



Published in final edited form as:

Clin Psychol Sci. 2017 May ; 5(3): 439–456. doi:10.1177/2167702616689780.

An Experimental Investigation of Drunk Personality Using Self and Observer Reports

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Abstract

Across various cultures there are robust stereotypes regarding how alcohol intoxication alters individuals' normative personalities. However, whether these stereotypes are rooted in genuine average effects or in salient, socially-proliferated exemplars remain unclear. The current study tested if differences between sober and intoxicated personality expression can be observed reliably by trained raters during a drinking episode. Participants ($N = 156$), half of whom received alcohol, attended laboratory sessions in same-gender friend groups and engaged in activities designed to elicit a range of personality expression. Participants completed self-reports of their "typical" sober and drunk personalities two weeks prior to their sessions and via two short measures during the session. Additionally, participants were recorded and rated by multiple ($Range = 5-17$) trained raters using three personality measures. Self-perceptions of sober-to-drunk personality differences were more pervasive than observer-perceptions, but alcohol-induced changes in Extraversion, specifically, were robust across measures and reporters.

Keywords

Personality; Drunk personality; Alcohol; Five-factor Model; Intergroup dynamics

The notion that people "are different" under the influence of alcohol is widely accepted by those familiar with intoxication – either firsthand or from afar. In fact, the specific nature of drunken behaviors, and how they differ from one's sober behaviors, is often a basis for

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³Because previous investigations have found facets of Neuroticism to associate with certain dependent variables in different directions (e.g., Roose et al., 2012) separate facet level analyses were conducted for Neuroticism facets in a parallel manner to the analyses conducted for Extraversion facets to detect sober vs. drunk personality differences as assessed through the RBQ. However, results from these analyses suggest all condition differences were insignificant and in the same direction (i.e., sober levels higher than drunk levels), consistent with the overall Neuroticism finding.

Author Contributions: R.P.W., K.J.S., and D.S. developed the study concept and design. Online and in-person data collection were performed by R.P.W. and research assistants. R.P.W. and S.P.L. conceptualized and performed the data analysis and interpretation, with significant consultation and guidance from D.S. R.P.W. drafted the manuscript and all authors were highly involved in the revision process, providing critical insights on content and structure. All authors reviewed and approved the final version of the manuscript for submission.

determining if a drinker has a “drinking problem.” For instance, many clinicians and those in recovery who adhere to twelve-step programs 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>). Additionally, some criteria in the Diagnostic Statistical Manual (DSM-5; American Psychiatric Association, 2013) for Alcohol Use Disorder (AUD) are conditioned on immediate consequences of alcohol consumption. In particular, the criteria, “Continued use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol,” and “Recurrent alcohol use in situations in which it is physically hazardous,” can directly be tied to what people say and do when intoxicated. These clinical examples highlight the importance of understanding the differences between sober and intoxicated mood and behavior in a systematic way, with a common language for researchers, providers, and treatment-seekers.

Laboratory Studies of Acute Effects of Alcohol

The scientific literature on alcohol’s acute effects documents a wide range of behavioral and affective consequences resulting from alcohol’s actions on the central nervous system (CNS) and neurotransmitters. For example, intoxication has been shown to increase impulsivity and disinhibition in laboratory-based speeded and divided attention tasks (e.g., Fillmore, Vogel-Sprott & Gavrilesco, 1999; Fillmore, 2007). Feelings and displays of aggression have also been found to increase with alcohol, especially following a provocation (e.g., Bushman & Cooper, 1990; Giancola, 2002). Aspects of creativity and abstract thought, measured through tasks of idea association, originality, verbal fluency, and creative problem-solving, can be negatively affected by consumption (see Norlander, 1999, for review). Regarding mood, alcohol has anxiolytic and stress-reducing properties (see Sayette, 1999, for review). Specifically, these effects have been found to be dose and context dependent (e.g., Sher & Walitzer, 1986; Donohue, Curtin, Patrick, & Lang, 2007), with intoxicating doses consistently acting as robust anxiolytics, but lower doses not necessarily doing so (Sher, 1987; Sher & Wallitzer, 1986). Along with the reduction of negative emotion is the increase of positive emotion with alcohol. Findings from multiple experimental studies have demonstrated support for alcohol leading to (self and observer-reported) increases in feelings and displays of elation, happiness, and sociability (e.g., Abe, 1968; Babor et al., 1983; Martin et al., 1993). Across all such studies it is important to note that the observed behavioral effects of alcohol intoxication frequently involve changes related to constructs that form the foundations of different dimensions of personality assessment (McCrae & Costa, 1987, 2003, 2008).

Broader Theories of the Global Effects of Alcohol

In contrast to many of the laboratory-based studies that highlight individual effects of alcohol, researchers and theorists have posited models of how alcohol acutely affects drinkers’ cognition and behavior more generally. One of the broadest was MacAndrew and Edgerton’s (1969) description of intoxication-related changes (described as one’s “drunken comportment”) as part of the universally-accepted notion that 1) people, in general, comport themselves differently when under the influence of alcohol, and 2) that these differences are displayed and perceived within the context of one’s own culture. Another, perhaps

complementary, explanation of intoxicated behaviors was put forth by Steele and Josephs (1990), and classifies three broad types of alcohol effects: drunken excess, drunken self-inflation, and drunken relief. These effects were couched within the authors' broader cognitive-physiological theory of alcohol myopia, which suggests that alcohol intoxication leads to an interaction between short-sighted information processing and the cues present during the drinking episode (Steele & Josephs, 1990).

The concepts behind both drunken comportment and alcohol myopia underscore the role of "outside" influences (the cultural context and salient environmental stimuli, respectively) on alcohol's impact on mood and behavior. Though these conceptual structures are useful for highlighting the multitude of potential effects, they do little to advance the development of the shared language necessary to discuss sober-to-drunk changes. Ideally, this shared language would be a framework that is already in existence to describe "typical" (sober) mood, affect, and behavior, and therefore is ripe for comparing drunk states to sober states.

The Concept of "Drunk Personality"

Given that alcohol-related changes can be described in terms of systematic differences in thoughts, feelings, and behaviors, they could be examined within the existing structure and conceptualization of personality. Specifically, the Five-Factor Model (FFM; McCrae & Costa, 1987, 2003, 2008), the most widely-used model of personality that has been applied in cross-cultural research for over 50 years (McCrae & Allik, 2002), is a compelling framework. The FFM consists of five broad factors or personality traits, specifically, Neuroticism, Extraversion, Agreeableness, Openness to experience/Intellect, and Conscientiousness.

Though some traditional trait theorists (Allport, 1937; Block, 1989; McCrae & Costa, 1987, 2003) might take issue with the application of the word *personality* to describe something that can change quickly, and is therefore not necessarily a stable and enduring construct, others have argued that personality expression is highly dependent on situational features, such as environment, companions, social role, and time of day (Mischel & Peake, 1983; Mischel & Shoda, 1995; Fleeson, 2001). Thus, given that an individual's measurable constellation of affects, behaviors, and cognitions (i.e., personality) varies across different situations but holds across comparable similar situations (Graham, 2000; Fleeson, 2001), personality can be thought to possess qualities of both stability and flexibility, allowing intoxicated displays of mood, affect, and behavior to be consistent within a given person (i.e., demonstrate stability), while being different from the individuals' personalities in other states or situations (i.e., demonstrate flexibility).

The study of "drunk personality"

Winograd and colleagues found support for using the FFM to depict "drunk personality" in three studies, prior to which the FFM had only been applied to individuals' personalities when sober. The first study (Winograd, Littlefield, Martinez, & Sher, 2012) was exploratory and designed to assess whether drunken personality expression could be measured using the FFM and, if so, to examine normative differences between reported sober and drunk levels. Using reports from over 1,000 undergraduates at a Midwestern university, confirmatory

factor analysis procedures (derived and replicated on different subsamples) suggested the FFM could be applied to one's 'typical' drunken state as well as it could be applied to one's 'typical' sober state. Regarding perceived sober-to-drunk differences, self-reports of Extraversion displayed a normative increase with intoxication, while (in order of effect size) Conscientiousness, Intellect, Agreeableness, and Neuroticism were all perceived to decrease significantly. However, due to potential influence of bias, recall difficulty, and outcome expectancies in self-reports, a subsequent study (Winograd, Steinley, & Sher, 2014) was conducted, for which the authors had drinkers bring one "drinking buddy" into the lab and report on each other's sober and intoxicated personalities. The application of the FFM was again supported as an organizing framework for drunk personality, with findings replicating the normative five factor differences previously found. Findings also indicated that such changes are perceived by both informants and the self, with self-other agreement being consistent across reports of "normal" (sober) and intoxicated personalities. Moreover, low levels of self-reported drunk Conscientiousness and drunk Emotional Stability (the inverse of Neuroticism) were associated with experiencing more alcohol-related consequences, even when adjusting for sober levels and binge-drinking frequency. This latter finding highlighted the clinical relevance of the FFM in assessing personality-like mood and behavior specific to drunken states.

Though studying normative patterns of sober-to-drunk change was the logical starting place for establishing the application of the FFM to the study of "drunk personality," Winograd and colleagues were also interested in individual differences in types and magnitude of change, which could prove valuable for screening and intervention settings. Using the self-reported data from the "drinking buddies" study, a model-based clustering approach employing finite mixture models revealed a four cluster solution (Winograd, Steinley, & Sher, 2016) based on sober and drunk levels of each of the factors and the degree of sober-to-drunk differences. Although within-person magnitude of overall personality change across factors, as measured by intraclass correlation coefficients (ICCs; Shrout & Fleiss, 1979), was not associated with experiencing alcohol-related consequences in the past year, cluster membership was. Specifically, those who belonged to the cluster dubbed "Mr. Hyde" reported particularly large alcohol-induced decreases in Agreeableness, Conscientiousness, and Intellect, and also scored higher on the Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut & Sher, 1992), a measure of alcohol-related harms and AUD symptoms.

Research Questions

The present study builds upon and extends earlier findings on drunk personality by addressing possible self- and informant-reported biases and naturally occurring variation in drinking dosage and self-selected drinking contexts by standardizing both within a laboratory setting. The primary goal of this study was to determine if the mean differences in the five factors found in self-report surveys in Winograd and colleagues' initial studies (2012, 2014, 2016) would be replicated in an experimental context in which alcohol dose and setting are controlled, and trained raters, blind to condition and unfamiliar to participants, assess personality expression in recorded laboratory sessions.

Methods

Participants and Procedure

Recruitment—Following receipt of University IRB approval, participants ages 21 through 30 from a Midwestern university and the surrounding community were recruited through targeted and campus-wide information emails, newspaper advertisements, Facebook postings, and posted notices on public kiosks. Eligibility (e.g., being age 21–30, being a moderate drinker, not having any major medical conditions) of prospective participants was evaluated by phone, and nodes (i.e., “main participants”) provided the names and phone numbers of five to seven same-gender¹ friends who could likely participate. All friends were emailed and asked to respond with additional contact information if interested in participating, at which point they were contacted via phone and their eligibility was assessed. Depending on friends’ eligibility and availability, three were selected to participate (to form a group of four). In the instance that a participant canceled or we were not able to confirm a fourth group member, the session was run with three participants.

Sample characteristics—Participants were 156 (43 groups of three [16 groups] or four [27 groups] people [$M = 3.65$, $SD = .48$]; 50% male sex and gender) students and non-students, approximately evenly balanced across condition (Sober condition $n = 80$; Alcohol condition $n = 76$). The sample was White (87.50%), Black/African-American (9.21%), and American Indian (1.97%).

Pre-session online survey—Participants received a customized link to an online survey they were instructed to complete prior to their session. The survey contained questions regarding typical alcohol consumption and demographic information, and 100 personality items, 50 pertaining to participants’ “typical sober” personality and 50 pertaining to their “typical drunk” personality (using Goldberg’s International Personality Item Pool [IPIP; http://ipip.ori.org/New_IPIP-50-item-scale.htm] scale, which was used in Winograd et al., 2014 and Winograd et al., 2016), on which participants rated themselves. This self-reported personality data was gathered to examine if the results from the two previous studies could be replicated, as well as to compare with retrospective data generated by later experimental self and observer reports.

Group sessions—Session condition (i.e., Sober or Alcohol) was determined immediately prior to each session through the use of a computerized urn randomization program (developed for Project MATCH, accessible through <http://www.commed.uchc.edu/match/urn>). For this project, groups were balanced based on group gender, session day of week, and number of people in the session. Participants arrived (at 5pm on weekdays, 2pm on weekends) in friend groups and were greeted by research assistants to conduct the informed consent, initial breathalyzing, and height and weight measurements. Additionally, participants underwent an approximately 20 minute semi-structured interview regarding the course and content of their most recent drinking episode as part of a separate investigation.

¹Groups were formed based on participants’ reported gender, as opposed to their biological sex. However, biological sex (in addition to height, weight, and date of birth) was used to determine beverage dosage.

BFI-10-Self (self-reported)—At two designated times during the session, participants completed the Big Five Inventory – 10 (BFI-10; Rammstedt & John, 2007), a brief measure of the five factors of personality. Because this measure was also used by observers, the self-reported version will be referred to as the **BFI-10-Self**. This measure was designed to be completed in under a minute, and consists of two items for each of the five factors (10 items). It has demonstrated good generalizability to a fuller five-factor scale (the BFI-44; Rammstedt & John, 2007), with part-whole correlations ranging from .74 (Agreeableness) to .89 (Extraversion). Additionally, it achieved high levels of external validation when peer and self-ratings were compared (convergent validity correlations averaged .44; Rammstedt & John, 2007). Once upon arrival to the laboratory (the baseline assessment) and once at the midpoint of the testing session (the midsession assessment, when intoxicated participants were at or near their peak blood alcohol concentration [BAC]), participants completed the BFI-10-Self based on how they perceived themselves *at that exact moment*. Each item (e.g., “I see myself as someone who is reserved,”) has a 5-point Likert response scale, ranging from “Disagree Strongly” to “Agree Strongly.”

Beverage administration—Following consent procedures, participants were informed that they were either in the Alcohol or Sober condition. In the Alcohol condition, participants were administered a moderate-heavy dose of alcohol (natal males: .82g/kg; natal females: .74g/kg) in order to reach a BAC of approximately .09. Beverages consisted of 1 part vodka to 3.5 parts Sprite®, and dosage was calculated according to participants’ body mass index (BMI), birthdate, and natal sex. Consumption took place over 15–18 minutes, followed by a 15-minute absorption period. Participants in the Sober condition were given an isovolemic amount of Sprite (i.e., the same total volume of liquid they would have received in the alcohol condition) that they consumed over a 15–18 minute period. Participants in both the Sober and Alcohol sessions were breathalyzed (using Alco Sensor IV; Intoximeters, St. Louis, MO) five times: prior to initiating drinking, ten minutes into the absorption period, at two designated times during the activity session, and at the end of the formal testing session (see Figure 1 for session timeline). (The mean BACs of the participants in the Alcohol condition at the four time points during the activity session were: post-absorption BAC = .090 (SE = .01); post City Planning activity BAC = .083 (SE = .00); post Mind Trap activity BAC = .082 (SE = .00); post Drawbridge activity BAC = .081 (SE = .02).

Activity session—At the conclusion of the beverage administration and absorption periods, participants were lead through five activities. These activities varied in length and amount of group interaction and were chosen with the intention of eliciting a range of personality and behavioral displays relevant to each of the five-factors (see Table 1 for brief descriptions and Supplemental Materials for complete descriptions of each task). Participants were compensated \$10/hour for their participation, or two PSYC 1000 research credits per hour if they were enrolled in an introductory psychology course at the university.

Audio-visual surveillance equipment—Each participant was recorded individually through fixed-lens cameras (Pelco IS90CHV9) and hanging microphones (Beyerdynamic BM-33). The audio and visual recordings were then streamed to a DVR storage device

(Pelco DX4708-20001) in an adjacent room to be watched and rated at a later date. Participants were told during the informed consent process that the sessions were taped, and the cameras and microphones were visible throughout the entirety of the sessions.

Observational Assessment of Personality

Notably, behavioral analysis can be conducted at several levels of specificity, ranging from the concrete and molecular (e.g., FACS; Ekman, Friesen, & Hager, 1978), to the more impressionistic and molar (Mischel, 1973). For the purposes of this project, the ideal rating system would capture more general and intrinsically meaningful behaviors and aspects of personality at a level specific enough to be reliably rated, while still being relatively simple and easy for raters to learn and use. The three observer-reported personality measures are described below.

The Riverside Behavioral Q-sort—The Riverside Behavioral Q-sort (RBQ; Funder, et al., 2000) is a 68-item behavioral measure designed to rely heavily on the observational ability and common sense of the raters (Funder et al., 2000). Of note, the Q-sort approach is an ipsative and idiographic rating system, which relies on judges to place or “score” items based on their relative application to a given individual (e.g., “Is this person more or less X than they are Y?”). The RBQ was compiled and evaluated by a group of clinical psychologists and psychiatrists specifically to code behaviors of adults as they interact with partners and was based off of an existing 100 item personality Q-sort, the California Adult Q-set (CAQ; Block, 1978) that was designed to represent comprehensive coverage of personality with minimal redundancy.

RBQ and FFM—To date, there appears to be only one published study that directly examined the behavioral items of the RBQ within the context of the FFM of personality. Markey, Markey, and Tinsley (2004) evaluated the associations among child participants’ ($N = 94$, mean age = 10.54 years) personalities and behaviors as they interacted with their parents during a semi-structured task. The authors found that behaviors were related to traits in a “fairly intuitive manner” and, overall, generated support for the usefulness of behaviors as indicators of personality – specifically, behavioral displays assessed by the RBQ and personality traits measured by the FFM.

RBQ items and procedure—A total of 61 RBQ items were sorted by trained raters (see Appendix for all items and contact first author for details on the RBQ refinement process), from least to most characteristic of the participant. To complete the RBQ, raters used a computer-based Q-sorter program (made publicly available by the Riverside Accuracy Project at <http://rap.ucr.edu/qsorter/>) to first divide items into three preliminary piles (Uncharacteristic, Neutral, and Characteristic) and then into final piles, (“Extremely uncharacteristic” [1] to “Extremely characteristic” [9]), with the program assigning a specific number of items that can be placed into the final piles.

Thin Slice—Personality ratings from “Thin Slices” (i.e., 30 seconds - 5 mins) of recorded behavior have been found to be reliable assessments of the five-factors of personality (Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004; Oltmanns, Friedman, Fiedler, &

Turkheimer, 2004). A thin slice is a brief, dynamic sample of a person's behavior and most often consists of a segment of a video showing a person interacting with others or performing a task (Oltmanns et al., 2004). Borkenau and colleagues collected multiple types of personality data - self-reported NEO-FFI responses, reports from acquaintances and experimenters on the NEO-FFI, intelligence tests, and Thin Slice observational ratings based on a 5-minute video clip of a semi-structured interaction. The authors found judges' Thin Slice FFM ratings to be weakly to moderately correlated with self-reported NEO-FFI ratings (e.g., correlations with self-ratings were .18 [N], .30 [E], .31 [O], .22 [A], and .08 [C]). However, Oltmanns et al. (2004) found that 172 unacquainted raters demonstrated high levels of agreement (using ICCs) when rating personality judgments after viewing only 30 seconds of a stranger's behavior (ICCs: N = .58; E = .93; O = .88; A = .88; C = .82). These findings suggest that ratings of thin slices of behavior may provide yet another tractable and ecologically valid approach for objectively studying sober and intoxicated personality.

To utilize the Thin Slice assessment method in this study, raters viewed five minute segments of the recorded sessions and rated participants based on their impressions from that clip. Clip segments included the first five minutes of the Commonalities and Uniquities task, which allowed raters to view participants in a collaborative environment which occurred near the intended peak of intoxication (for those who consumed alcohol). The rated items were the names of each of the five factors, with descriptions included on a separate document for reference (e.g., Extraverted [talkative, assertive, active, excitement-seeking, and fun-loving]). Raters indicated the degree to which each item applied to the person on the recording. Ratings were based on a 1–10 Likert scale (see Oltmanns et al., 2004 for discussion of this methodology).

BFI-10-Observer—In addition to this “short form” measure of FFM personality traits being used in a self-report format twice during each session (see BFI-10-Self section above), the BFI was also used in an observer-report format by raters after viewing the entirety of the recorded session. Currently, there appear to be no published uses of the BFI-10 with unacquainted observer ratings, but this project attempts to do so as the only FFM personality assessment based off participants' personalities over the entire session.

Rating procedure—Raters were instructed first to watch a five-minute clip beginning at the start of the “Commonalities and Uniquities” task. Immediately after viewing, they completed the Thin Slice measure. Following this, raters watched a three-minute “drink clip” from the consumption period when the participants were drinking their second beverage. This was to allow the raters to get an impression of the participant during an unstructured, casual conversation, before they viewed the activity session, which was, by design, more structured. Next, the raters watched the recording of the entire session (ranging from 35–55 minutes, depending on how much time the group members required to be breathalyzed, complete brief measures, and use the restroom). Once they had viewed both recordings, raters completed the BFI-10-Observer and the Q-sort procedure for the RBQ using the Riverside Accuracy Project Q-Sort Program. Each participant's Thin Slice clip, drink clip, and full session were viewed and rated by an average of approximately seven trained raters ($M = 6.96$, $SD = 2.18$), a slight improvement upon the methodology from

Funder and Colvin (1991), which utilized six raters per participant. Additionally, reliability checks and training on the rating systems were ongoing (conducted approximately once per month), both to emphasize the importance of consistency and to inform any newly-hired RAs about protocol and techniques.

Assignment of RBQ items to a five-factor structure—Because the sample size ($N=156$) was too small to freely estimate all 61 item loadings in an exploratory factor analysis, the RBQ items were assigned to the five factors based on structured, quantitative survey feedback from 21 solicited experts in the field of personality psychology and the 14 undergraduate RAs who were involved in running the participant sessions and rating personality expression. Predictably, the 61 items were not assigned evenly across factors, and three items “loaded” equally on two factors, and were placed on both factors. Extraversion had the most items (30), followed by Agreeableness (14), Neuroticism (11), Openness (6), and Conscientiousness (3) (for a full list of items by factor see Table S1 in Supplemental Materials and for a full discussion of the method involved in the assignment process please contact the corresponding author).

Inter-rater reliability and agreement—To determine inter-judge agreement, reliability analyses were conducted regularly as the data was collected, and items with low agreement were given particular attention at monthly project staff meetings. Upon the completion of data collection and personality ratings, final ICC calculations were conducted on the Thin Slice, BFI-10-Observer, and RBQ items. Due to the unique design of this study, none of the six ICCs discussed by Shrout and Fleiss (1979) were deemed appropriate. This is because the participant groups varied in size (three or four people), different subsets of the 23 total RAs rated each group, and, though the majority of groups were rated by six raters, the number of raters rating each group also varied (range 5–17; $M=6.96$, $SD=2.18$, median and mode = 6). Therefore, in order to calculate the most appropriate ICCs, a generalizability theory approach (see Shrout & Lane, 2012) was taken through the division of the data into three factors: the participants, the groups, and the raters. Specifically, variance decomposition on four effects (the three main effects, one interaction [rater by group], and error) was conducted using Proc Varcomp (SAS 9.3, SAS Institute Inc., 2011) to allow for the variance of these effects to be estimated separately².

The population ICC formula (based on = 5 [minimum], = 6 [median and modal], and = 17 [maximum] raters) consisted of the following:

$$ICC = \frac{\sigma_P^2}{\sigma_P^2 + (\sigma_E^2/k)}$$

²Though estimated and accounted for in its relation to all other variance components, the rater by group interaction was not included in the ICC formula. This was because modeling it would imply it to be a random effect and it was more consistent with the modeling strategies of the other analyses (i.e., the hierarchical linear models clustering errors by the unique groups in this study, as will be described later) to treat this interaction as a fixed effect (i.e., the groups in the study were the only groups of interest). Also note that the other two possible interactions – participant by rater and participant by group – were neither estimated as variance components nor included in the ICC formula. This was because, for each item, only one instance of each of these respective combinations was possible (i.e., raters rated each participant on each item only once and each participant belonged to only one group).

In this equation, σ_P^2 corresponds to the amount of variance in rater ratings attributable to the participant, P , being rated, while σ_E^2 corresponds to the (error) variance in ratings that could not be accounted for by any of the effects in the model.

ICCs—For all three measures (assuming the number of raters was equal to 6), there was the highest amount of rater agreement on Extraversion and the lowest on Openness (see Table S2 in Supplemental Materials). All ICCs were in the moderate to very high range (lowest: Thin Slice Openness = .46; highest: RBQ Extraversion = .91) with the following means across personality factors: Thin Slice: $M = .66$, $SD = .13$; BFI-10-Observer: $M = .68$, $SD = .11$; RBQ: $M = .77$, $SD = .08$.

Between-rater correlations of RBQ data—Due to its Q-sort format, the RBQ necessitated an alternative approach to estimating reliability. Specifically, whereas for nomothetic measures it is sensible to obtain reliability estimates at the item level, for ipsative data, it may be more appropriate to examine between rater correlations of their responses across all items. Therefore, to examine reliability in this way, correlations across all raters of all participants were calculated, giving mean values by rater (i.e., that rater's average correlation with every other rater across all participants), as well as a single value of the total mean correlation (i.e., across all raters and participants). The mean rater agreement for the RBQ was .61, with the highest correlating rater having a mean correlation of .79 with other raters, and the lowest correlating rater having a mean correlation of .44.

Correlations of Personality Measures

Table S3 in Supplemental Materials displays the correlations within and across the personality measures (except the pre-session IPIP, completed separately for “typical sober” and “typical drunk” personality), but a brief summary of the correlational patterns will be provided here. Across the observer-reported measures, same-factor correlations were consistently moderate to high, with Extraversion correlations being the largest in magnitude ($r = .80 - .94$), followed by Agreeableness ($r = .41 - .83$), Openness ($r = .49 - .68$), Neuroticism ($r = .41 - .72$) and Conscientiousness ($r = .33 - .70$). Correlations between pre-session IPIP self-reports of “typical” sober and drunk personalities and in-session self- and observer-reported personality varied in magnitude, with same-factor correlations of Extraversion and Openness/Intellect generally being the largest, and those of Conscientiousness and Neuroticism the smallest in magnitude. Though not uniformly large, the robust same-factor correlational pattern demonstrated within and across reporting methods is evidence of the construct validity of the behavioral tasks and observational assessments in eliciting and measuring personality displays, respectively, which are most frequently assessed through self-reported methods alone.

Results

Preliminary Analyses

All analyses reported in this section and elsewhere were conducted using Proc Mixed in SAS 9.3 [SAS Institute, Inc., 2011] to account for clustering by friend group, unless otherwise specified.

Effectiveness of randomization—Participants in the Sober and Alcohol conditions were similar in their overall drinking patterns as evidenced by a lack of significant differences on primary drinking variables (see Supplemental Materials). Similarly, no differences (all $ps > .05$) were found between Sober and Alcohol groups on baseline (preconsumption) BFI-10-Self measures of Extraversion ($M_{sober}=3.94$; $SE_{sober}=.09$; $M_{alcohol}=3.93$, $SE_{alcohol}=.10$), Conscientiousness ($M_{sober}=3.84$, $SE_{sober}=.09$; $M_{alcohol}=3.88$, $SE_{alcohol}=.09$), Neuroticism ($M_{sober}=2.54$, $SE_{sober}=.10$; $M_{alcohol}=2.73$, $SE_{alcohol}=.11$), or Openness ($M_{sober}=3.91$; $SE_{sober}=.10$; $M_{alcohol}=3.80$, $SE_{alcohol}=.12$). However, participants in the Alcohol condition rated themselves higher on Agreeableness ($M_{alcohol}=4.03$; $SE_{alcohol}=.08$) than those in the Sober condition ($M_{sober}=3.60$, $SE_{sober}=.10$), $p = .01$, which can be viewed as a failure of randomization related to this trait. (Note we attempted to adjust for baseline differences through inclusion of baseline levels in models predicting condition differences, as described later in this section.)

Effects of Intoxication on Personality

Multiple models were estimated using various personality data as dependent variables to assess differences in participants' *self-reported* "typical sober" and "typical drunk" personalities (non-experimental effects, as assessed through the online pre-session survey) and their "in the moment" personalities (experimental effects, as assessed through the in-session BFI-10-Self), as well as *observer-reported* personalities based on the experimental sessions (as assessed through the Thin Slice, BFI-10-Observer, and RBQ measures) (see Table 2).

Non-experimental effects – replication with self-reports—To test if individuals' self-reported ratings of the five factor traits (measured in the pre-session IPIP survey) differed based on whether they were reporting on their "typical" sober or drunk personality, a three level omnibus multilevel model was estimated. In this model, Level 1 corresponded to intraindividual reports for each of the 5 personality factors when sober and when drunk (10 total per person), Level 2 corresponded to individual participants (156 total), and Level 3 corresponded to the friend group that would later be present in the testing session (43 total). Reported condition (i.e., sober or drunk) and factor (i.e., Extraversion, Agreeableness, Conscientiousness, Emotional stability, and Intellect-imagination) served as the predictor variables, as well as the interaction of the two. In the presence of a significant condition by personality factor interaction, follow-up analyses with each of the five factors as separate dependent variables were modeled to examine the source(s) of the effect. In these models, reported condition (but not personality factor) served as the predictor variable. Participant- and group-level random intercepts were estimated in both the omnibus and follow-up models (see Supplementary Materials for model details).

Within-person differences in the pre-session data obtained from participants' responses to the IPIP (based on their "typical sober" and "typical drunk" personalities) indicated significant perceived sober-to-drunk differences in each of the five factors (see Table 2, Row 1), as was found in the two previous investigations (Winograd et al., 2012; Winograd, Steinley, & Sher, 2014). In order of magnitude of effect, Conscientiousness was found to decrease with intoxication ($F(1, 148) = 379.38$, $p < .0001$), as was Intellect ($F(1, 148) =$

288.32, $p < .0001$). Extraversion increases with intoxication ($F(1, 148) = 121.16, p < .0001$), Agreeableness decreases ($F(1, 148) = 86.04, p < .0001$), and Emotional Stability (the inverse of Neuroticism) increases ($F(1, 148) = 22.12, p < .0001$).

Experimental effects—Experimental effects refer to the personality differences *between* participants in the Sober and Alcohol conditions that were self- and observer-reported based on participants' experiences during the session. Analyses were conducted for each trait separately. Furthermore, since only a single average-rater rating was used for each individual on each of the five traits, two-level multilevel models were fit in which a single random intercept for friend group was estimated. In these models, each (mid-session or whole session) factor level was predicted by condition while adjusting for baseline (pre-session) levels of that factor and self-reported IPIP “typical” sober level of that factor to gain power and account for variability in personality at baseline.

Experimental self-reported personality: Results of the BFI-10-Self analyses (see Table 2, Row 2) indicated that all factors except Agreeableness ($F(1, 105) = 1.00, p = .32$) were significantly different across conditions. Specifically, those in the Alcohol condition reported lower levels of Openness ($F(1, 105) = 6.33, p = .01$), Neuroticism ($F(1, 105) = 7.32, p = .01$), and Conscientiousness ($F(1, 105) = 4.25, p = .04$), and higher levels of Extraversion ($F(1, 105) = 6.06, p = .02$) than participants in the Sober condition during the mid-session assessments.

Experimental observer-rated personality: The models testing observer-reported differences in the five factors (as assessed through the Thin Slice, BFI-10-Observer, and RBQ measures) between participants in the Sober and Alcohol conditions were run individually for each of the five factors across the three measures. The dependent variables in these models were the means of raters' ratings of each subject, and the independent variables were condition, self-reported IPIP “typical” sober level of that factor, and self-reported BFI-10-Self baseline level of that factor. The latter two sober personality variables were included to attempt to adjust for baseline levels of a given trait when assessing alcohol-related differences (in lieu of observer-reported baseline levels, since these were not collected), as was done for analyses of the self-reported measures. Results from the three observer-reported measures are described below.

Thin Slice: When 5-minute “thin slices” of personality were judged (see Table 2, Row 3), sober and intoxicated participants differed only in Extraversion ($F(1, 106) = 4.78, p = .03$), with those who received alcohol being rated as higher than those who did not. Differences in Agreeableness ($F(1, 106) = .56, p = .46$), Conscientiousness ($F(1, 106) = .00, p = .95$), Neuroticism ($F(1, 106) = .40, p = .53$), and Openness ($F(1, 106) = .79, p = .38$) were non-significant.

BFI-10-Observer: Comparing entire sessions of sober participants to entire sessions of intoxicated participants with the BFI-10-Observer (see Table 2, Row 4), Extraversion was again the only factor that significantly differed across groups ($F(1, 106) = 11.11, p = .002$), with those who received alcohol being rated as higher than those who did not. Differences in Agreeableness ($F(1, 106) = 1.93, p = .17$), Conscientiousness ($F(1, 106) = .00, p = .99$),

Neuroticism ($F(1, 106) = .65, p = .42$), and Openness ($F(1, 106) = .00, p = .96$) were non-significant.

RBQ: When entire sessions of sober and intoxicated participants were compared using the RBQ (see Table 2, Row 5), those receiving alcohol were found to exhibit higher Extraversion ($F(1, 106) = 14.66, p < .001$) and lower Neuroticism ($F(1, 106) = 4.45, p = .04$). Differences in Agreeableness ($F(1, 106) = 2.05, p = .15$), Conscientiousness ($F(1, 106) = .38, p = .54$), and Openness ($F(1, 106) = .00, p = .98$) were non-significant.

Facets of Extraversion in the RBQ: Because the alcohol-induced difference in Extraversion was robust across all three measures, further analyses were conducted to determine which facets of Extraversion were driving the effect. Though it was not created to be a measure of the five factors, the RBQ, with a high number of diverse items, was the only measure used in the study that was capable of assessing facet-level information. Extraversion facets, according to the most prominent five-factor scholars (McCrae & Costa, 2003), include Warmth, Gregariousness, Assertiveness, Activity, Positive emotions, and Excitement-seeking. Individual items were assigned to facets by 12 personality experts and students through a protocol similar to what was conducted for the original assignment of items to factors (briefly described above and available in more detail from first author). As was the case for the original five-factor assignment survey, the 30 items were not assigned evenly across facets, and two items loaded equally on two facets (i.e., had the same absolute value survey score). Gregariousness had the most items (14), followed by Assertiveness (8), Warmth (4), and Activity (3) and Positive emotions (3) (See Table S1 for item-by-facet information.).

When personalities of the sober and intoxicated participants were compared at the facet level (for Extraversion), those receiving alcohol were found to exhibit high levels of Gregariousness ($F(1, 113) = 11.09, p = .005$), Assertiveness ($F(1, 113) = 10.03, p = .003$), and Activity ($F(1, 113) = 6.95, p = .008$) compared to those who were sober. Ratings of Warmth ($F(1, 113) = 2.01, p = .16$) and Positive Emotions ($F(1, 113) = .22, p = .89$) did not differ across conditions (see Figure 2).

Discussion

The primary purpose of this study was to investigate differences between individuals' sober and intoxicated personality expression using observers' assessments. Earlier studies of "drunk personality" yielded findings suggesting that all five factors of the FFM change systematically as a result of alcohol consumption, but because the previous data was retrospective and self- and informant-reported, it was impossible to rule out biases inherent in self-report or between friends, as well as distinguish between alcohol outcome expectancies and behavioral manifestations of personality-related traits.

Results of the investigation into the question, –“ will the findings from the initial studies be replicated and indicate significant alcohol-induced differences in each of the five factors when the traits were rated by outside observers and the drinking context and dosage were controlled? “- were decidedly mixed. Specifically, across all three observer-reported

personality measures (the Thin Slice, BFI-10-Observer, and RBQ), Extraversion levels were higher in intoxicated participants than sober participants. The literature on the relationship between alcohol intoxication and characteristics related to Extraversion is extensive, though existing research has almost exclusively focused on sober or baseline levels of Extraversion and alcohol sensitivity or risk for dependence. For example, William McDougall (1929) posited that, because people high in Extraversion have lower levels of cortical inhibition, these individuals are “more susceptible to the influence of alcohol” (p. 301). In contrast, Eysenck’s drug postulate – though also based on levels of cortical inhibition (1957) – promotes the association between depressant drugs and increased Extraversion as stronger among those who are introverted (rather than extraverted) when sober, because extraverts reach a sedation threshold much quicker. As a result, alcohol makes many introverts “much livelier” and “more garrulous” than normal (Eysenck & Eysenck, 1985; p. 194). McDougall and Eysenck are two of many (e.g., Babor et al., 1983; Marcziński, Combs, & Fillmore, 2007; Ruch, 2005) who have frequently discussed alcohol’s bi-directional association with sociability, displays of joy, disinhibition, and other affective and psychobiological qualities easily associated with this personality trait.

Indeed, the trait-level effect on Extraversion was driven by differences in the facets of Gregariousness, Assertiveness, and Activity (but not Warmth or Positive emotions). This finding is consistent with the existing research on the effects of alcohol on sociability just referenced (e.g., Abe, 1968; Babor et al., 1983) and the lack of effect of alcohol on positive affect more generally (e.g., Gilman et al., 2008; though results on positive affect are mixed – others have found that that alcohol does increase positive affect specifically [e.g., Goldberg, 1966; McCollam et al., 1980; and Rot et al., 2008]). Differential effects of alcohol on distinct aspects of Extraversion is consistent with work connecting Extraversion to both agentic and communal positive emotion (PEM-A, PEM-C; Tellegen, 1985). Based on these facet level findings, one could speculate that intoxication may be more related to increased PEM-A (social potency, dominance, achievement, well-being, etc.) than to PEM-C (social closeness, warmth, interpersonal connectedness, etc.) but our study was not designed to examine this issue in a highly resolved way. Additionally, the difference in Assertiveness, specifically, is supported by past research on alcohol’s role in shifts in internal states, such as power motivation and the need for dominance over others (e.g., McClelland, 1972). Though social assertiveness, a documented effect of intoxication (Southwick et al., 1981) is distinct from aggression, which implies intent to harm, the two qualities could be viewed as sharing a boundary, and may therefore be rooted in similar alcohol-induced causes. For example, the neurologically disinhibiting effects of ethanol may facilitate particularly assertive, firm, or bold behavior “not by ‘stepping on the gas but rather paralyzing the brakes’” (Muehlberger, 1956, p. 40).

Results from the RBQ also indicated that consumption of alcohol resulted in lower levels of Neuroticism, though this was not replicated in the Thin Slice or BFI-10-Observer, the significantly shorter, less refined measures. This difference in Neuroticism is highly consistent with previous work on the physiological (e.g., Davies, 2003) and behavioral (e.g., Sayette, 1999) stress and tension-reducing properties of alcohol and was echoed by participants’ own “real time” ratings using the BFI-10-Self.

Though the differences in Extraversion and Neuroticism were consistent with prior work and theory, the lack of differences in the other three factors in any of the experimental observer-reported measures was curious; not only were these differences reported by participants in two earlier samples, but the participants in this sample themselves reported they *were* experiencing these differences! Using both the same retrospective method that was used in the previous studies (self-reports through the pre-session online survey) as well as the experimental method during the sessions (self-reported BFI-10-Self), participants indicated that alcohol made them more extraverted, less conscientious, less neurotic, less open to new experiences, and less agreeable (note that the Agreeableness difference was only found in the retrospective measure). From the discrepancies between what the raters saw and the participants felt, three primary conclusions are possible: 1) the raters were insensitive in their ratings; they were not judging the participants' displayed moods and behaviors accurately because they neglected to see key signs of personality expression; 2) the participants were inaccurate; perhaps because their reports were influenced by expectancy-related biases or cognitive errors, participants reported on the alcohol-induced changes they *believed* they experienced but these beliefs did not align with what could be observed by nearly seven trained people looking on; and 3) both the raters and the participants were accurate (and inaccurate); the raters reliably observed and reported on what was visible to them (but nothing more), and the participants experienced internal changes that were real to them but imperceptible to observers. We suspect that the most likely conclusion is the third, as it has been heavily supported by existing work on personality inter-judge agreement (e.g., John & Robins, 1993), which states that agreement depends on multiple factors, including the content domain and observability of the trait being judged. In this case, because Extraversion is both the most observable trait and the content domain with the most well-documented inter-rater agreement (e.g., Norman and Goldberg, 1966; Funder & Drobth, 1987), it is not surprising that participants and raters agreed regarding alcohol's effects on this trait alone. Because the other traits are generally less visible, raters were unable to detect differences in them despite participants' varied internal experiences across conditions. A final potential conclusion is that, due to the lack of observer-reported baseline levels in the models, true alcohol-induced differences in sober and intoxicated personality displays could have been masked by baseline differences. Even though retrospective and experimental self-reports of sober states were used to approximate baseline levels in these models to attempt to account for this potentiality, same-method values would have provided more statistical precision.

In addition to investigating sober vs. drunk personality differences, this study also addressed questions more specifically related to personality assessment. Most generally, based on patterns of association, it appears that trained observers come to similar conclusions about personality across measurements. The use of three very different observer-reported measures – the Thin Slice, BFI-10-Observer, and RBQ – allowed for much comparison across assessment method and content, as well as the application of two of the measures in unique ways. Specifically, this was the first study to use the BFI-10-Observer to assess state-like personality trait expression and within-person differences, as well as the first to demonstrate that the RBQ can conform to the FFM structure and measure FFM trait expression in a manner that correlates very highly with existing, validated FFM personality measures. In

particular, RBQ and BFI-10-Observer factors correlated very highly, lending support to the use of both of these measures in this type of experimental context. Regarding rater agreement, consensus was very good for all three observer-reported measures. Consistent with existing personality research on observer assessment (e.g., Funder & Drobth, 1987; Markey, Markey, & Tinsley, 2004; Oltmanns et al., 2004; see John & Robins, 1993), personality items related to Extraversion tended to demonstrate the highest levels of agreement.

Limitations

The findings from this study yield further support for using the FFM to characterize perceptions of intoxicated personality. However, several limitations should be noted. First, the study took place in a non-natural drinking environment. Concerted efforts were made to increase the ecological validity over typical alcohol administration studies, which usually consist of individually run participants in tightly controlled environments, by having participants arrive in friend groups, conducting the sessions during the evening and weekends, and filling the session with engaging and reportedly enjoyable activities. However, despite these efforts, this setting remained largely dissimilar from any context in which participants are accustomed to drinking, particularly crowded bars or parties typically replete with high levels of varied and unstructured stimuli. Therefore, the intoxicated personalities displayed during the study may be different from what would characteristically be displayed during a normal drinking episode, and this difference could be a potential reason for the discrepancy in findings between the retrospective self-reports of “typical drunk personality” and the observers’ experimental ratings. In future studies, a measure could be included that assesses the participants’ view of how similar their personality was in this context to their normal drinking episodes, and that level of similarity could be included in analyses to adjust for the lack of ecological validity inherent in a controlled laboratory drinking environment.

The second limitation is in regard to dosage and limb effects. Specifically, it is likely that different dosages elicit different types or degrees of changes in mood and affect, but we were unable to study differential effects because our dosage was standardized. Indeed, researchers have found that high doses of alcohol (resulting in BACs of .10-.15%) tend to facilitate negative affect (Forth, Henschler, & Rummel, 1975) whereas more moderate doses (resulting in BACs of .04 – .09%) are more likely to elevate positive affect (Burish, Maisto, & Shirley, 1982; Connors & Maisto, 1979). Similarly, we did not observe and assess participants engaging in the same activities during both the ascending and descending limbs of the blood alcohol curve (the ascending limb is typically associated with heightened energy and improved mood, and the descending with lethargy and feeling “down” [Martin, et al., 1993]). Ideally, observers would have examined both within and between-person differences (ascending only vs. descending only) in our intoxicated participants, but practical constraints limited our ability to conduct such a comparison in the current project.

A third limitation is that the activities included in the session did not draw upon all factors and facets of personality equally and therefore did not provide enough opportunity for participants to display – and raters to observe – the full range of personality expression that

could be exhibited during an extended naturalistic observation. Fourth, this sample was comprised of young, university town residents who were predominantly White. We know from MacAndrew and Edgerton (1969) that the cultural context of the drinking episode and the society, more generally, may have a greater influence on drinkers' drunken comportment than the physiological effects of the alcohol itself. Their documentation revealed, for example, that members of Yuruna Indian tribe in Xingu, Brazil, became collectively reserved and sleepy after large doses of alcohol. In some cultures, singing, dancing, or displaying aggression after drinking were unheard of. These descriptions are in stark contrast to the idea of drunkenness adopted by Western cultures. Moreover, the Extraversion finding from the RBQ could be attributed to the high number of RBQ items that permitted more highly resolved rating of this trait and its facets. Specifically, Extraversion had 30 items, far more than the other factors, and taking a mean of this large number of items results in Extraversion scores having much greater reliabilities, thus increasing the potential for finding significant differences. However, because this difference was found among all five measures in this study, there is reason to believe that the RBQ finding would have been obtained even with fewer items assigned to that factor.

Last, we cannot rule out the effect of alcohol outcome expectancies on participants' self-reported drunk personalities, which could contribute to the discrepancies between these reports and those of the observers (who were blind to condition and thus presumably not assigning personality ratings based on expectations of drunk expression). Though distinguishing the pharmacological from non-pharmacological effects of alcohol was not an aim of this study – as these are not separated during “real life” drinking experiences, and prior group alcohol administration studies have found negligible differences between placebo and control conditions (Fairbairn et al., 2015; Sayette et al., 2012), we nevertheless acknowledge that the lack of a placebo condition precluded our ability to distinguish pharmacological and expectancy effects..

Clinical Implications and Future Research Directions

These results, as well as the concept of “drunk personality” more broadly, hold promise for developing novel assessment-based and motivational interventions for problem drinkers, as well as future empirical investigation. Concerning clinical practice, practitioners could assess clients' reported typical levels of their FFM personality traits for sober and intoxicated states, the alcohol-related consequences they have experienced, and their views of their ideal self, or how they aspire to be (Heidrich, 1999). Through the use of a personalized feedback intervention, the clinician could discuss the traits that appear to change and the specific behaviors they have engaged in when under the influence. This information could be presented with the aim of developing discrepancies between the clients' current behavior and how they see themselves or hope to be. Essentially, the assessment of clients' unique “drunk personality profiles” would provide a personalized link between their drinking episodes and the resulting problems, and open the door for a tailored discussion about how their drinking, personality expression, and drunken behaviors are intertwined.

Regarding future research, an ambitious direction of this work could include the application of the FFM to drunk personality as it is displayed across the world and examination of the similarities and differences among FFM profiles across a wider range of cultures and situations than what was captured in our sample and laboratory-based setting. Concerning the further study of the global changes in personality and compoment associated with intoxication (McAndrew & Edgerton, 1969), efforts should be directed towards the creation of novel, behavior-based assessments of pathological alcohol use. Before that can be done, scholars need a better sense of the role and scope of alcohol-related personality change. Though relatively short self- and observer-reported scales were used in this study to measure personality elicited by participation in brief tasks, we still lack knowledge of what the optimum content and format would be for in-vivo personality assessment in the context of a clinical study. For example, we need to more sensitively probe the extent of alcohol-induced changes using behavioral tasks demonstrated to be sensitive in their assessment of each of the five factors, as the battery implemented in this investigation may have disproportionately elicited exhibitions of Extraversion. Going forward, researchers should focus on the development and evaluation of behavioral tasks designed to measure stress and anxiety (Neuroticism), perseverance and planning (Conscientiousness), conformity and hostility (Agreeableness), and creativity (Openness).

Conclusions

This study expanded on previous self- and informant-reported research on “drunk personality” by demonstrating strongly for Extraversion and more conditionally for Neuroticism that alcohol administration ostensibly leads to changes in self-perceptions of personality, as well as actual behavior that results in others forming reliably different impressions of individuals’ personality. These findings also demonstrate that, in general, self-perceptions of sober versus intoxicated personality differences are more pervasive than what can be observed within a laboratory drinking environment, but that alcohol-induced increases in Extraversion are robust enough to be detected across measures and reporters, with decreases in Neuroticism noted across a more limited set of measures. We see the present findings as demonstrating the viability of viewing drunken compoment through the lens of personality theory, a perspective that opens up new research opportunities with important implications for clinical assessment and related treatment interventions.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This project could not have been completed without the valuable work from talented and committed undergraduate research assistants. The following individuals made necessary contributions to the processes of pilot testing, participant recruitment, coordination and running of testing sessions, and/or data entry and organization: Brendon Woody, Blaine Steck, Emma Fullerton, Hannah Clements, Kelly Winkler, Jennifer Mink, Kenny Freeman, Merryum Munir, Mackenzie Graville, Nicole Kagan, Andy Rosenberg, Paulette Chavez, Jen Hall, Claire Bevilacqua, Callandria Frazier, Seth Scarborough, Lauren Mackay, Dana Pounds, Alexa Loveday, Amanda Behnke, Amber Reeves, Katie Huddlestonsmith, Tabitha Tetro, Scott Howell, Matt Rundle, and Taylor Green.

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Appendix

RBQ items (abbreviations in bold, used in Table S1):

1. Interviews others (if present) (e.g., asks a series of questions) -- **Interv**
2. Volunteers a large amount of information about self -- **VoInfo**
3. Seems interested in what someone had to say -- **SeemInt**
4. Tries to control the situation (Disregard whether attempts at control succeed or not.) -- **Control**
5. Dominates the situation (Disregard intention, e.g., if P dominates the situation by default because the other(s) present does very little, this item should receive high placement.) -- **Domin**
6. Appears to be relaxed and comfortable -- **Relaxd**

7. Exhibits social skills (e.g., makes other(s) comfortable, keeps conversation moving, entertains or charms others(s) -- **Social**
8. Is reserved and unexpressive (e.g., expresses little affect; acts in a stiff, formal manner) -- **Reserved**
9. Laughs frequently (Disregard whether laughter appears to be nervous or genuine.) -- **Laughs**
10. Smiles frequently -- **Smiles**
11. Engages in physical activity. (e.g., works up a sweat) (Low placement=almost completely sedentary.) -- **PhyActv**
12. Seems to like other(s) present (e.g., would probably like to be friends with them) -- **Likeoth**
13. Exhibits an awkward interpersonal style (e.g., seems to have difficulty knowing what to say, mumbles, fails to respond to conversational advances) -- **AwkInt**
14. Shows high enthusiasm and a high energy level -- **Enths**
15. Shows a wide range of interests (e.g., talks about many topics) -- **WideRng**
16. Talks at rather than with others (s) (e.g., conducts a monologue, ignores what other(s) says) -- **TalkAt**
17. Expresses agreement frequently (High placement=agreement is expressed usually often, e.g., in response to each and every statement partner (s) makes. Low placement=unusual lack of expression agreement.) -- **Agree**
18. Expresses criticism (of anybody or anything) Low placement=expresses praise.) -- **Criticism**
19. Is talkative. (as observed in this situation) -- **Talk**
20. Expresses insecurity (e.g., seems touchy or overly sensitive) -- **ExpIns**
21. Shows physical signs of tension or anxiety (e.g., fidgets nervously, voice wavers) (Middle placement=lack of signs of anxiety. Low placement=lack of signs under circumstances where you would expect them.) -- **PhyTens**
22. Exhibits a high degree of intelligence (Give this item high placement only if P actually says or does something of high intelligence. Low place=exhibition of low intelligence. Medium placement=no information one way or the other.) -- **Intel**
23. Expresses sympathy (to anyone, i.e., including conversational references) (Low placement=unusual lack of sympath.) -- **Sympath**
24. Initiates humor -- **IniHumr**
25. Seeks reassurance (e.g., asks for agreement, fishes for praise) -- **Reass**
26. Exhibits condescending behavior (e.g., acts as if self is superior to other(s) [present, or otherwise] (Low placement=acting inferior) -- **Condes**

27. Seems likable (to other(s) present) -- **Likable**
28. Seeks advice -- **SkAdv**
29. Appears to regard self as physically attractive -- **PhyAtt**
30. Acts Irritated -- **Irrt**
31. Expresses warmth (to anyone, e.g., including affectionate references to close friends, etc.) -- **Warmth**
32. Expresses hostility (no matter toward whom or what) -- **Hostil**
33. Is unusual or unconventional in appearance -- **Unusual**
34. Behaves in a fearful or timid manner -- **Timid**
35. Is expressive in face, voice, or gestures -- **Express**
36. Expresses guilt (about anything) -- **ExGlt**
37. Keeps other(s) at a distance; avoids development of any sort of interpersonal relationship. (Low placement=behavior to get close to other(s.) -- **Distnce**
38. Exhibits a high degree of intelligence (Give this item high placement only if P actually says or does something of high intelligence. Low place=exhibition of low intelligence. Medium placement=no information one way or the other.) -- **Intelct**
39. Seems to enjoy the situation -- **EnjSit**
40. Shows interest in intellectual or cognitive matters (discusses an intellectual idea in detail or with enthusiasm) -- **SayDoInt**
41. Says negative things about self (e.g., is self-critical; expresses feeling of inadequacy) -- **NegSlf**
42. Displays ambition. (e.g., passionate discussion of career plans, course grades, opportunities to make money) -- **Ambit**
43. Blames others (for anything) -- **BlmOth**
44. Expresses self-pity or feelings of victimization -- **SlfPit**
45. Expresses sexual interest. (e.g. acts attracted to someone present; expresses interest in dating or sexual matters in general) -- **Sexint**
46. Behaves in a cheerful manner -- **Cheer**
47. Gives up when faced with obstacles (Low placement implies unusual persistence) -- **Giveup**
48. Behaves in a stereotypically masculine style or manne. -- **Masc**
49. Offers advice -- **OffAdv**
50. Speaks fluently and expresses ideas well -- **ExpIdea**

51. Behaves in a competitive manner (Low placement=cooperation) -- **Compet**
52. Speaks in a loud voice -- **Loud**
53. Speaks sarcastically (e.g., says things (s)he does not mean; makes facetious comments that are not necessarily funny) -- **Sarcas**
54. Makes or approaches physical contact with other(s) (of any sort, including sitting unusually close without touching) (Low placement=unusual avoidance of physical contact, such as large interpersonal distance) -- **Contact**
55. Seems detached from the situation -- **Detach**
56. Speaks Quickly (Low placement=speaks slowly) -- **SpkQ**
57. Acts Playful -- **Play**
58. Other(s) seek advice from P -- **OthAdv**
59. Concentrates on or works hard at a task -- **Concen**
60. Exhibits physical discomfort or pain. (High placement=excess of what seems proportionate. Low placement implies lack of these signs where expected) -- **PhyPain**
61. Behaves in a stereotypically feminine style or manner -- **Femin**

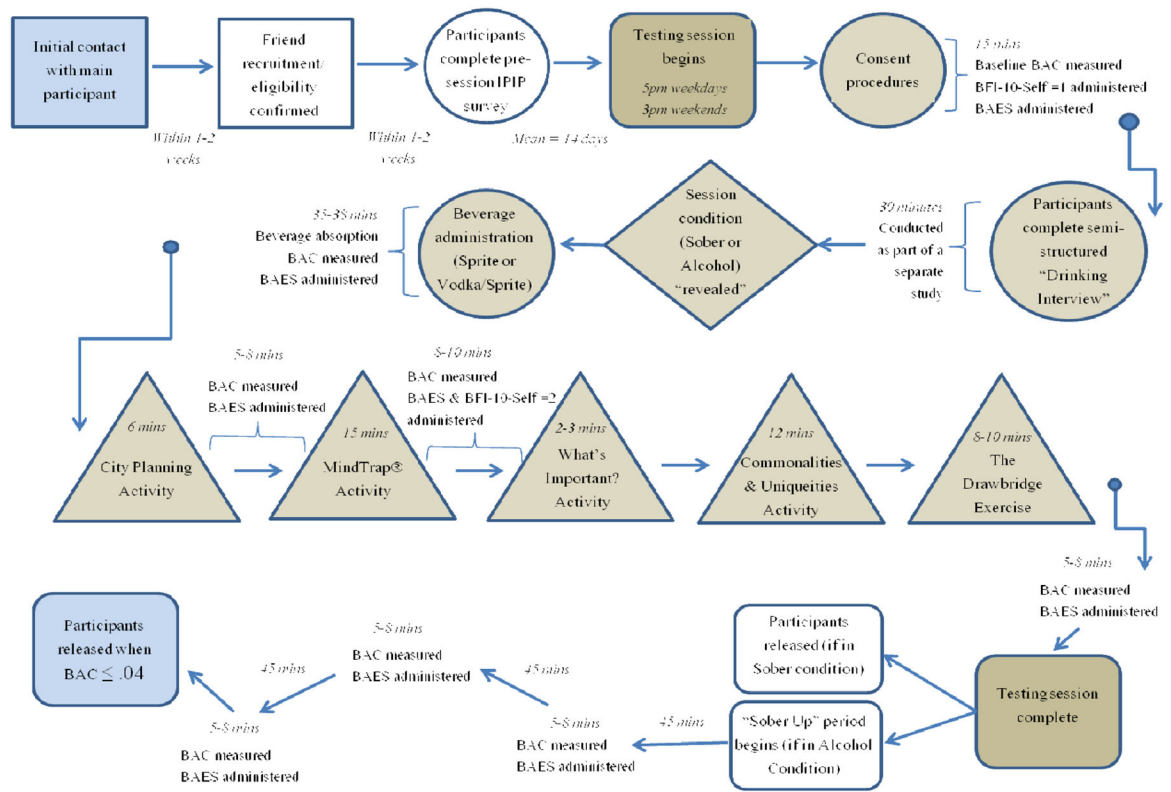


Figure 1.
Flow of experiment from initial contact to end of study participation

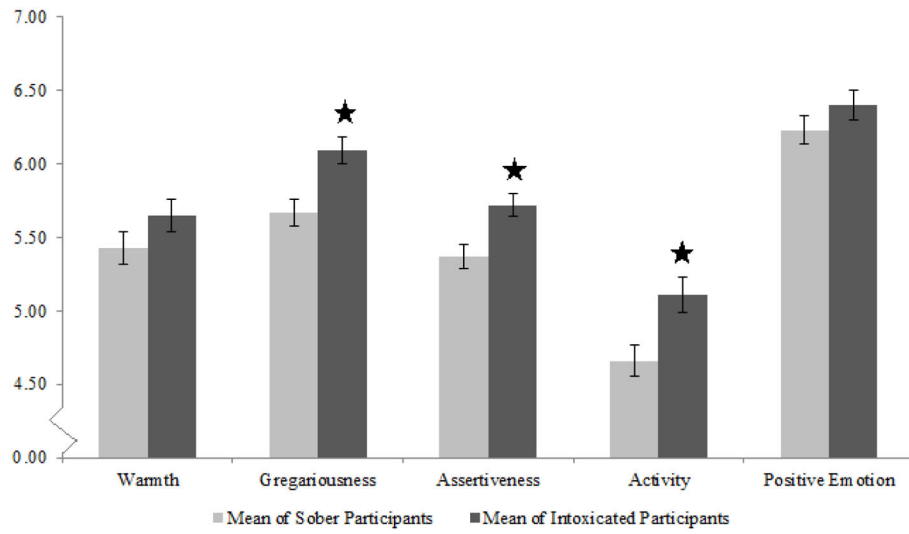


Figure 2.
Extraversion facet differences in Sober and Alcohol condition
Note: ★ = Sober and Alcohol condition least squares means differ at $p < .01$

Table 1

Summary of testing session activities

Session Activity	Length	Summary	Intended Attributes Elicited
City Building Activity	5 minutes	As a group, agree on the six most essential public buildings that a city of 20,000 residents must have. Nominate one person to read the group's answers aloud.	Submissiveness, Assertiveness, Creativity, Intellect, Perfectionism
MindTrap® Activity	15 minutes	As a group, agree on answers to a series of lateral thinking logic questions and puzzles. Groups have five minutes to provide a correct answer or "pass."	Competitiveness, Persistence, Fearlessness, Helpfulness, Open mindedness, Dominance, Enthusiasm, Achievement orientation
What's Important? Activity	30 seconds per person	Participants respond to the open- ended "What's important to you? Feel free to talk about things big or small, and be as honest as you can be."	Sentimentality, Attention-seeking, Gregariousness, Solemnity, Insecurity
Commonalities & Uniquities Activity	6 minutes for each list (12 minutes total)	As a group, compile a list of eight things all participants have in common and eight things that are unique to each member. Six minutes are given to construct each list.	Willingness to engage, Creativity, Dominance, Vulnerability, Social withdrawal
The Drawbridge Exercise	5 minutes for individual responses, 5 minutes for group agreement	Participants listen to a story about a murdered Baroness and decide, both individually and as a group, who was most and least at fault for her death.	Empathy, Callousness, Suspiciousness/ Trust, Irritability, Curiosity, Antagonism

Table 2

Condition differences by reporter, measure, and factor

	Extraversion		Agreeableness		Conscientiousness		Neuroticism		Openness		
	Sober	Alcohol	Sober	Alcohol	Sober	Alcohol	Sober	Alcohol	Sober	Alcohol	
Self-reported	IPIP	3.63 (.70)	4.15 ⁺ (.57)	4.09 (.53)	3.73 ⁺ (.65)	3.70 (.64)	2.59 ⁺ (.68)	3.43 (.77)	3.69 ⁺ (.62)	4.01 (.51)	3.29 ⁺ (.60)
	BFI-10-Self	3.88 (.07)	4.12* (.07)	3.84 (.06)	3.93 (.06)	3.86 (.06)	3.58* (.06)	2.55 (.07)	2.27 [^] (.08)	3.98 (.08)	3.69 [^] (.09)
Observer-reported	Thin Slice	5.97 (.13)	6.38* (.13)	6.55 (.12)	6.43 (.12)	5.83 (.13)	5.84 (.14)	3.30 (.14)	3.42 (.14)	5.07 (.15)	5.26 (.15)
	BFI-10-Observer	3.41 (.09)	3.85 [^] (.09)	3.42 (.07)	3.28 (.09)	3.50 (.09)	3.50 (.09)	2.61 (.06)	2.53 (.07)	3.28 (.10)	3.29 (.10)
RBQ	5.49 (.07)	5.85 ⁺ (.07)	5.83 (.09)	5.64 (.09)	5.86 (.12)	5.76 (.12)	4.07 (.06)	3.87* (.07)	5.27 (.13)	5.28 (.14)	

Note. IPIP = 50-item scale from Goldberg's International Personality Item Pool; BFI-10-Self = Big Five Inventory – 10 item, self-reported; BFI-10-Observer = Big Five Inventory – 10 item, observer-reported; RBQ = Riverside Behavioral Q-sort; Neuroticism for IPIP represents Emotional Stability (inverse of Neuroticism). Number at top of cell = condition mean (IPIP only) or least squares mean; Number on bottom of cell = standard deviation (IPIP only) or standard error; Cells highlighted in gray = Sober and Alcohol means (or least squares means) are significantly different;

* *p* .05;
[^] *p* .01;
⁺ *p* .0001.