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You Drink, I Drink: Alcohol Consumption, Social Context and Personality

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ABSTRACT - 30 drinkers (oversampled for heavier drinking, from within an undergraduate sample of 60) were assessed with the NEO-FFI, queried regarding weekly self-reported habitual drinking behavior, and subjected to an alcoholic beverage sham taste-test, in a randomly-paired dyad. Extraverted, emotionally stable individuals reported more habitual drinking occasions per week (r = .61, p < .002, for the combination of traits), but not more drinks/occasion, or drinks per week. Personality did not predict total lab alcohol consumption, but such consumption was strongly influenced by total lab alcohol consumption of the drinking partner (r = .52, p < .001). Median split of participants revealed that the effect of such social influence was substantively enhanced among individuals high in each of agreeableness and extraversion, with a strong trend for openness. Normative social drinking behavior appears strongly influenced by social context. The effect of such context, in turn, appears moderated by personality.

Male gender, antisocial personality, family history of alcohol abuse or dependence and relative youth all increase the probability of high dose alcohol consumption and abuse (Pihl & Peterson, 1995). Individual differences in personality, *per se*, also play a role. Risk for alcohol or drug abuse has been classically associated, for example, with high scores on Eysenck's Psychoticism and Neuroticism dimensions (S.B.G. Eysenck & Eysenck, 1977) – traits that, with the inclusion of Extraversion, make up the well regarded P-E-N model. In keeping with these classic findings, Conrod, Peterson and Pihl (1997) recently assessed the relationship between trait personality and self-report/laboratory alcohol consumption in a group of social drinking males at high and low familial risk for alcoholism. They concluded that trait psychoticism was indeed positively and powerfully related to self-report and to laboratory sham taste-test alcohol consumption, as well as to increased likelihood of social/behavioral problems, consequential to alcohol use. Elevated scores on Cloninger's less psychometrically validated Novelty-Seeking scale (briefly reviewed in Sher,

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Bartholow & Wood, 2000), popular among psychiatrists, and the presence of Zuckerman, Kuhlman, Joireman, Teta and Kraft's (1993) sensation-seeking, variously measured, also appear associated with higher levels of alcohol and/or drug use or abuse (Andreasson, Allebeck, Brandt & Romelsjo, 1992; Conrod, Pihl, Stewart & Dongier, 2000; Earleywine & Finn, 1991; McMillen, Pang, Wells-Parker & Anderson, 1992; Sher et al., 2000; Stacy, Newcomb & Bentler, 1991).

Five factor models of trait personality, well constructed psychometrically, have become increasingly popular among personality researchers, in the psychological field, in recent years. The most well-defined five orthogonal factors – *Extraversion*, *Neuroticism*, *Conscientiousness*, *Agreeableness* and, finally, *Openness to Experience* – appear characterized by consistent replicability (using diverse measures and samples), temporal stability, cross-observer validity, practical utility, and partial heritability (Costa & McCrae, 1992a; Goldberg, 1993). Eysenck (1992), resisting the move to a five factor model, regarded agreeableness and conscientiousness as components of his Psychoticism trait, which is associated, in turn, with sensation-seeking (Zuckerman et al., 1993; Zuckerman, 1995), while Cloninger's Novelty-Seeking appears, at least at the item level, very much like Extraversion.

In logical keeping with these linkages, Schall, Kemeny and Maltzmann (1992) concluded that extraverted sensation seekers with high levels of trait psychoticism were at particular risk for heavy drinking, while Allsop (1986) reported the existence of a positive relationship between extraversion, psychoticism and alcohol consumption. Paunonen (2001) has recently demonstrated that extraversion is positively and conscientiousness negatively related to self-report alcohol consumption among undergraduates (the former at $r \sim .25$; the latter at $r \sim -.22$), using the NEO-Five Factor Inventory , a well-validated and reliable short Big Five Measure (Costa & McCrae, 1992b). So it appears, across all these studies, that a variety of personality traits may affect alcohol consumption – most particularly, high neuroticism and extraversion, and low agreeableness and conscientiousness or high psychoticism/sensation-seeking.

One might almost forget, however, while examining the individual differences literature, that alcohol is a social drug, and that its consumption almost always takes place in a social situation. This is an important, even vital, caveat, given that trait variables are rarely correlated more than about .30 with a given behavior (Mischel, 1968) (even though that .30 is far from trivial (Schmidt & Hunter, 1998)), and that situational variables apparently make up a large part of the remaining determinants. For these reasons, among others, theorists such as Donald (1991) and Peterson (1999) have recently stressed the importance of mimicry or matching in the general regulation of social behavior, while experimentalists have demonstrated strong social influence over consummatory behaviors such as eating (reviewed in Herman, Roth & Polivy, 2003) and over a variety of more general attitudes and actions, particularly among "empathic"

individuals (Chartrand & Bargh, 1999). It is of some interest to note, as well, that the neurocircuitry underlying such matching has recently been identified (Rizzolatti, Fogassi & Gallese, 2001).

In consequence, both individual difference and contextual variables should predict levels of alcohol consumption, in the typical social drinking situation. However, little systematic study of the relationship between personality variables and alcohol or drug use has yet been conducted, particularly in a social situation. The current study was therefore designed to examine the relationship between personality traits, using a well-validated big five trait questionnaire measure and social drinking habits, self-report and laboratory. We were particularly interested in the possible contributions of agreeableness and extraversion to social drinking behavior, given the social dimensions of these two measures (Costa and McCrae, 1992a; Goldberg, 1993), although we also determined to assess the possible contribution of the remaining three.

Method

The 10 lowest and 20 highest drinkers from a moderate drinking sample of 60 male undergraduates participated in this experiment. Males were chosen because of their clearly elevated risk (approximately 5:1) for the development of alcohol problems (Pihl & Peterson, 1995). Participants were first screened by telephone, regarding their drinking behavior, and were classified into low and high drinking. All screened individuals were ineligible for the study if they had scores of > 5 on the Michigan Alcoholism Screening Test (MAST; Selzer, 1971), although no participants exceeded that criterion. High drinkers were oversampled, two to one, to ensure a broad distribution of moderate social drinking behavior, despite the low sample size.

Upon arrival at the lab, within a month of initial screening, participants completed a questionnaire assessing self-reported habitual drinking behavior (Conrod et al., 1997), and the NEO-FFI (Costa & McCrae, 1992b), a highly reliable and valid Big Five self-report questionnaire, employing 12-item scales and Likert-type indicators to assess each of the standard five dimensions. Finally, participants were subjected to a sham taste-test (Marlatt, Demming & Reid, 1973), in a randomly-paired dyad. All participants were asked to refrain from eating for four hours and drinking alcohol for 24 hours prior to the study. Each subject was paid $5/hour for his participation. Average age and habitual drinking history for the 30 participants is presented, averaged across the two screening sessions, in Table 1.

Participants were first told that they were participating in a study on the effects of social interaction on taste preference. Then they were placed in a comfortable, lounge-like room, with popular music playing in the background, and were offered four different beverages: orange juice, rum and coke, vodka and orange juice, whisky and ginger ale. The alcoholic drinks consisted of 80 ml of liquor and 320 ml of mixer. The two nonalcoholic drinks consisted of 400 ml water and orange juice. The 400 ml beverages were placed in identical 1 liter

bottles. Water (400 mls) was also provided, to "cleanse the palate." Participants were asked to rate the beverages using a list of 16 computer-presented adjectives. Each adjective remained on the screen for 120 seconds. Participants were told to drink as much, or as little, of each beverage as required, to make an accurate judgment of taste. Total amount of alcohol consumed was calculated (in mls), after the drinking session ended.

Results

Age and Drinking History: Table 1 presents age, self-report habitual drinking measures (averaged across the telephone screening interview and the lab questionnaire) and lab alcohol measures for the low and high drinking groups. Test-retest reliability across the two assessment periods, conducted within one month, was r = .83 for drinking occasions/week, r = .54 for average BAL/occasion (calculated in accordance with Conrod et al., 1997), r = .80 for drinking quantity/occasion, and r = .67 for drinking hours/occasion (all p's < .001). The low and high drinking groups differed significantly in average estimated BAL per occasion, drinking quantity/occasion, and drinking hours/occasion, as expected. The high drinkers also manifested higher BALs in the lab drinking situation, a consequence of their trend towards increased consumption (also portrayed in Table 1).

Table 1
Age and Drinking History

Mean (SD)	Low (n=10)	High (n=20)	Total (n=30)
Age	21.7 (0.95)	22.0 (1.56)	21.9 (1.37)
HABITUAL DRINKING MEASURES:			
Drinking Occasions/Week	2.50 (1.49)	1.90 (0.92)	2.10 (1.15)
Average BAL/occasion***	.046 (.027)	.124 (.033)	.098 (.048)
Drinking Quantity/Occasion***	3.18 (1.45)	6.83 (1.62)	5.61 (2.33)
Drinking Hours/Occasion***	2.18 (0.94)	3.55 (0.75)	3.09 (1.04)
LABORATORY DRINKING MEASURES:			
Total Alcohol Self (mls)+	78.8 (56.6)	116.2 (63.6)	103.78 (62.99)
BAL*	.022 (.011)	.039 (.032)	.034 (.028)

*** p < .001 ** p < .01 * p < .05 +p < .10

Personality and Drinking History: Zero-order correlational analyses revealed significant relationships between emotional stability (neuroticism reversed, for the sake of directional consistency) and drinking occasions/week (r = .51, p < .001), as well as average drinks/week (average of screening drinks/occasion x screening drinking occasions/week and questionnaire drinks/occasion x questionnaire drinking occasions/week) (r = .38, p < .03). Similar results emerged for extraversion and drinking occasions/week (r = .45, p < .006), as well as average drinks/week (r = .36, p < .03). All other correlations between drinking history and personality were non-significant, p > .05. Regression

analysis, using extraversion and emotional stability jointly to predict drinking/occasions per week, revealed $r = .61$, $p < .002$, emotional stability $\beta = .42$, $t = 2.67$, $p < .013$, extraversion $\beta = .334$, $t = 2.10$, $p < .045$. It is of some interest to note that drinking occasions/week was the only habitual drinking measure not significantly elevated among the heavier drinkers.

Personality and Lab Drinking: There were no significant zero-order correlations between any of the personality traits and total alcohol consumed during the taste test procedure, with or without partial control for amount of water consumed, which was nonsignificantly correlated with total alcohol consumed at $r = .22$, $p < .22$.

Drinking History, Social Influence, and Lab Drinking: The zero-order correlations between measures of drinking history, social influence, and lab drinking are presented in Table 2. Powerful and significant relationships emerged between total alcohol consumption by self and total alcohol consumption ($r = .52$, $p < .001$) and BAL ($r = .39$, $p < .02$) by partner. The absence of significant relationships between the habitual drinking measures and lab drinking measures is notable.

Table 2
Lab Consumption: Zero-Order Correlations between Total Alcohol and BAL: Self and Other

	1	2	3	4	5	6
1. Average Drinks/wk	-	.55**	.14	.10	.20	.26
2. Average BAL/occasion		-	.17	.15	.18	.23
3. Total Alcohol Partner, Lab			-	.90**	.52**	.32*
4. BAL Partner, Lab				-	.39*	.24
5. Total Alcohol Self, Lab					-	.88**
6. BAL Self, Lab						-

***p < .001 *p < .05

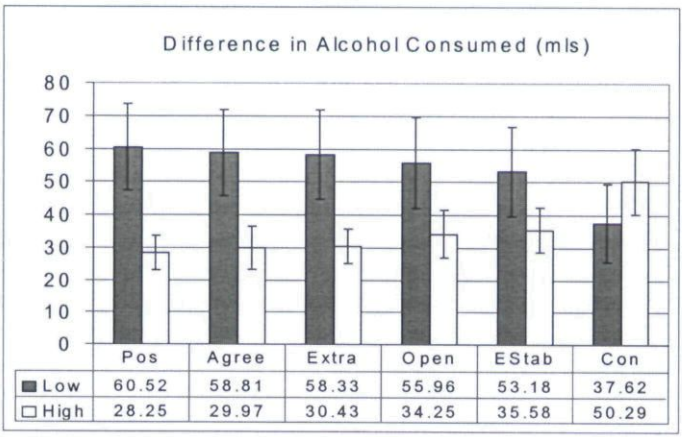
A number of additional calculations were performed, to assess the potentially modifying effect of personality on this pronounced social influence. First, we calculated an index for Difference in Alcohol Consumed by taking the absolute difference between self and partner total alcohol consumption (in mls) ($X = 44.38$, $SD = 41.68$). Second, we divided participants into low and high groups, based on mean scores for each of the five factor traits. We also calculated a "positive personality" index, by averaging the z-scores for each of the five traits (1) because of the fact that Big Five traits, although orthogonal when factor-analyzed at the level of the question, tend to be positively correlated at the trait-

measure level, in the direction one might expect (DeYoung, Peterson & Higgins, 2002) and (2) because visual inspection of the differences reported immediately below indicated similar effects across the five traits, in accordance with their standard positive correlations. Finally, we performed independent groups *t*-tests on the Difference in Alcohol Consumed measures for all six groups (Low/High positive personality, agreeableness, extraversion, openness, emotional stability and conscientiousness).

Means and standard errors are portrayed graphically in Figure 1. Participants with comparatively elevated scores on the six personality indices of interest differed significantly less than those with comparatively decreased scores in the case of *overall positive personality* (Cohen's $d = .83$, $r = .38$, t ($df_{18.4}$, unequal variance) = 2.27, $p = .018$, low group $SD = 51.17$, high group $SD = 20.55$), *agreeableness* (Cohen's $d = .73$, $r = .34$, t ($df_{20.9}$, unequal variance) = 1.99, $p = .030$, low group $SD = 49.92$, high group $SD = 25.71$), and *extraversion* (Cohen's $d = .53$, $r = .26$, t ($df_{18.2}$, unequal variance) = 1.92, $p = .036$, low group $SD = 52.50$, high group $SD = 20.62$). There was a clear trend in the same direction for *openness* (Cohen's $d = .52$, $r = .25$, t (df_{28}, equal variance) = 1.45, $p = .079$, low group $SD = 51.32$, high group $SD = 29.01$). Differences for *emotional stability* (low group $SD = 58.33$, high group $SD = 30.43$) and *conscientiousness* (low group $SD = 44.39$, high group $SD = 39.63$) were not significant.

Figure 1

Absolute Difference in Alcohol Consumed (mls) Between Individuals in Dyadic Pairs, by High/Low Positive Personality, Agreeableness, Extraversion, Openness, Emotional Stability (Neuroticism Reversed) and Conscientiousness



Note: $p < .05$ for Pos, Agree, Extra $p < .10$ for Open

Discussion

This study indicated, most importantly, that social matching plays a powerful role in regulating alcohol intake among non-alcoholic social drinkers drinking in a social situation – even when those individuals are strangers, brought together for reasons putatively other than the effects of alcohol. The $r = .52$ for such matching places its effect in the top 5th percentile of reported effect sizes among published behavioral research papers (Hemphill, 2003). It is interesting to note, as well, that although the heavier habitual drinkers did reach higher BAL's in the lab, and showed a strong trend towards consuming alcohol, the overall analyses of the effects of habit and social context clearly demonstrate that social context was the more powerful determinant of drinking behavior. Since this study had a small sample size, however, it would be worth replicating, to ensure that the results reported are stable.

Furthermore, no main effects for Big Five personality traits were evident, with regards to lab alcohol consumption, although emotionally stable and extraverted individuals tended to drink substantially more frequently during the week. This probably reflects their sociable and untroubled natures more than any tendency towards alcohol abuse (particularly given the non-significant effects for average drinks/occasion and average drinks/week). This is certainly not to say that personality played no role in governing dyadic drinking behavior. More agreeable, extraverted, open individuals were more likely to match their partner's drinking behavior closely than their less agreeable, introverted and closed counterparts. The r for these differences, averaging .33, places this effect in upper end of the middle third of published behavioral research papers (Hemphill, 2003).

What all this seems to indicate is that individuals drinking socially tend to drink as much as their peers, particularly if they are sociable, agreeable, open, positive people. Logically, such people are likely to both pay attention to their social milieu, and to make an attempt, consciously or unconsciously, to accommodate themselves to that milieu. Less sociable, agreeable and open people tend to pay less attention, or to go their own way. What this study did not reveal is why some dyads drink less, and others more. Is it possible that intrinsic risk factors for alcohol abuse may drive some in the direction of higher consumption, and that such individuals are then capable of unduly influencing their social group? If such were the case, then even genetically-determined predispositions to alcohol abuse might have a perniciously spreading social influence. Alternatively, it could be that such predispositions might frequently be brought under social control, in the appropriate milieu. The investigation of such complex interactions awaits future studies.

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