoxicated that result in harmful outcomes. This underscores the importance of studies that could allow researchers and clinicians to predict these patterns based on information about drinkers' unique sober and drunk personality characteristics.

Though the concept of individual differences in alcohol-induced mood and behavior change has yet to be examined in the context of problem drinkers or those who experience specific alcohol-related consequences, the alcohol research literature is replete with findings documenting the normative diverse effects of intoxication commonly experienced by drinkers in general. For example, early studies have shown that alcohol consumption increases sociability and feelings of happiness (e.g., Abe, 1968; Freed, 1978), with more recent investigations showing increases in the related constructs of stimulation, positive mood, reward, elation, and energy (Peele & Brodsky, 2000; Gilman, Ramchandani, Davis, Bjork, & Hommer, 2008; Ray, MackKillop, Leventhal, & Hutchison, 2009; Wilkie & Stewart, 2005). Additionally, empirical investigations have demonstrated increases in aggressive tendencies (e.g., Giancola, 2002) and decreases in stress reactivity (e.g., Levenson et al., 1980; Ray, MackKillop, Leventhal, & Hutchison, 2009; see Sher & Grekin, 2007 for review) and behavioral inhibition (e.g., de Wit et al., 2000; Miller, Hays, & Fillmore, 2012; Reynolds, Richards, & de Wit, 2006) with acute intoxication. Levels of creativity have been shown to both increase (Jarosz et al., 2012) and decrease (Lang et al., 1984) with alcohol consumption. Despite the abundance of evidence that alcohol affects many aspects of a drinker's mood, affect, and behavior, researchers (Winograd et al., 2012) have only recently begun to describe these effects within a single organizational framework, specifically, the Five-Factor Model of personality (FFM; Costa and McCrae, 1987; Goldberg, 1992). Indeed, this comprehensive approach is well-suited for capturing the wide range of effects experienced and behaviors exhibited by drinkers under the influence of alcohol, often referred to as "drunken comportment" (MacAndrew and Edgerton, 1969).

This conceptualization of intoxication-related changes in personality could also be compared to the pathophysiological effects of major depression on personality. Specifically, studies have found that individuals experiencing an acute depressive episode report higher levels of

neuroticism (i.e., less emotional stability), and lower levels of openness, conscientiousness, and extraversion during the episode than they do after treatment (e.g., Costa, Bagby, Herbst, & McCrae, 2005). Moreover, this study examined the reliability of self-reports of depressed patients and found that retest reports among treatment non-responders were highly correlated, providing evidence for the consistency of self-reports during an acute episode reflective of, presumably, biologically induced changes in personality traits (Costa et al., 2005), rather than a state-dependent reporting bias or distortion (Akiskal, Hirschfeld, & Yerevanian, 1983). This notion, that a physiologically or biologically-based condition can result in reliable and stable differences in one's "normal" personality is analogous to our conceptualization of "drunk personality." Indeed, there are a wide range of neurochemical effects of acute alcohol intoxication on neurocircuitry associated with basic motivational systems (e.g., Koob & Le Moal, 2008; Marinkovic, Rickenbacher, Azma, & Artsy, 2012), and it is therefore likely that these effects would result in measurable differences in reported personality that are consistent across occasions of drunkenness.

Although many researchers have traditionally viewed personality as a stable and enduring construct, consistent within people over time (e.g., Costa and McCrae, 1987), other experts have found that it is highly dependent on situational features, like one's environment, social role, and time of day (Mischel and Peake, 1983; Fleeson, 2001). Therefore, our use of the word "personality" in this manuscript refers not to the conventional construct that is stable in people across time, but to situation-specific manifestations of personality traits that are expressed to different degrees within the same person across different contexts. Indeed, personality theorists have found that there is only modest consistency of behavior of a given individual across different situations, whereas there is relative stability and consistency within similar situations, resulting in individuals having stable situation-behavior profiles that demonstrate a large amount of variability based on the many factors present in a given situation (e.g., Mischel, 1968) - essentially meaning that people posses latent traits of personality characteristics that are expressed differentially depending on the context. For the purposes of this study, one's typical state of drunkenness is conceived as a situation unique from one's typical state of sobriety, and therefore the reported expressed amounts of various personality traits across these contexts are expected to differ. However, given that individuals may frequently drink in similar situations (e.g., at the same bar, with the same people), it is possible that some amount of the reported personality differences across typical sober and drunken states could be attributed to this type of domain specificity or shared alcohol outcome expectancies (i.e., what people think happens as a result of drinking) resulting from drinking experiences shared in common, in addition to individual differences in neurochemical and pharmacological effects resulting from acute alcohol consumption and resulting intoxication. Indeed, any attempt to parcel these contributions would require an experimental approach in which alcohol dosing parameters were systematically varied and personality changes were assessed objectively by raters blind to knowledge of the drinker's drinking history and typical behavior. Such research is challenging in that an attempt to maintain ecological validity of drinking context would involve a host of considerations ranging from setting, drinking companions, and conditions antecedent to the drinking occasion. However, such research is clearly indicated if we are to validly apportion the sources of variance in alcohol- related changes in personality.

Importance of informant ratings

In order to accurately capture how drinkers differ in the expression of personality traits when intoxicated, it is important to assess more than self-reported perceptions. Beyond the normal self-serving biases and nonmotivated cognitive errors (Miller and Ross, 1975) that might lead to inaccurate reports, there are additional reasons to question the validity of drinkers' self- reports of their intoxicated thoughts, emotions, and behaviors. For example, alcohol can affect self-perception by disrupting cognitive processes necessary for the encoding of self-relevant information (e.g., Hull, 1981). Although drinking companions' perceptions of others' drunken behavior could also be affected by alcohol, these potential inaccuracies would likely be different from the inaccuracies or biases generated by self-report, and therefore contribute valuable information about possible systematic informant-based differences. Additionally, even if both reports are flawed, having two sources instead of one increases the likelihood of convergence on the "true" level of a trait. Therefore, even though they do not necessarily provide *more accurate* information than self reports, informant reports from "drinking buddies" provide their own useful information and represent a crucial external criterion for validating self-reports of drunk personality expression.

Studies of self and other agreement on personality ratings (including FFM ratings) are common in psychological literature (e.g., John and Robins, 1993; Oltmanns and Turkheimer, 2006; Shrauger and Schoeneman, 1979; Watson and Clark, 1991), and tend to find low (Shrauger and Schoeneman, 1979) to moderate (Costa and McCrae, 1987) levels of agreement. However, we are not aware of studies of self and other agreement regarding personality across both sober and *drunk* states. It is possible that agreement regarding intoxicated states may be lower, due to potentially impaired recall and judgment. However, in order to establish the FFM as a framework for characterizing reported sober-to-drunk differences, it is important that self- reports of one's own drunk factor levels is associated with ratings by knowledgeable observers; otherwise the validity of self-reports would be in question. However, if the reports display significant agreement, that would provide evidence for consistency across informants, indicating the presence of valid state-like constructs.

The primary goal of this study is to replicate and build upon our previous work on self-perceived drunkenness (Winograd, et al., 2012). This exploratory study was designed to assess whether drunken personality expression could be measured using the FFM, as is sober personality expression. Additionally, we were interested in describing the normative changes (i.e., mean-level differences between reported sober and drunk levels) for each of the five factors. Using reports from over 1,000 undergraduates at a large, Midwestern university, confirmatory factor analysis procedures (derived and replicated on different subsamples) suggested the FFM could be applied to descriptions of "one's typical drunken state" as well as it can be to "one's typical sober state." Regarding perceived differences in sober and drunk personality, self-reports of Extraversion displayed a normative increase as a result of intoxication, while (in order of effect size) Conscientiousness, Intellect, Agreeableness, and Neuroticism were all perceived to significantly decrease. Though this study was crucial in establishing the FFM as a framework for broadly characterizing alcohol's acute effects, due to the self-report nature of the study it is difficult to rule out the

potential effects of reporting biases, recall difficulties, or individually held alcohol expectancies on the obtained results.

The present study builds upon our earlier findings through addressing such possible self-report biases, as well as increasing the clinical relevance of the concept and improving other aspects of methodology. Specifically, assessment of alcohol consequences and the use of a standardized FFM measure, in addition to the incorporation of informant reports from "drinking buddies," build upon the previous study and allow the following questions to be addressed: How do each of the five factors differ between sober and drunken states (specifically, can the original pattern of reported sober-to-drunk differences be replicated)? How much do friends who drink together agree regarding one another's sober and drunk personalities? Last, are reports of sober and drunk factor levels associated with individuals' experience of negative alcohol-related consequences? That is, do intoxication-related changes in personality expression have clinical importance as evidenced by association with alcohol-related problems?

Methods

Participants and Procedure

Participants were 374 undergraduates (187 "drinking buddy" pairs [60 same-sex male; 90 same-sex female; 34 opposite-sex; three pairs contained one or more missing reports of sex]; mean age = 18.4 (SD =.74), 57% female, 84% White) at a large, Midwestern university. After receiving study approval from the institutional review board, target participants (i.e., not the "drinking buddies") were recruited based on their response on a mass pre-test for an introductory psychology course (i.e., all participants who reported having a "drinking buddy" in the area who "knows what [they] are like when both sober and drunk" were emailed and asked to participate). Recruited (target) participants were asked to come to the laboratory with their "drinking buddy," where they provided informed consent and were placed in separate rooms to complete a 40- minute survey. The questions assessed demographic characteristics, alcohol consumption patterns and alcohol-related consequences, and levels of sober and drunk factors. Student participants who were enrolled in Introductory Psychology were compensated with course credit, and all others were compensated with $25 gift certificates for an online retail vendor. Data were collected in two consecutive semesters (Fall and Spring), and among participants in the second semester of data collection, buddy pairs reported knowing each other, on average, for a period of one to two years, socializing with them (while sober) between three and five times each week on average, and drinking together an average of two to four times each month. (Note that these questions on familiarity were only available for those in the second semester of data collection [n = 194], and therefore it is possible that participants in the first [Fall] semester would not be as familiar with each other because they have had less time together in college.)

Measures

Alcohol Consumption—Binge drinking status was assessed using the item "In the past 30 days, how many times have you had *five or more* drinks at a single sitting?" This item

was included based on findings that drinking five or more drinks in a sitting is significantly related to experiencing more alcohol-related harm, such as traffic fatalities (Yi et al., 2004), unsafe sexual activity, interpersonal problems, and other negative consequences (Wechsler et al., 1994). This variable was trichotomized based on guidelines from the Substance Abuse and Mental Health Services Administration (2004). Responses of "Never" were coded "0" (i.e., non-bingers), 1–3 times per month was coded as "1" (i.e., episodic bingers), and once a week or more was coded as "2" (i.e., heavy bingers).

Alcohol-related Consequences—Consequences were measured through the Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut and Sher, 1992), which assesses alcohol-related harms experienced during the past year. This measure was developed for use in college students and contains items specifically associated with misuse in this population (e.g., receiving a lower grade on an exam or paper because of your drinking; engaging in regrettable sexual situations; getting into physical fights when drinking) as well as items generally used to assess for AUD status and indicative of some degree of abuse or dependence (e.g., having the "shakes" after stopping or cutting down; wanting a drink first thing in the morning; having been fired from a job or suspended from school because of drinking). Responses were on a 5-point scale ("No, never," "Yes, but not in the past year," "1 time in the past year," "2 times in the past year," and "3+ times in the past year"), but were dichotomized based on experience within the past year (0 = Not experienced within the past year; 1 = Experienced at least once within the past year). Analyses were conducted based on all consequence items (i.e., 27 items, $\alpha = .80$), with the total consequence variable representing the mean of participants' responses to all 27 items (note: nine participants who did not respond to five items or more were coded as "missing" for the total consequence variable).

Five-Factor Levels—The state-like expression of sober and drunk personality was assessed using a 50-item scale from Goldberg's International Personality Item Pool (IPIP; publically available at http://ipip.ori.org/New_IPIP-50-item-scale.htm [Goldberg, 1999]). Participants completed four versions, each containing ten items reflective of each of the five factors: regarding their own trait expressions when sober (coefficient alphas: Extraversion (E) = .92; Agreeableness (A) = .86; Conscientiousness (C) = .85; Emotional Stability (ES) = .87; Intellect (I) = .80), regarding their own trait expressions when drunk (alphas: E = .87; A = .78; C = .83; ES = .82; I = .82), regarding their buddy's trait expressions when sober (alphas: E = .91; A = .87; C = .87; ES = .88; I = .83), and regarding their buddy's trait expressions when drunk (alphas: E = .90; A = .84; C = .81; ES = .88; I = .81). Response options were on a 5-point Likert scale and ranged from "Very Inaccurate" to "Very Accurate." One's value of each scale (e.g., Self-reported Sober Extraversion, Informant-reported Drunk Agreeableness) was determined by the mean of all ten items, and those who were missing on three or more on a particular scale were coded as "missing" for that scale. This scale was selected because of its public accessibility, relatively low burden (given that participants were asked to complete it four times), and comprehensive coverage of the five factors. Items that may have initially appeared very "trait-like" or not applicable to intoxicated states (e.g., "Gets chores done right away" or "Am exacting at my work") were

retained in effort to maintain the original scale and avoid "cherry picking." (It should also be noted that the factor of Emotional Stability is construed as the inverse of Neuroticism.)

Research Questions and Analytic Strategy

The purpose of this study was to address three central questions: 1) Can the pattern of reported five-factor, sober-to-drunk differences from Winograd et al. (2012) be replicated? 2) Do participants see their own sober and drunk selves similarly to how others see them? And 3) Do sober or drunk factor levels predict experiencing alcohol-related consequences?

These questions were addressed using analytic techniques that account for the nested structure of the data (i.e., each participant is a member of dyad and thus are not independent from one another). Intraclass Correlation Coefficients (ICCs) for dyadic data (Kenny et al., 2006) were used to assess agreement between target and informant reports. Hierarchical linear modeling (see Snijders and Bosker, 2011) was used to predict the likelihood of consequences from five-factor scores, as well as assess the effects of rater and sober and drunk conditions on factor levels.

Results

Preliminary Analyses

Binge drinking patterns among the main participants (targets) and their "drinking buddies" were comparable, with 17% of targets reportedly being "non bingers," 38% "episodic heavy drinkers," and 44% "frequent heavy drinkers." Among the "drinking buddies," the figures were 12%, 34%, and 54%, respectively. (Please note that the labels "targets" and "drinking buddies" is for ease of explanation only – members of these dyads are in fact indistinguishable [Kenny et al., 2006] and are thus treated as interchangeable in analyses reported below). For reference, these binge drinking figures are comparable to those found in a large college student sample from the same university, in which student drinkers averaged between one and three instances of 5+ drinking within the previous 30 days (Sher and Rutledge, 2007). Reported frequency of bingeing was similar among "drinking buddy" pairs (ICC = .40, p <.0001), as were endorsement rates of alcohol-related consequences (ICC = .36, p <.0001). On average, targets and buddies reported experiencing between six and seven types of consequences (targets = 6.59, SD = 3.93, drinking buddies = 6.59, SD = 3.73) within the year prior to the study. These findings suggest the pairs share similar drinking patterns and consequences, providing validation of their "drinking buddy" status.

Table 1 displays the correlations (accounting for clustering using the "Cluster ID" command in Mplus [Muthén & Muthén, 1998–2010]) among sex, binge drinking, mean number of alcohol consequences, and self-reported sober and drunk personality variables. Women reported higher levels of Extraversion (sober and drunk) and Agreeableness (sober and drunk), whereas men reported higher levels of Emotional Stability (sober and drunk) and Intellect (sober and drunk). Frequent binge drinking was associated with being lower in Agreeableness (drunk). Additionally, Extraversion (sober and drunk) was positively associated with more frequent binge drinking, drunk Extraversion and lack of Emotional

Stability were associated with more negative consequences, and Conscientiousness (sober and drunk) was associated with less binge drinking and fewer consequences.

Table 2 displays correlations among sex, binge drinking, and self-reported sober-to-drunk *differences* in each of the five factors. Differences in Extraversion were negatively associated with differences in Conscientiousness and positively associated with differences in Emotional Stability. Differences in Agreeableness were positively associated with differences in Conscientiousness, and differences in Conscientiousness were positively associated with differences in Intellect. (Note that a positive association implies that reported sober vs. drunk difference in one factor is associated with a sober vs. drunk difference in another factor in the same direction. In contrast, a negative association implies that reported sober vs. drunk differences in the two factors tended to be in opposite directions [i.e., levels of one factor reportedly increase with intoxication and levels of the other reportedly decrease]). Sex was not associated with magnitude of reported sober-to-drunk differences, though binge drinking was associated with differences in Agreeableness, such that more frequent binge drinkers tended to report greater decreases in Agreeableness with intoxication.

Self – Informant Agreement

To assess self and informant agreement, intraclass correlation coefficients (ICCs) for dyadic data (Kenny et al., 2006) were computed (see Table 3). In these analyses, agreement between a target's self-rating of a given state under a specific condition (e.g., Extraversion-sober) and the buddy's rating *of the target* on the same state and condition were estimated. All ten of the agreement ICCs were significant, and ranged from .15 to .47. For sober states, self and "buddy" informants agreed the most on Conscientiousness. For drunken states, Emotional Stability displayed the highest rater agreement. Though level of agreement varied somewhat across reports of sober and drunk states, the ICCs of four of the five factors did not differ significantly across conditions and were of a generally similar magnitude.1 This was determined through five tests of the non-overlapping dependent correlations (Raghunathan, Rosenthal, & Rubin, 1996) - for example, comparing self-other agreement of Sober Extraversion to self-other agreement of Drunk Extraversion. Conscientiousness was the only exception, with agreement being higher for reports of sober states being somewhat higher than drunk states (ICCsober = .46; ICCdrunk = .30; $Z = 2.50$, $p < .05$).

Reports of Sober-to-Drunk Personality Differences

A multilevel approach was necessary due to the clustered structure of the data (i.e., two friends clustered within a dyad), and thus, the violation of the assumption of independent observations. By accounting for non-independence through a hierarchical model, the effects of variables at different levels (i.e., dyad, individual, and specific variable levels) are combined, while the interdependence among within-dyad observations is accounted for by more accurate estimates of standard errors than would be obtained through conventional ordinary least squares methods. Additionally, because each factor scale likely possesses a different error structure, we accounted for this in the model by allowing their variances to vary.

To assess overall patterns of reported sober-to-drunk differences and test for moderating influences of Rater (i.e., target reporting on self vs. buddy reporting on target), Condition (i.e., sober vs. drunk), and Scale (i.e., each of the five factors), an omnibus, three-level hierarchical model was estimated. In this model, interactions between all Level 1 design variables (i.e., Rater, Condition, and Scale) were modeled and the Level 2 variables of Sex and Binge Drinking Status were included as covariates but not modeled in interaction with the design variables (i.e., we did not consider cross-level interactions). Due to the interaction of multiple variables with Scale (which are the organizing units of study), this omnibus analysis was followed by five hierarchical models, one for each factor.

Overall Model

The overall model consisted of three levels: Level 1 (time varying individual variables), with Scale (e.g., Extraversion, Agreeableness), Condition (i.e., sober or drunk), and Rater (i.e., who is doing the rating of the target, the self or the "buddy" informant); Level 2 (controlling baseline individual variables), with Sex and Binge Drinking Status; and Level 3 (dyad), with the identification number of each dyad. The initial model controlled for Sex and Binge Drinking Status and tested the main effects of Scale, Rater, and Condition, three two-way interactions (Rater by Condition, Scale by Rater, and Scale by Condition), and one three-way interaction (Scale by Rater by Condition)2. The three-way interaction was not significant ($F(4,6528) = 1.12$, $p = .35$), so the final model depicts all main effects and two-way interactions. The two interactions involving Scale were significant; Scale by Rater ($F(4,6532) = 18.11$, $p < .0001$), and Scale by Condition ($F(4,6532) = 187.89$, $p < .0001$), as was the Rater by Condition interaction ($F(1, 6532) = 4.87$, $p = .03$). (See Figure 1 for the distributions of all five factors by condition and raters.)

Factor-Scale-Specific models

Five individual models, with each Scale as the dependent variable, were subsequently run to examine Rater and Condition differences within each factor. During this stage of the sequential modeling process, Binge Drinking Status and Sex remained in the models as control variables.

Extraversion—Main effects for Condition ($F(1,722) = 344.52$, $p < .0001$) and Rater ($F(1,542) = 13.31$, $p < .001$), and Condition by Rater interaction ($F(1,722) = 12.32$, $p < .001$) indicated that although drunkenness was associated with higher Extraversion by both self (*Mdrunk = 3.83, SE = .05; Msober = 3.30, SE = .05;* $p < .0001$) and informant reports (*Mdrunk* = 3.91, *SE* = .05; *Msober* = 3.55, *SE* = .05; $p < .0001$), the magnitude of the difference was greater in self- reports than in informant reports.

Agreeableness—The Agreeableness model indicated a main effect of Condition ($F(1,722) = 152.58$, $p < .0001$), such that sober Agreeableness (*M* =3.93, *SE* = .03) was significantly higher than drunk Agreeableness (*M* = 3.69, *SE* = .03) across reporters. Additionally, a main effect of Rater ($F(1,542) = 25.59$, $p < .0001$) indicated that individuals tend to self-report higher levels of Agreeableness than their buddies report about them (*Mself* = 3.90, *SE=.04* and *Minformant* = 3.72, *SE =.04*, respectively) across conditions.

Conscientiousness—With regard to Conscientiousness, a main effect of Condition ($F(1,722) = 725.54$, $p<.0001$) indicated that levels are reportedly higher when sober (M = 3.66; SE = .04) than drunk (M = 2.96; SE = .04) across raters. Additionally, a main effect of Rater ($F(1,542) = 4.29$, $p<.05$) indicated that levels of this factor are higher when self-reported (M =3.35; SE =.04) than when informant-reported (M = 3.27; SE= .04) across conditions.

Emotional Stability—A main effect of Condition (F(1, 721) = 16.62, p <.0001) and a Condition by Rater interaction (F(1, 721) = 4.99, p < .05) indicated that Emotional Stability is reportedly higher when drunk (M = 3.54; SE = .04) than sober (M = 3.44; SE = .04), and that informant reports of Emotional Stability are higher than self-reports for the sober condition only ($M_{sober,self}$ = 3.38, SE = .05; $M_{sober,informant}$ = 3.50, SE =.05; $M_{drunk,self}$ = 3.54, SE = .05; $M_{drunk,informant}$ = 3.54, SE = .05), making the magnitude of reported sober-to-drunk state differences larger for self-reports than informant-reports.

Intellect—For Intellect there was a main effect of Condition ($F(1,721) = 751.59$, p <.0001), with participants reporting higher sober levels (M = 3.84; SE = .03) than drunk (M = 3.25; SE= .03) across Raters. A main effect of Rater ($F(1,542) = 14.70$, p <.0001) was also found, with individuals self-reporting higher levels of Intellect (M = 3.61; SE = .03) than their buddies reported about them (M = 3.48; SE = .03).

Alcohol-related Consequences

Experience of past-year alcohol-related consequences was predicted using the same hierarchical structure described above. The model included the following predictor variables: sober and drunk levels of each of the five factors, Sex, and Binge Drinking Frequency. The results (see Table 4) indicated that consequences were predicted by binge drinking frequency3 with episodic binge drinkers (b = 1.56, p < .01) and heavy binge drinkers (b = 4.18, p < .0001) being more likely to experience consequences than those who never binge. To further examine the nature of the relationship between binge drinking and consequences, polynomial contrasts were estimated to determine whether the association was linear or quadratic. The results indicated the association to be predominantly linear (Linear: F (1, 162) = 55.73, p < .0001; Quadratic: F (1, 162) =1.93, p = .17). Additionally, low levels of drunk Conscientiousness (b = −.88, p <.05) and low levels of drunk Emotional Stability (b = −.77, p <.05) were associated with reports of more frequent alcohol-related harms. Additionally, low levels of drunk Conscientiousness (b = −.88, p <.05) and low levels of drunk Emotional Stability (b = −.77, p <.05) were associated with reports of more frequent alcohol-related harms.

Discussion

Although the notion that some individuals exhibit marked differences when drunk is pervasive across cultures among drinkers and non-drinkers (as discussed by MacAndrew and Edgerton, 1969), scientific research has not addressed this issue systematically, such as through the comprehensive framework of the FFM. Though we are not claiming that intoxication leads to immediate personality change, per se, these findings do suggest that

levels of the five factors, which are used to measure personality, are significantly different depending on whether participants were instructed to make ratings based on sober or drunk contexts. Therefore, at a normative level, the state of drunkenness can be said to be indexed by increased Extraversion and decreased Neuroticism, Agreeableness, Conscientiousness, and Intellect. The reported intoxication-related increase in Extraversion is consistent with research demonstrating increased sociability (Abe, 1968), feelings of happiness (Freed, 1978), and overall positive mood, elation, and energy (Ray, MackKillop, Leventhal, & Hutchison, 2009). In contrast, drunk decreases in Conscientiousness likely reflect lowered levels of self-control and possibly impaired planning/deliberation. It should be noted that our assessment strategy did not allow us to resolve, with any precision, whether some facets of Conscientiousness were more affected than others. However, impaired self-control/ disinhibition is generally considered a reliable facet of both conscientiousness and impulsivity, which is itself a multidimensional construct (see Dick et al., 2010 for review). Indeed, different facets of impulsivity are found to load on different factors of the FFM (e.g., Whiteside & Lynam, 2001) with some loading on Conscientiousness (e.g., lack of premeditation) but others loading on Extraversion (e.g., sensation seeking) or Neuroticism/ Emotional Stability (e.g., urgency). Moreover, traits related to impaired control have been consistently found in laboratory alcohol administration studies (de Wit et al., 2000; Miller, Hays, & Fillmore, 2012; Reynolds, Richards, & de Wit, 2006), although it should be noted that laboratory and self-report measures often show minimal association (Reynolds, Ortengren, Richards, & de Wit, 2006). Lower reported levels of Agreeableness could lead to intoxicated displays of aggression, though such displays could also result from lowered Conscientiousness. For example, Giancola and colleagues have found that alcohol-related aggression is most likely to occur when there is both provocation and when the drinker manifests traits associated with impaired control such as poor executive function (Giancola, 2000) as well as traits associated with low levels of agreeableness such as aggressivity (Miller, Parrot, & Giancola, 2009) and low empathy (Giancola, 2003). Regarding Emotional Stability, a significant perceived increase with intoxication is consistent with existing research that highlights the stress- dampening and anxiolytic effects of alcohol (Sher and Grekin, 2007). Additionally, lower levels of perceived intellect when drunk is consistent with most peoples' impression of drunken behavior, as well as with literature on impaired verbal fluency and planning associated with alcohol intoxication (e.g., Peterson et al., 1990) and processes related to creativity (Lang et al., 1984).

The idea that there might be predictable, physiologically-induced changes in personality can be found in the research literature on effects of depression on personality (Hirschfeld, Klerman, Clayton, & Keller, 1983). Though researchers have already demonstrated reliable and stable differences in personality traits between individuals during and after acute depressive episodes (e.g., Costa et al., 2005), this type of presumed (at least in part) physiologically-induced personality change has only recently been extended to states of alcohol intoxication where we demonstrated a characteristic pattern of self-reported personality change associated with one's "typical" intoxication. However, the earlier findings by Winograd et al (2012) were based on a nonstandard measure of the five factors and relied solely on self reports, limiting their generalizability and providing a need for replication using enhanced measures and methodology.

Self-Other Agreement in Describing Sober and Drunk States

There was significant agreement between drinking buddies on all ten measures (each of the five factors, both sober and drunk conditions). It could be argued that the most notable finding was the similar level of self-buddy agreement regarding sober and drunk factors, which suggests that participants are "just as good" at describing someone's drunk characteristics as they are at describing someone's sober characteristics. The mean levels of agreement were ICCs of .34 (sober) and .29 (drunk), which are comparable to the moderate agreement statistics found in personality research (e.g., Oltmanns and Turkheimer, 2006). Though the amount of self- informant agreement was consistent across reports of sober and drunk conditions, the magnitude of agreement was not large. Therefore, rather than being "just as good" at judging personality states across sober and drunk conditions, people are, more accurately, "just as adequate."

Exemplifying the differences in reporting were the main effects of informant in the univariate models regarding Agreeableness, Conscientiousness, and Intellect, with self-reports higher than informant reports and across sober and drunk conditions. These effects suggest that this college sample may have a more benign view of themselves than others have of them regarding these factors, which is consistent with literature on self-enhancement and the nature of people to demonstrate a "self-other bias" such that they are more likely to attribute positive traits and characteristics to themselves than others (Brown, 1986). However, these differences have been shown to be small in magnitude and to significantly reduce or disappear when a specific person is used as the "other" (Alicke et al., 1995). Indeed, regarding Extraversion and Emotional Stability, moderated informant by condition effects indicated that informant ratings (of sober states) were actually higher than self ratings. These findings run counter to the notion of self- enhancement but are in line with studies showing the opposite - that Big Five descriptions by informants who were selected by the target are actually more favorable than self-reports (Allik et al., 2010). This suggests that this area needs further study to clarify the associations among informant reports and measures of the Big Five.

Sober and Drunk Personality and Alcohol Consequences

The model predicting the experience of negative consequences suggests that more frequent binge drinking and lower levels of exhibited drunk Conscientiousness and drunk Emotional Stability may influence the rate of experienced alcohol-related harms. The model predicting the experience of negative consequences suggests that more frequent binge drinking and lower levels of exhibited drunk Conscientiousness and drunk Emotional Stability may influence the rate of experienced alcohol-related harms. As noted by Cleckley (1955), the psychopath is characterized by "fantastic and uninviting behavior with drink *and sometimes without* [emphasis added]." That is, the sober personality of the psychopath is already extreme and alcohol adds fuel to the underlying unpleasantness and deviance. It should be noted that although prevalence rates of psychopathy are very low in the general population (between .6% and 2.3% depending on the cutoff score used; Coid, Yang, Ullrich, Robers, & Hare, 2009), drinkers from a general non-clinical population also display traits of impulsivity and hostility when drinking, as demonstrated through laboratory alcohol administration studies as well as self- report measures (e.g., Giancola, 2002; Reynolds,

Richards, & de Wit, 2006). These displays undoubtedly lead to their own forms of "uninviting behavior," albeit (and fortunately) not as extreme as seen in psychopathy. Indeed, traits related to psychopathy are likely continuously distributed in the general population and we believe there is a continuum of liability to the type of disinhibition discussed here. However, these findings demonstrate that it is low levels of Conscientiousness and Emotional Stability when drunk, above and beyond low levels when sober, that are associated with hazardous drinking outcomes.

Regarding Conscientiousness, though being generally low on conscientiousness (e.g., being less planful, less deliberative) and engaging in risky or harmful activities when intoxicated may, superficially, seem to reflect somewhat redundant constructs, we feel such a finding reflects more than criterion contamination (Anastasi, 1988; Darkes et al., 1998), due to the nature of the item content and implied time frames of the respective items. Specifically, the Conscientiousness items (e.g., "I like order," "I am exacting at my work") reflect more of a consistent, trait-like pattern of preferences and behaviors (which may differ across sober and drunken states, but in a consistent manner), whereas the consequence items address the occurrence of *specific* behavioral instances (e.g., "Have you damaged property, set off a false alarm, or other things like that after you had been drinking?") as well as alcohol-related harms that do not necessarily refer to a specific drinking episode, but rather are indications of more general misuse or dependence (e.g., "Have you ever felt like you needed larger amounts of alcohol to feel any effect?"). Therefore, we feel we can report the association between negative alcohol consequences and low drunk Conscientiousness as evidence of both good criterion validity and a discernible relationship between two related but distinct constructs.

The association between low levels of drunk Emotional Stability and more frequent alcohol-related consequences is consistent with findings from Westmaas and colleagues (2007), who found that low levels of general Emotional Stability were associated with engaging in "emotionally labile" intoxicated behaviors such as crying or becoming overly apologetic when drunk (Westmaas et al., 2007). Though these authors did not assess both sober and drunk Emotional Stability, nor use an existing standardized measure of alcohol consequences, the nature of their findings are in line with those of this study, as well as with the commonly-held notion that individuals who are particularly emotionally unstable when intoxicated tend to experience more drinking problems than those who are not. Though aspects of these findings may appear intuitive, the significance of drunk state factors when sober state factors are accounted for underscores the clinical importance of specifically assessing factor levels associated with intoxication and using that information to validate and predict behaviors exhibited in that state. Until the current application of the FFM to drunk mood and behavior, this had yet to be done.

Limitations

Our findings yield strong support for using the FFM to characterize clinically relevant self and informant perceptions of the expression of personality states when drunk. However, several limitations should be noted. First, the sample comprised mostly White, underage (i.e., under the legal drinking age of 21), college student drinkers. Thus, these participants

may reflect a somewhat homogenous population regarding ethnicity, age, and drinking habits, limiting the findings' potential generalizability. Specifically, older or more experienced drinkers who clinically diagnose with an AUD may exhibit different and more severe or negative sober-to- drunk differences than non-dependent, episodic college student drinkers. However, although the magnitude of differences in trait expression (as well as the absolute levels of these traits) might vary across ages, populations, and contexts, there is no reason to question the qeneralizability of the framework being put forth. Second, all factor data were based on self and informant reports of perceptions of "typical" states – i.e., there was no experimental manipulation of drunkenness or objective ratings of trait expression by trained, neutral parties. Consequently, we do not have a clear idea of how dose or context-dependent these state differences are nor whether raters consider both ascending and descending limbs of the blood alcohol curve (associated with stimulating/euphoric effects and depressant/sedative effects, respectively; e.g., Martin et al., 1993). Specifically, were targets and buddies "averaging" their ratings across their recalled experiences, or thinking of particular instances when they made their reports? Because we have no way of knowing this, it remains possible that the reports of drunken states were informed by demand characteristics, personality-relevant alcohol outcome expectancies, and other factors.

However, assessing individuals' alcohol expectancies in this self-reported context would still not provide information about the relationship between expectancies and past behavior (specifically, do alcohol expectancies influence intoxicated behaviors, or does past behavior shape current alcohol expectancies?). Direct observational studies, both experimental and naturalistic, would be valuable in working to clarify these remaining issues. Also, because we only collected data on how long and how well buddy pairs knew each other during the second semester of data collection, we were able to give some summary statistics on this subsample but were underpowered to conduct moderating analyses. Specifically, we were unable to determine if agreement depended on the quality of the relationships, which has previously been found to be a significant predictor of self-other personality consensus (Connelly and Ones, 2010; Vazire, 2010).

Conclusions

These findings support the use of the FFM in depicting self and informant-reported perceived differences in expressed mood and behavior across sober and drunk states. Agreement between self and buddy reports was uniformly significant and of a magnitude consistent with the larger personality literature, supporting the use of informant reports to assess personality expression across conditions and contexts. On average, drinkers reported lower levels of Conscientiousness, Intellect, and Agreeableness, and higher levels of Extraversion and Emotional Stability when intoxicated. Additionally, there is evidence that individual differences in both drunk Conscientiousness and drunk Emotional Stability are associated with harmful drinking outcomes, even after controlling for other sober and drunken trait levels and one's frequency of binge drinking. This highlights the clinical relevance of the FFM in assessing mood and behavior specific to drunken states. For example, it may provide the groundwork to predict individuals' types of drunken behaviors and negative responses to alcohol based on their sober trait expression, which could lead to valuable goal-directed approaches for drinking interventions.

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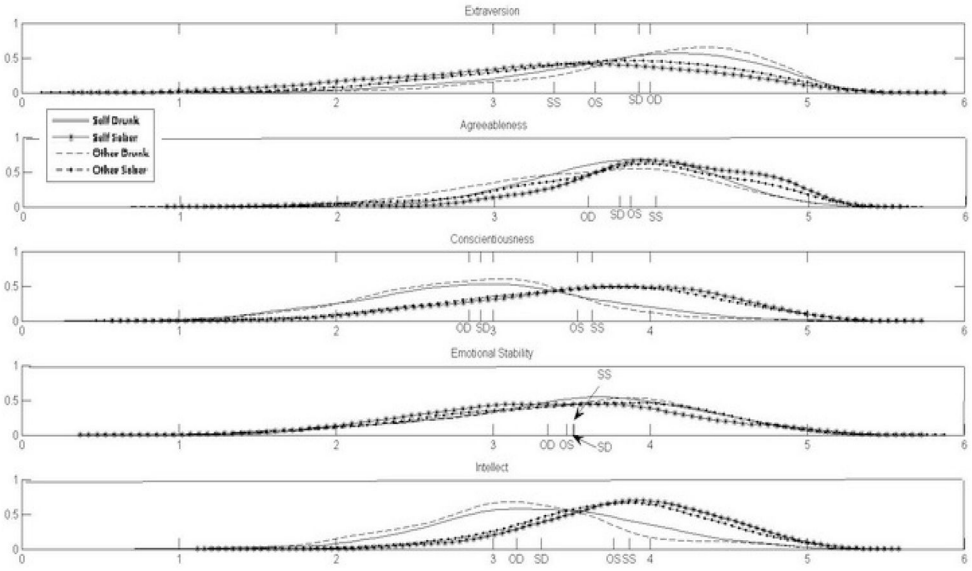

Figure 1.

Probability density functions of personality scale scores as reported by target (of self) and other (of target) for both sober and drunk conditions (N = 374).

Note: The vertical bars represent the raw means of the respective groups (i.e., Self Sober, Self Drunk, Other Sober, Other Drunk). The density functions are graphed using kernel density estimation, a smoothing procedure.

Table 1

Correlations among Sex, Binge Drinking Frequency, YAAPST scores, and self-reported sober and drunk factors (corrected for clustered structure) (N = 374)

				Sober					***Drunk***			
FFM Traits	**Sex**	**Binge**	**YAAPST**	**Extra**	**Agree**	**Cons**	**ES**	**Intel**	**Extra**	**Agree**	**Cons**	**ES**
Sober												
Extra	.14**	.12*	.08									
Agree	.27***	.11	−.01	.26***								
Cons	.05	−.17**	−.22***	−.12*	.12**							
ES	−.15**	.03	−.07	.24***	.14*	.11*						
Intel	−.19**	.04	−.04	.03	.24***	.10	.01					
Drunk												
Extra	.19***	.18***	.15*	***.72*****	.21***	−.03	.23***	.04				
Agree	.25***	−.02	−.11	.26***	***.69*****	.12*	.16**	.21***	.19***			
Cons	.02	−.19***	−.29***	−.06	.08	***.55*****	.04	.09	−.25***	.10		
ES	−.18**	−.05	−.16**	.17**	.13*	.10*	***.68*****	.12*	.23***	.21***	.07	
Intel	−.22***	−.07	−.05	.03	.09	.04	.06	***.57*****	.00	.30***	.39***	.04

Notes: Within-condition correlations (i.e., sober traits with sober traits, drunk traits with drunk traits) are highlighted in light grey. Across-condition correlations (i.e., sober traits with drunk traits) are highlighted in dark grey. Within trait, across condition correlations (e.g., sober Extraversion with Drunk Extraversion) are italicized and bolded. Sex (0 = Male; 1 = Female); Binge = Binge drinking status (5 drinks within a single sitting over the last 30 days) within the last 12 months (Non binge = never binge drink; Binge = Binge drink 1–3 times per month; Heavy Binge = binge drink once a week or more); YAAPST = mean of consequences endorsed for past year from the Young Adult Alcohol Problems Screening Test; Agree = Agreeableness; Cons = Conscientiousness; ES = Emotional Stability; Intel = Intellect; Sober = pertaining to reports of sober state; Drunk = pertaining to reports of drunken state;

* $p<.05$;

** $p<.01$;

*** $p<.0001$

Table 2

Correlations among Sex, Binge Drinking Frequency, and self-reported sober-to-drunk differences (difference = drunk score – sober score) for each of the five factors of personality (corrected for clustered structure)

	Sex	Binge	Extra	Agree	Cons	ES
Extra	−.01	.00				
Agree	−.10	−.14*	.09			
Cons	−.07	−.02	−.25***	.25***		
ES	.01	−.09	.13*	.06	.06	
Intel	−.03	−.09	−.08	.33	.42***	−.06

Note: Sex (0 = Male; 1 = Female); Binge = Binge drinking status (5 drinks within a single sitting over the last 30 days) within the last 12 months (Non binge = never binge drink; Binge = Binge drink 1–3 times per month; Heavy Binge = binge drink once a week or more); Δ Extra = Self-reported sober-to-drunk differences in Extraversion; Δ Agree = Self-reported sober ober-to- drunk differences in Agreeableness; Δ Cons = Self-reported sober ober-to-drunk differences in Conscientiousness; Δ ES = Self-reported sober ober-to-drunk differences in Emotional Stability; Δ Intel = Self-reported sober ober-to-drunk differences in Intellect;

* $p<.05$;

** $p<.01$;

*** $p<.0001$

Table 3

Intraclass Correlation Coefficients (ICCs) representing agreement between self and informant reports on personality (N = 374, n = 187 pairs)

	Agreement ICC	
	Sober	Drunk
Extraversion	.44***	.33***
Agreeableness	.18**	.22***
Conscientiousness	.46***	.30***
Emotional Stability	.39***	.47***
Intellect	.24***	.15**

Note:

* $p<.05$;

** $p<.01$;

*** $p<.0001$

Table 4

Unstandardized (and standardized) Coefficients for Sex, Binge Drinking Frequency, and Self- Reported Sober and Drunk Levels of the Five Factors Predicting Alcohol-Related Consequences (with individuals clustered within drinking buddy pairs; N = 374)

	YAAPST			
		SE		SE
	b	***b***	β	β
	Predictors			
Sex (female ref)	.53	.40	.53	.40
Binge Frequency (never binge ref)				
Heavy Drinkers	4.18	.56***	4.18	.56
Episodic Drinkers	1.56	.55**	1.56	.55
Extra-S	−.11	.30	−.10	.26
Extra-D	.61	.39	.41	.27
Agree-S	.29	.41	.18	.26
Agree-D	−.19	.48	−.11	.27
Cons-S	−.17	.31	−.12	.22
Cons-D	−.88	.35	−.64	.25
ES-S	−.09	.30	−.07	.24
ES-D	−.77	.33*	−.56	.24
Intel-S	−.72	.41*	−.39	.23
Intel-D	.51	.39	.33	.25

Notes: Sex (0 = Male; 1 = Female); Binge Frequency = Frequency of binge drinking (5 drinks within 2 hours over the last 30 days) within the last 12 months (3-level variable; 1 = never binge drink; 2 = Binge drink 1–3 times per month; 3 = binge drink once a week or more); YAAPST *b* (β) = unstandardized (and standardized) estimates of mean of consequences endorsed for past year from the Young Adult Alcohol Problems Screening Test;; Extra-S = Sober Extraversion; Extra-D = Drunk Extraversion; Agree-S= Sober Agreeableness; Agree-D = Drunk Agreeableness; Cons-S = Sober Conscientiousness; Cons-D = Drunk Conscientiousness; ES-S = Sober Emotional Stability; ES-D = Drunk Emotional Stability; Intel-S = Sober Intellect; Intel-D = Drunk Intellect;

* $p<.05$;

** $p<.01$;

*** $p<.0001$