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A Comparison of Descriptive and Injunctive Norms Brief Interventions for College Drinkers

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Abstract

College drinking remains a major public health concern. One contributing factor is the overestimation by college students of their peers' alcohol use (DN: descriptive norm) and their peers' acceptability of excessive drinking (IN: injunctive norm). Normative re-education interventions have traditionally focused on changing descriptive norms even though the Theory of Normative Conduct identifies both DN and IN as beliefs that motivate behavior. The current study developed a brief, manualized, personalized, IN intervention, delivered face-to-face, in a Motivational Interviewing style that can be used as a stand alone treatment or added to existing descriptive norms interventions. This randomized controlled trial compared the efficacy of the newly developed IN intervention against a DN only condition, a combined DN and IN condition, and an assessment only control condition. In addition, the current study examined actual-ideal discrepancy, and positive and negative affect as potential mechanisms of behavior change following norms feedback. The results indicated that all three norms intervention conditions changed both DN and IN equally. In addition, heavy drinking students reported greater reductions in drinking following the IN only or the combined intervention then heavy drinking students in the DN only condition. Tests of indirect effects from treatment condition to actual-ideal discrepancy to positive or negative affect to alcohol use and consequences were only significant for light drinkers. This study provides evidence that changes in DN and IN result from either form of feedback, and that these changes do not necessarily result in changes in drinking. Further, changes in actual-ideal discrepancy were highly associated with affective changes, but affective changes were not associated with outcomes.

A Comparison of Descriptive and Injunctive Norms Brief Interventions for College Drinkers

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A Comparison of Descriptive and Injunctive Norms Brief Interventions for College Drinkers

Approximately half of the over 8,000,000 college students in the United States consume alcohol and experience a variety of associated negative consequences in areas such as academic, social, and health functioning (Hingson, Zha, & Weitzman, 2009). In this regard, among college students, excessive drinking results in over 1,800 deaths per year (Hingson, Zha, & Weitzman, 2009), as well as poor academic performance, risky sexual behavior, and personal injury for many more (Wechsler & Nelson, 2008). Accordingly, there is a need to improve the magnitude of effectiveness of available risk reduction interventions.

Most college students overestimate the amount of alcohol that their peers consume (i.e., descriptive norms), as well as the permissiveness of the social environment with regard to risky drinking behaviors (i.e., injunctive norms) (Borsari & Carey, 2003). These exaggerated perceptions are associated with heavier drinking (Lee, Geisner, Lewis, Neighbors, & Larimer, 2007). Fortunately, empirical studies consistently demonstrate that correcting students' perceptions of peer drinking (known as normative re-education) promotes decreases in consumption (Carey, Henson, Carey, & Maisto, 2010). Therefore, normative re-education is an empirically supported risk reduction strategy and may serve as the basis for building more efficacious interventions for college drinkers.

Normative feedback has been shown to be more effective under certain conditions. First, a recent meta-analysis showed the personalized feedback was more effecting in producing significant changes in alcohol use and consequences compared to feedback that was not personalized (Scott-Sheldon et al., 2014). Second, Walters, Vader, Harris, Field, and Jouriles

(2009) demonstrated that personalized feedback is more powerful when delivered face-to-face compared to feedback presented online or mailed. Third, feedback is most effective when delivered using a Motivational Interviewing style (Murphy et al., 2010). Finally, research has shown that selecting an appropriate referent group is critical for facilitating behavior change in norms feedback interventions (c.f., Neighbors et al., 2008).

Cialdini, Reno, and Kallgren (1990) define social norms as consisting of two parts affecting human motivation, (a) the "is" (Descriptive Norm) defines what is normal behavior, and (b) the "ought" (Injunctive Norm) defines what is morally sanctioned behavior. The theory of normative conduct (Cialdini, Reno, and Kallgren, 1990) proposes that normative perceptions provide a shortcut that guides decision-making. For example, students may think that if everyone is doing a certain behavior, then it must be an appropriate and reasonable behavior. Some students may even believe that the normative behavior is an expected behavior to do or be sanctioned by one's peers.

Even though exaggerated perceptions of both descriptive norms (DN) and injunctive norms (IN) are prevalent (Perkins, Haines, & Rice, 2005) and are both independently associated with greater alcohol consumption (Lee, Geisner, Lewis, Neighbors, & Larimer, 2007), the vast majority of social-norms based interventions focus on changing DN alone (Lewis & Neighbors, 2006). Among DN interventions personalized feedback delivered to individuals has been shown to be effective in facilitating short-term reductions in alcohol consumption both using in-person (Borsari & Carey, 2000) and web-based (Neighbors, Larimer, & Lewis, 2004) intervention formats. Moreover, interventions that target DN feedback as a primary intervention component are more successful in reducing drinking in college samples than skills training or expectancy

challenge interventions (Carey et al., 2007). Finally, the effects of DN interventions tend to peak around 6-weeks and wear off by around 6-months post intervention (Carey et al., 2007).

Only two alcohol prevention studies evaluated facilitator-led group interventions designed to change IN with mixed results (Barnett, Far, Mauss, & Miller, 1996; Schroeder & Prentice, 1998). Barnett and colleagues (1996) demonstrated changes in both DN and IN immediately following a combined DN + IN feedback, whereas Schroeder and Prentice (1998) only found changes for males in perceived norms following either a discussion about pluralistic ignorance or an individualized discussion about responsible decision making at a 4- to 6-month follow-up. These interventions had a number of methodological limitations that preclude strong inferences to be made based on their results.

More recently, Prince & Carey (2010) demonstrated that perceptions about other student's acceptability of excessive drinking (i.e., perceived injunctive norms) could be changed with brief feedback about students' true attitudes about excessive drinking. This study also showed that in response to receiving feedback solely about injunctive norms, students also changed their perceived descriptive norms. The authors suggested a correspondence bias that students may have been using when changing their perceptions. Specifically, participants generalized the information that students' disapprove of excessive drinking to modify their estimates of students' alcohol consumption. This study provides a proof of concept that perceived injunctive norms are amenable to change with brief feedback. However, this study does not link those changes in perception to changes in alcohol use or consequences.

Larimer (2012) is currently taking the next step. At the Research Society on Alcoholism's Annual conference she presented a large scale, multi-site web-based study examining the effects

of injunctive norms feedback in contrast to descriptive norms feedback and in contrast to the combination of the two forms of feedback (Larimer, 2012). Preliminary results indicated that injunctive norms feedback outperforms both descriptive norms only feedback and the combined injunctive and descriptive norms feedback in reducing alcohol consumption. The differential performance of DN and IN feedback in Larimer's (2012) study, promotes the idea that descriptive and injunctive norms are separate constructs. This notion was put forth previously by Lee et al (2007), who demonstrated that the relationship between descriptive norms and alcohol use is moderated by injunctive norms, such that the association between students' perception of how much their peers are drinking and their own personal drinking is stronger among students who also believe that their peers approve of excessive drinking. There is growing interest in the role of injunctive and descriptive norms as separate constructs and separate targets for intervention. Recently, Merrill, Carey, Reid, & Carey (2013) have urged norms researchers to target descriptive and injunctive norms separately to optimize their efficacy.

Although there are have been few studies examining injunctive norms feedback for college drinkers, interventions designed for health behaviors besides alcohol use have demonstrated that IN manipulations result in behavior change, and combined DN + IN manipulations are more effective than either alone (Mahler, Kulik, Butler, Gerrard & Gibbons, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007, Reid & Aiken, 2011).

Schultz et al (2007) were interested in decreasing energy usage among residents in San Marcos, CA. They separated their sample into high and low energy users and compared a descriptive norms only intervention to a combined descriptive and injunctive norms intervention. They also compared the short- and long-term effects of both interventions. The short- and long-

term results were parallel. In both conditions the descriptive norms only intervention produced *decreases* in energy usage for high-energy users (d = .55) and produced *increased* energy usage for low energy users (d = .52). This increased use is the so-called boomerang effect or destructive result of norms interventions. In the combined descriptive and injunctive norms intervention the high energy users had greater *decreases* in energy use compared to the descriptive only group (d = .63), and the low energy use group showed no change in energy usage. Indeed, the addition of the injunctive norms intervention increased the impact of descriptive norms on the high-energy users and nullified the boomerang effect for the low energy users for both the long- and short-term assessments. However, Shultz and colleagues (2007) did not provide IN feedback alone, so it is difficult to know the effect of IN feedback in the absence of DN feedback.

A similar outcome was demonstrated by Mahler et al. (2008) on increased sunscreen usage. Mahler and colleagues compared four groups (a) basic intervention only, (b) basic intervention plus descriptive norms intervention, (c) basic intervention plus injunctive norms only intervention, and (d) basic intervention plus combined descriptive and injunctive norms intervention. They found increased sunscreen usage for individuals receiving either single norms intervention relative to those receiving just the basic intervention (d = .30), and even greater sunscreen usage in the combined norms intervention compared to only receiving the basic intervention (d = .59). Further, they demonstrated that those in the combined norms condition had greater sunscreen usage than those in either single norms intervention (d = .38). The effect of IN feedback for sunscreen usage was replicated by Reid and Aiken (2011), who demonstrated that providing IN feedback that supports healthy sun-screen use promotes positive attitudes

toward healthy behaviors and leads to increased health protective behavior. It follows that developing a well-designed IN intervention for reducing college drinking, and testing the additive effect of providing students with both DN + IN intervention strategies, has the potential to increase the effectiveness of current DN interventions through supporting the drinking patterns of light drinkers and intensifying effects for heavy drinkers. Prince and Carey (2010) demonstrated that IN are malleable in college drinkers; however, at this point we can only extrapolate from other fields the potential effect of changing IN might have on excessive drinking behavior. We hypothesized that changes in IN would function with college drinkers similarly to the way they affect change in sunscreen and energy uses. Thus, we would expect students receiving both DN and IN interventions to report greater reductions in alcohol use and consequences than receiving DN alone. Increasing the effectiveness of a widespread college drinking intervention could reduce the risk of alcohol related problems for thousands of college students.

The development of an IN intervention that could be combined with existing DN interventions might provide colleges and universities with a more efficacious yet still brief corrective norms intervention that could reduce alcohol consumption to a greater extent than existing DN re-education alone. This combined protocol may help to reduce the magnitude and consequences of excessive drinking on college campuses.

Although norms-based interventions are widely used and are known to reduce alcohol consumption and alcohol-related consequences (Perkins, 2002), little research has examined the psychological processes underlying the observed changes. However, three studies have provided inconsistent evidence for actual-ideal discrepancy (Collins, Carey, & Sliwinski, 2002; McNally,

Palfai & Kahler, 2005; Murphy et al., 2010) and one study has provided support for negative affect (McNally, Palfai, & Kahler, 2005) as potential mechanisms underlying behavior change in response to DN interventions. The premise for this chain of effects following DN feedback is rooted in Cognitive Dissonance Theory (Festinger, 1954). These authors propose that once a student learns that he or she drinks more than the typical student and learns that the typical student drinks less than he or she thought it creates a discrepancy between the student's current drinking and his or her ideal drinking. This discrepancy results in negative self-focused affect, which motivates the student to reduce his or her drinking. The underlying assumption in this explanatory model is that students aspire to be typical drinkers, and that behaving in a way that violates the self-concept that "I am a typical drinker" is uncomfortable enough to motivate changes in behavior (Aronson, 1997).

Collins and colleagues (2002) compared a mailed personalized normative feedback form juxtaposing the participants' actual drinking to the national and campus averages to a mailed psychoeducational brochure about alcohol use on college campuses. The goal of this study was to increase actual-ideal discrepancy and test whether this discrepancy elicited decreases in alcohol use at two follow-ups (i.e., 6 weeks & 6 months). Results indicated greater increases in actual-ideal discrepancy and greater decreases in follow-up alcohol use for the personalized normative feedback group compared to the psychoeducational brochure group at 6-weeks, but these effect were not found at 6-months, suggesting that the effects may have worn off by the later follow-up assessment. Actual-ideal discrepancy did not mediate the relationship between group and alcohol use. It is possible that mediation was not found in this study due to their use of a commonly used, yet less powerful statistical procedure for testing for mediation (i.e., Baron

and Kenny approach) compared to current more rigorous methods (e.g., Mackinnon, Lockwood, Hoffman, West, & Sheets, 2002). Simultaneous multivariate approaches to testing mediation have been shown to be more powerful methods than traditional stepwise procedures (e.g., MacKinnon et al., 2002; Hayes & Scharkow, 2013).

Murphy et al. (2010) conducted a series of two studies comparing a face-to-face Motivational Interviewing-based intervention that included personalized DN feedback (i.e., BASICS) against (a) a computerized intervention without normative feedback (i.e., Alcohol 101+), and (b) against a computerized intervention that included personalized normative feedback (i.e., e-CHUG). Results from this series of studies indicated that the BASICS intervention elicited greater actual-ideal discrepancy compared to both Alcohol 101+ and e-chug, suggesting that delivering personalized normative feedback in a face-to-face format elicited greater actual-ideal discrepancy than delivering similar feedback in a computerized format. Formal tests of mediation could not be conducted by Murphy and colleagues (2010) because of a lack of difference in the outcome variables between groups, with all interventions eliciting positive outcomes. However, BASICS did produce pre-post effect size changes in actual-ideal discrepancy in the medium-to-large range ($\eta^2 = .11$). One potential reason that Murphy and colleagues (2010) did not find significant results was their choice of assessing outcomes using ANOVA, which is sensitive to small sample sizes (Study 1: N = 69; Study 2: N = 91). It is possible that with a larger sample size and a more sophisticated data analysis strategy the medium-to-large effects of BASICS on actual-ideal discrepancies would have resulted in detectable changes in drinking.

McNally, Palfai, and Kahler (2005) examined a causal chain from actual-ideal discrepancy and negative, self-focused affect as potential mechanisms of behavior change following descriptive norms feedback. This research demonstrated that those who received a brief motivational intervention had greater actual-ideal discrepancy and greater negative, self-focused affect compared to a control group, and that actual-ideal discrepancy and negative, self-focused affect were associated with drinking outcomes. However, they did not find support for either of these psychological processes as mediators of the intervention on alcohol use outcomes. It is possible that mediation was not found in this study due to the modest sample size (i.e., N = 73) and due to their use of the previously described Baron and Kenny approach to testing mediation.

In addition to potential statistical decisions and sample size limitations of the three studies reviewed, another possible explanation for the inconsistent support for actual-ideal discrepancy can be found in objective self-awareness (OSA) theory (Duval & Silvia, 2001; Duval & Wicklund, 1972). OSA asserts that individuals hold standards within themselves that define features that the self ought to have. Once attention is brought to the discrepancy between the self and the standards set by the self, negative affect arises. The result of this negative affect is a changing of behavior. Similarly, when attention is brought to the congruity between the self and the standards one sets for him or herself, positive affect arises. This positive affect rewards the congruity.

This theory has two key elements that are relevant to the discussion of behavior change resulting from personalized normative feedback. First, one explanation why a face-to-face intervention may be necessary to elicit actual-ideal discrepancy is that it forces the participant to

pay attention to the self, which is a prerequisite for the discrepancy to motivate behavior change (Phillips & Silvia, 2005), whereas computerized or mailed feedback may not make the self-attention as salient. A corollary to this point is that OSA focuses on standards the self "ought" to meet, which is more similar to Cialdini and colleagues' (1990) description of injunctive norms than descriptive norms. Second, just as interventions have only focused on half of the norms theory (i.e., descriptive norms), the small amount of research related to actual-ideal discrepancies and affect has only assessed negative, self-focused affect, ignoring the importance of positive affect. While it is important to elicit actual-ideal discrepancies that produce negative-self focused affect for heavy drinkers, it is also important to elicit positive affect through congruity for light drinkers. Finally, although this has not yet been tested, it is possible that there is a causal sequence between intervention condition, actual-ideal discrepancy, positive/negative affect, and resulting alcohol use that cannot be assessed using simple single mediator models.

Current study. The purpose of the current study was to develop a personalized, IN intervention targeting re-educating students about the true attitudes of other students at Syracuse University with regard to excessive drinking acceptability. We sought to build on previous studies by (a) collecting a larger sample size, (b) delivering the intervention material in person, in a Motivational Interviewing style, (c) controlling for boomerang effects seen in other fields, and (d) comparing the new IN intervention to DN only, to the Combined DN + IN intervention, and to a assessment only control group. Further, this study assessed changes in actual-ideal discrepancy and positive/negative affect in sequence following both types of normative feedback with heavy drinking college students. This study has the advantage of testing both aspects of the theory of normative conduct (i.e., descriptive and injunctive norms feedback on actual-ideal

discrepancy) and both aspects of objective self-awareness theory (i.e., role of discrepancy on positive and negative affect). This study assessed students at baseline, immediately post-intervention, and at 4-6 weeks post intervention. This longitudinal design allowed for tests of the sequential mediation described above resulting in changes in alcohol use.

Further, while all participants in the current study can be considered heavy drinkers given the inclusion criteria (i.e., at least one heavy drinking day in the past month), we differentiated between those who drank more than their gender matched average (heavy drinkers) and those who drank less than their gender matched average (light drinkers) because of the potential for a differential response to the descriptive norms feedback by drinker status (i.e., light drinkers may increase drinking, while heavy drinkers may reduce drinking) suggested by prior research in related fields.

One study has examined the boomerang effect in college drinkers (Prince et al., in press). Prince and colleagues defined drinker status (i.e., light or heavy) by whether a student's reported drinking at baseline was greater than (heavy drinker) or less than (light drinker) the number he or she was presented in the descriptive norms section of the personalized feedback as the typical average number of drinks per week for the gender matched student on campus. In the current study, we used this definition for students in all four conditions. Students in the IN condition and students in the control condition, who did not see any actual drinking patterns, were dichotomized using the same criteria – as if they had learned the true drinking levels of their gender matched peers.

Prince et al (in press) examined the evidence for a boomerang effect for college drinkers who drank less than the norm across multiple samples following either a multi-component brief

motivational interview or following web-based personalized descriptive norms. The authors did not find evidence to support a boomerang effect; however, they note that the samples they examined had small sample sizes, and they only assessed one dependent variable (i.e., typical drinks per week) that was common across samples. While results presented by Prince et al (in press) provide preliminary evidence that investigators may not need to control for boomerang effects in studies using a multi-component motivational interviewing delivered DN intervention or a single component personalized web-based DN feedback, it is unclear how students may respond to a personalized, face-to-face, single-component DN, IN, or DN+IN intervention as is presented here, or to IN feedback in general. Thus, the current study was designed to detect boomerang effects that may have resulted for light drinkers (i.e., students who drink below the norm presented to them in the intervention), given that our intervention is unique and boomerang effects for college drinkers are just beginning to be explored.

The hypothesized effects of each intervention condition are presented in Table 1 separated by heavy and light drinkers using the criteria defined earlier. In the current study, we expected the typical pattern of normative feedback for heavy drinkers in the DN condition to be that students would believe that their peers consumed more than they actually did and would believe that they personally consumed less than their peers, whereas this group would actually drink more than their peers. An example of this scenario would be: perception of others' drinking 20 drinks per week, self-reported drinking 15 drinks per week, and actual consumption by peers 9 drinks per week (Perkins, Haines, & Rice, 2005; Carey, 2010). Thus, receiving the information that one is actually a heavy drinker and not a typical drinker was expected to create an actual-ideal discrepancy (i.e., actual = heavy, ideal = typical) and in turn create negative, self-focused

affect. The desire to eliminate this affect was expected to motivate behavior change (Higgins, Rhodewalt, & Zanna, 1979), in this case facilitating *decreases* in drinking. In contrast, we expected that the typical pattern of normative feedback for light drinkers in the DN condition would be that students would believe that their peers consumed less than they actually did and would believe that they personally consumed a similar amount as their peers, whereas this group would actually drink less than their peers. Thus, receiving the information that one is actually a light drinker and not a typical drinker would be expected to create an actual-ideal discrepancy (i.e., actual = light, ideal = typical) and in turn create negative, self-focused-affect eliciting *increases* in drinking (Cialdini & Trost, 1998).

For comparison, in the current study we expected the typical pattern for the IN condition to be that heavy drinking students would believe that their peers were more accepting of excessive drinking than they actually were and that they held more conservative attitudes than their peers. Based on survey data heavy drinking students were expected to hold less conservative attitudes about excessive drinking than their peers. An example of this scenario would be: perception of others as finding blackouts to be highly acceptable, self-reporting blacking out as unacceptable, and actual peer attitude that blackouts are highly unacceptable (Schroeder & Prentice, 1998; Carey, 2010). Thus, we expected that receiving the information that one's own attitudes are less conservative than the attitudes of others would elicit an increase in actual-ideal discrepancy (i.e., actual = Others do not approve of my drinking, ideal = others approve of my drinking) and would create negative, self-focused affect facilitating *decreases* in drinking. In contrast, we expected light drinkers in the IN condition to believe that their peers were more accepting of excessive drinking than they actually were and that they would hold

more conservative attitudes than their peers. Based on survey data light drinking students were expected to hold equally conservative attitudes about excessive drinking as their peers. Thus, receiving the information that one's privately held attitudes about excessive drinking were actually inline with the privately held attitudes of others would be expected to affirm their current drinking (i.e., others approve of my current light drinking pattern), lessen their actual-ideal discrepancy, create positive, self-focused affect, and encourage them to *maintain their current drinking* (Shultz et al., 2007).

In the combined DN + IN condition heavy drinkers received the feedback that they drank more than the typical student (DN) and that other students did not approve of excessive drinking (IN). This was expected to create more actual-ideal discrepancy and more negative-self-focused affect than either norms condition alone facilitating *greater decreases* in drinking. In contrast, light drinkers received the feedback that they drank less than the typical student (DN) and that other students did not approve of excessive drinking (IN). This was expected to affirm their current drinking (lessening their actual-ideal discrepancy), create positive, self-focused affect, and encourage them to *maintain their current drinking*. Importantly, for light drinkers the combined DN + IN intervention was expected to attenuate any potential boomerang effects (Shultz et al., 2007). Overall, the combined intervention was expected to demonstrate an increased effect of decreased drinking for heavy drinkers and eliminate any increased drinking among light drinkers creating a more powerful intervention.

This protocol is an improvement over existing intervention techniques because it addresses both primary sources of social norms information, namely perceptions about what other people do and what others approve (Cialdini, Reno, & Kallgren, 1990). By adding the IN

intervention to the current DN based intervention protocol, students will not only gain more accurate knowledge about how much their peers are drinking, but also will become better informed about beliefs held by their peers with regard to excessive drinking behaviors. Because both sets of actual norms are likely to be more conservative than previously held perceptions, this dual-focused norms based intervention had the potential to elicit greater decreases in alcohol consumption than the current standard approach of presenting corrective feedback on DN alone. Further, the addition of an injunctive norms intervention may reduce the risk of an increase in alcohol use among lighter drinkers.

One key to understanding the effects of an intervention lies in selecting appropriate data analysis techniques. This study examined the sequential mediation hypothesis using a multi-group serial mediation path analysis that allowed for specific tests of direct and indirect pathways, as well as comparisons of light and heavy drinkers on key paths in the sequence (Hayes, 2012). In addition, a well-known methodological obstacle when studying alcohol use is that indices of consumption (e.g., drinks per week [DPW], blood alcohol content [BAC]) are often positively skewed. However, traditional data analysis techniques like linear regression and ANOVA assume that these variables are normally distributed. Alcohol use variables are typically represented by a count (e.g., number of DPW) or as a continuous interval variable (e.g., typical BAC). Two classes of non-normal distributions at times better represent the positive skew found among alcohol consumption indices in college samples: the Poisson and related negative binomial distributions for count variables, and the Gamma distribution for continuous variables (Neal & Simons, 2007). The proposed study examined the distribution of the data collected and selected the most appropriate of the following three analytic strategies, (a) treat the observed

variable as normal, (b) transform the variable and then treat it as normal, or (c) treat the variable as non-normal and use statistical methods that allow for the true distribution (e.g., negative binomial) in the analysis.

Innovation

This project contains three innovations. First, the proposed study developed and evaluated a brief, personalized, one-on-one IN manipulation delivered in a motivational interviewing style that can be added to existing DN based interventions. There are no published studies of efficacy of one-on-one individualized IN manipulation for the purpose of reducing risky drinking. Second, this study evaluated separate and combined effects of IN and DN feedback. No study to date has examined the combined effect of a face-to-face intervention manipulating both IN and DN on college drinking delivered in a Motivational Interviewing style. The third innovation in the proposed study was the assessment of psychological processes underlying behavior change that results from receiving both types of normative feedback. Although a few studies have examined mechanisms of change for DN interventions (e.g., Collins, Carey, and Sliwinski, 2002; McNally et al., 2005; Murphy et al., 2010), no research has examined mechanisms of change for IN interventions for college drinking. Insight into psychological processes underlying behavior change could provide a more thorough description of how and why norms interventions work on an individual level. Further, understanding specific psychological processes that give rise to behavior change is critical to the evaluation and replication of interventions as well as the development of testable theories (Michie, Johnston, Francis, Hardeman, & Eccles, 2008).

Specific Aim #1 was to determine if an IN feedback component enhances the efficacy of a DN feedback intervention. Hypotheses related to this aim were: (a) all three intervention conditions would reduce consumption from baseline to follow-up more than the control group, and (b) that the combined DN + IN intervention would produce greater decreases in drinking than either the standard DN-only intervention or the IN-only intervention.

Specific Aim #2 of the current study examined psychological processes that could serve as mechanisms of behavior change in response to normative feedback. We hypothesized that heavy and light drinkers would respond differently to each intervention condition (see Table 1). We hypothesized that (a) heavy drinkers in either the DN, IN, or DN + IN condition would experience greater actual-ideal discrepancy and greater negative, self-focused affect compared to the control condition resulting in decreases in drinking outcomes with the combined condition facilitating greater decreases than either single norms condition, (b) light drinkers in the DN condition would experience greater actual-ideal discrepancy and greater negative, self-focused affect compared to the other three conditions resulting in decreases in drinking outcomes, (c) light drinkers in the IN or DN + IN condition would experience less actual-ideal discrepancy and greater positive, self-focused affect compared to the other two groups resulting in maintaining their current drinking. Together, we hypothesized an indirect effect from intervention condition to follow-up alcohol use outcomes through actual-ideal discrepancy and positive/negative affect that differed by drinker status.

Specific Aim #3 was to determine if the type of normative feedback (i.e., descriptive or injunctive) facilitated changes in matched norms perceptions. Given the limited number of intervention studies including injunctive norms feedback, we relied on studies suggesting that

descriptive and injunctive norms are unique constructs (e.g., Lee et al., 2007; Merrill et al., 2013), and hypothesized that descriptive norms feedback would facilitate changes in perceived descriptive norms and that injunctive norms feedback would facilitate changes in perceived injunctive norms. Moreover, we hypothesized that the combined intervention would facilitate changes in both perceived descriptive and injunctive norms.

Method

Design. The proposed study was designed to reduce alcohol consumption among college students through the use of brief social norms feedback interventions. This constructive study used a randomized factorial 2 (IN manipulation: yes or no) by 2 (DN manipulation: yes or no) design yielding four independent intervention conditions: a combined DN + IN manipulation, DN only, IN only, and an assessment-only control. The initial baseline assessment to gather background information, the intervention, and a post-intervention assessment to assess psychological process variables occurred on the same day. A web-based follow-up assessment was conducted 4- to 6-weeks later. Similar follow-up intervals have been sensitive in detecting the effects of brief alcohol interventions (Carey, Scott-Sheldon, Carey, & DeMartini, 2007). Primary outcome variables of average typical and heavy drinks per week (tDPW; hDPW), estimated typical and peak blood alcohol concentration (tBAC; pBAC), maximum quantity of alcohol consumed in one day (Max), and number of alcohol related consequences (ARC) were collected for the past 30-day interval. Table 2 presents information on the assessment properties of each alcohol use and consequences variable. In summary, assessments were conducted to gather information about a typical week of drinking and a heavy week of drinking, and to assess for level of intoxication on a typical night and on the heaviest night in the past month. In

addition, we assessed for the maximum number of drinks in a single night to gather information about consumption level regardless of gender, weight, and rate of consumption. Finally, we assessed for alcohol related consequences in addition to the five alcohol consumption variables because alcohol related consequences are an indicator of functional impairment due to alcohol use. Secondary outcome measures were participants' ratings of DN and IN and psychological process variables (i.e., actual-ideal discrepancy; negative and positive self-affect) that were used to assess intervention specificity to change matched norms differentially, and to assess proximal effects of the intervention and to provided a preliminary test of targeted mechanisms of behavior change, respectively. The control group participated in assessments to control for research and assessment reactivity as well as history/maturation effects.

Participants. Participants were college students recruited from Introductory Psychology classes who were screened for current levels of alcohol use. Students were potentially eligible to participate in the study if they report at least one heavy drinking day (i.e., 5+ drinks for men/4+ drinks for women) in the past month (Wechsler et al., 1994) and were 18 years of age or older. All provided informed consent prior to their participation and completed the baseline assessment in an on-campus lab. After being randomized into one of the study conditions, participants received an intervention and were asked to complete a post-intervention assessment in a private interview room. Six weeks later participants either returned to the lab to fill out a follow-up survey or completed an online follow-up assessment. All were debriefed at the end of the study either in person or by email. Participants were given course credit to complete the baseline assessment, the face-to-face intervention, and the post-intervention assessment, and they

received a modest economic incentive (e.g., $15) for completing the 6-week online follow-up assessment.

Measures. All measures are presented in Appendix A. The baseline assessment used paper and pencil forms and was completed in the research lab. The post-intervention assessment was completed in-person in the lab. The follow-up survey was completed either in person in the lab or online at remote locations. Baseline included measures of the primary and secondary dependent variables as well as the data used for the personalized feedback in the intervention conditions.

Alcohol use. Drinks per week (i.e., tDPW and hDPW) was assessed in the proposed study using a modified version of the Daily Drinking Questionnaire (DDQ: Collins, Parks, & Marlatt, 1985). Students reported the standard drinks consumed on each day in a typical week in the past 30 days. The DDQ was supplemented with questions regarding the maximum alcohol consumption in a single day in the last month as well as typical drinks per drinking day and hours spent drinking to allow calculation of estimated typical and peak BAC (Carey, Henson, Carey, & Maisto, 2009).

Descriptive and Injunctive Norms. DN and IN for college alcohol use have been assessed in a number of ways and with regard to a variety of referent groups. Neighbors and colleagues (2008) assessed a variety of referent groups for both descriptive and injunctive norms, and recommended typical same sex student as an appropriate referent group for both types of normative feedback. However, they noted that injunctive norms may be more complex than descriptive norms, with fluctuations seen in the relationship between injunctive norms and drinking varying with the proximity of the referent group. Moreover, Larimer and colleagues

(2009) recommended that at least one level of specificity to the participant (e.g., typical students *at your school*) be used for normative feedback interventions. Following these recommendations, the current project used "Same Sex Students at Syracuse University" as the referent group, providing students with two levels of specificity, which has been shown to enhance personalization and relevance (Larimer et al., 2009). This referent group has two primary advantages: it controls for gender differences in alcohol consumption (Larimer et al., 2009), and university-specific data are available at this level of specificity to compare to students' perceptions about the consumption of this group in the interventions. Regarding gender specific referent groups, Lewis and Neighbors (2007) demonstrated that gender-specific referents are particularly important for women, whereas there was not a difference in effect between gender-specific and gender-neutral referent groups for men. Perceived DN (for the "typical same-sex student at SU") were assessed using a 7-day grid to assess perceptions of peer alcohol use (Baer, 1994).

The IN assessment consisted an expanded version of the Baer et al. (1991) 4-item IN questionnaire to ten items with the following stem "How would students at SU respond if they knew…"; such as "You drank alcohol every weekend," and "You drank alcohol enough to pass out". Cronbach's alpha for this 10-item measure is .82 (Carey, Henson, Carey, & Maisto, 2010).

The five of the primary dependent variables represent alcohol consumption were tDPW, hDPW, tBAC, pBAC, and Max and one representing ARC. These outcome variables capture multiple dimensions of the alcohol use in the sample, and are related to normative perceptions (Agrawal, eta al., 2009; Carey, Henson, Carey, & Maisto, 2010). Secondary dependent variables included follow-up ratings of psychological process variables, as well as DN and IN collected at

post-intervention and at the 4- to 6-week follow-up. These variables provided information about the magnitude and direction of specific and nonspecific intervention effects on normative perceptions (i.e., manipulation check) and allowed us to test mediation hypotheses that changes in drinking result from changes in psychological process variables.

Psychological Process Variables. Psychological process variables were assessed at baseline, post-intervention, and at the follow-up assessment using the following measures. Actual-ideal discrepancy was assessed using a single item developed by McNally et al. (2005). Students were asked to rate their current drinking patterns on a scale from 0 (I am now at my ideal) to 10 (I am extremely far from my ideal). Both negative and positive self-affect were assessed using the Positive and Negative Affect Scale (PANAS; Watson et al., 1988). Completion of the PANAS requires participants to rate their agreement with 60 descriptors, including 10 descriptors relating to positive affect (i.e., active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, and strong) and 10 descriptors relating to negative affect (i.e., afraid, scared, nervous, jittery, irritable, hostile, guilty, ashamed, upset, and distressed) on a 1 to 5 Likert scale. Positive and negative affect scores were created by summing the 10 items in each subscale. The PANAS has reasonable reliability ($\alpha = .85$), as well as convergent and discriminant validity (Schmulke et al., 2002).

A priori power and sample size. An a priori power analysis was conducted using G*Power Version 3 (Faul, Erdfelder, Lang, & Buchner, 2007) to determine an appropriate sample size for the primary study hypotheses. A study comparing the efficacy of personalized DN feedback delivered with or without motivational interviewing reported within-group decreases in DPW of d = .42 - .48 (Walters, Vader, Harris, Field, & Jouriles, 2009). Thus, we

expected a small to moderate effect when comparing DN-only to no intervention. In a dismantling study examining personalized normative feedback (DN feedback only) delivered with or without a motivational interviewing style to reduce college student drinking (Murphy et al., 2004), between-groups effect sizes ranged from d = .37 (6-month difference in typical BAC between motivational interviewing style with personalized feedback vs. assessment only) to d = .75 (DPW at 3-months). Thus, we utilized a fairly conservative estimate of d = .40 for the DN intervention effect vs. control at 4-6 week follow-up (considered a small to medium effect; Cohen, 1988), which equates to f = .32 for ANOVA. An a priori sample size calculation for a fixed-effects one-way ANOVA (presuming power of .80) with four levels of the independent variable requires a total sample size of 112. However, because the primary analyses can and were tested within the context of a larger path model, we conducted an additional power analysis to establish the minimum sample size required to test both primary and secondary hypotheses simultaneously.

To test the associations among, alcohol use and consequences, intervention condition, and psychological process variables (i.e., actual-ideal discrepancy, positive affect, and negative affect) we used a multi-group serial mediation path analysis (see Figure 1). Multi-group serial mediation path analysis is a form of moderated mediation where specific, a priori mediation pathways are tested for differences between predefined groups within a single model. Power analysis for this model was conducted using Preacher and Coffman's *quantpsy* software for calculating the minimum sample size needed for comparing nested models for RMSEA (see Preacher & Coffman, 2006; MacCallum, Browne, & Sugawara, 1996). Based on MacCallum et al. (1996) criterion for poor, moderate, and good fit, power was tested for the minimum sample

size need to detect an improvement over a poor fitting model (RMSEA = 0 vs. .1), a moderate fitting model (RMSEA = 0 vs. .08), and a good fitting model (RMSEA = 0 vs. .06). These tests suggested, N = 119, N = 184, N = 327, respectively for the multi-group serial mediation path model presented in Figure 1. Previous research by Bentler and Chou (1987), suggests a ratio of 5 to 1 participants to degrees of freedom. A simulation of the path model presented in Figure 1 revealed 26 degrees of freedom, which would suggest a necessary sample size of as few as 90 participants would be adequate to test this model. Based on the information above and practical considerations, we planned to recruit 200 participants, to allow for difficulties in recruitment and attrition, and still retain an adequate sample at the 4-6 week follow-up. This sample size would allow for analysis of all pairwise comparisons of intervention conditions as well as a test of fit for the multi-group serial mediation path analysis.

Procedure. The delivery mechanism for social norms interventions is related to efficacy. Systematic testing of intervention delivery strategies suggests that the most powerful intervention is delivered face-to-face, with written and personalized normative feedback (see Appendix B for an example), using a motivational interviewing style (Murphy et al., 2004; Walters, Vader, Harris, Field, & Jouriles, 2009; White, 2006). Thus, both the DN and the IN manipulations were delivered face-to-face, used written personalized normative feedback, and were delivered using a motivational interviewing style. Each of the individual interventions took approximately 15 minutes to complete, and the combined intervention took approximately 30 minutes to complete. Interventionists were three Syracuse University Clinical Psychology PhD students who had completed training in Motivational Interviewing, including directed readings, MI training DVDs, and supervised role-plays, as well as, training covering the intervention

manual for the proposed. Interventionists were supervised by Dr. Stephen Maisto, a licensed clinical psychologist, and met with Mark Prince, the PI, on a weekly basis to discuss any issues that arise. Mr. Prince has extensive training in alcohol-related interventions for youth and young adults using Motivational Interviewing, as well as two-years of experience administering brief motivational interventions to college student drinkers. All interventions were audio recorded. Dr. Stephen Maisto supervised Mr. Prince. Mr. Prince and Dr. Maisto met weekly to review audio recordings of sessions and discussed any difficulties or clinical issues that arose. Interventions were manualized (see Appendix C). Manuals were modeled after previously tested face-to-face motivational interviewing based norms interventions (e.g., BASICS; SURE). Following completion of the interventions, Dr. Maisto and Mr. Prince checked a random subset (approximately 25%) of interventions for treatment fidelity and internal validity. Participants were randomly assigned to one of the three interventionists to complete the intervention.

Both the DN and IN interventions followed the same general format but differed in the specific content of the personalized feedback and normative comparisons. The complete manual for all three intervention conditions is presented in Appendix C. First, the common structure will be described, followed by the specific content. In the context of the baseline assessment, students reported their own use and attitudes about excessive drinking behaviors as well as their perceptions about the typical SU student's use and attitudes about excessive drinking behaviors. These data were used to create a personalized normative feedback form (PNF), which the interventionist used to guide the intervention discussion. As noted earlier, previous studies have shown that students tend to overestimate both their peers' actual alcohol use as well as their peers' acceptability of excessive drinking. The discussion was designed to create discrepancy

through identifying self-other differences (SOD) in two ways. The interventionist used survey data available at Syracuse University (SU) to create normative data for the typical same sex SU student and then compared the student's personal use and personal attitudes to the actual use and actual attitudes of typical SU students (personal norms vs. actual norms). In addition, the interventionist used the survey data to compare participants' perceptions of the typical same sex SU student's use/attitudes to the actual behavior and attitudes of the typical same sex SU student (perceived norms vs. actual norms). Students were given an opportunity to discuss their reactions to the information presented to them and were encouraged to process the information with the interventionist. The interventionist used a motivational interviewing style to guide students through personalized feedback and normative comparisons. The goal of the DN intervention was to revise behavioral norms downward, challenging students' exaggerated perceptions about their peers' drinking behaviors. This was achieved by presenting them with information that most students drink a smaller amount of alcohol. Similarly, the goal of the IN intervention was to revise perceptions of peer approval downward by challenging perceptions that peers find excessive drinking acceptable. This was achieved by presenting students with information that most of their peers find excessive drinking unacceptable.

With regard to specific content, the DN intervention involved a review of the participant's reported current personal alcohol use (i.e., DPW and frequency of heavy drinking episodes) juxtaposed with his or her rank (percentage) among same-sex SU students (e.g., You told me you drank 25 drinks per week, that means that you drank more than 85% of all male students at SU). Next the student's perception of how much the typical SU student is drinking was juxtaposed with the actual number of drinks per week that were consumed by the typical SU

student (e.g., “You told us that you thought that the typical male student drank 25 drinks per week, in reality the typical male SU student actually only drinks 9 drinks per week”). Following the personalized DN feedback, the student was prompted to consider the potential etiology of his or her exaggerated perceptions (or their ability to accurately judge) about peer drinking behaviors, as well as the implications of overestimation.

The IN manipulation began by comparing the student’s personal attitudes regarding excessive drinking behaviors juxtaposed with the actual attitudes of the typical SU student about the acceptability of excessive drinking behaviors (e.g., “You personally rated passing out as a result of drinking alcohol as highly unacceptable, 95% of students at SU agree with you that passing out as a result of drinking alcohol is highly unacceptable”). Next, the exaggerated perceptions about others’ permissiveness of excessive drinking behaviors were juxtaposed with actual reports about the acceptability of excessive drinking behaviors (e.g., “You thought that most students find blacking out as a result of drinking alcohol to be highly acceptable, in reality, 90% of male students at SU rated blacking out as a result of drinking alcohol to be highly unacceptable”). Items with the greatest discrepancy between perceived attitudes and actual attitudes were selected by interventionists for inclusion in the personalized IN feedback. This ensured maximum personalization and discrepancy generation. Following the personalized IN feedback, the students were prompted to consider the potential etiology of their exaggerated perceptions about (or their ability to accurately judge) peer attitudes about excessive drinking, as well as the possible implications of overestimation.

The combined intervention included all of the elements of both the DN and IN interventions described earlier.

Following the intervention, students participated in a post-intervention assessment to assess potential psychological processes that were hypothesized to be mechanisms of behavior change. The post-intervention assessment included self-report measures of descriptive norms, injunctive norms, negative and positive affect, and actual-ideal discrepancy. The post-intervention assessment was designed to provide insight into students' reactions to participating in the intervention and allow for a manipulation check of the intervention condition through assessment of changes in condition matched norms (e.g., descriptive norms changed by DN intervention).

Overview of the Analyses

Preliminary analyses. Study groups were compared across demographic and study variables using either one-way ANOVAs for continuous variables (e.g., age) or chi-squared analyses for categorical variables (e.g., ethnicity). All dependent variables were tested for normality. Any variables that are non-normal were either transformed or analyzed using analyses that assume their true distribution (e.g., Poisson, Negative Binomial, or Gamma distributions) in all subsequent analyses.

Hypothesis testing. *Hypothesis 1.* All three intervention conditions would reduce alcohol consumption at follow-up more than the control group. *Hypothesis 2.* The combined DN + IN intervention would produce greater decreases in drinking than either the standard DN intervention alone or the new IN intervention alone. *Hypothesis 3.* Heavy and light drinkers would respond differently to interventions (see Table 1). Intervention conditions were expected to differentially change actual-ideal discrepancy and Positive/Negative affect that would in turn

facilitate changes in alcohol. *Hypothesis 4.* DN and IN interventions will facilitate changes in matched norms, and the combined condition will facilitate changes in both DN and IN.

The first three hypotheses were tested using the multi-group serial mediation path model presented in Figure 1 following MacKinnon and colleagues' suggestions (MacKinnon et al., 2002). Simultaneously testing hypotheses increases statistical power and reduces type I error (Hayes, 2009). Testing direct and indirect effects for mediation hypotheses has been shown to be superior to traditional stepwise approaches (Hayes, 2009). In addition, these models are flexible to modifications and could easily be changed to include covariates related to the dependent variables.

Hypotheses 1 and 2 were tested with path ci (i = 1-3), the direct effect between intervention condition and follow-up alcohol use. Because intervention condition is a four level categorical variable it is actually composed of three Helmert contrast coded variables (e.g., variable 1 coded: 1, -1/3, -1/3, -1/3; variable 2 coded: 0, 1, -1/2, -1/2; variable 3 coded: 0, 0, 1, -1) rather than one variable. Helmert contrasts are designed to compare the mean of each level of the categorical independent variable to the mean of each subsequent level, which is appropriate for testing differences in treatment conditions. Each set of contrasts allows for 3 pairwise comparisons, so contrasts must be recoded three times to achieve all pairwise comparisons. Depending on the contrast coding of the intervention condition variable comparisons of follow-up alcohol use was made between all of the four treatment conditions.

The hypothesized chain of effects from intervention condition to follow-up alcohol use through actual-ideal discrepancy and positive and negative affect was tested using the rest of the paths in the model. First, intervention condition was expected to elicit actual-ideal discrepancy,

which was designed to affect changes in drinking at follow up. This hypothesis was tested by assessing paths a1i (i = 1-3), ci (i = 1-3), and b1, the direct effect of intervention condition on actual-ideal discrepancy, the direct effect of intervention condition on follow-up alcohol use, and the direct effect of actual-ideal discrepancy on follow-up alcohol use, respectively, as well as the indirect effect from intervention condition to follow-up alcohol use and ARC through actual-ideal discrepancy (i.e., path a1i*b1, i = 1-3). Next, the serial mediation hypothesis tested the indirect effect from intervention condition to follow-up alcohol use through actual-ideal discrepancy and positive and negative affect. To test this hypotheses, the direct effects of actual-ideal discrepancy on positive and negative affect (i.e., paths a2 and a3), as well as the direct effects of positive and negative affect on follow-up alcohol use (i.e., paths b2 and b3), were estimated along with paths a1i (i = 1-3) and ci (i = 1-3) described above. The specific indirect effect from intervention condition to follow-up alcohol use through actual-ideal discrepancy and positive affect was tested with a1i*a2*b2 (i = 1-3). Similarly, the specific indirect effect from intervention condition to follow-up alcohol use through actual-ideal discrepancy and negative affect was tested with a1i*a3*b3 (i = 1-3). Finally, the dotted lines in Figure 1 were expected to differ by drinker status (i.e., baseline drinking above or below the number of drinks presented in the DN intervention). Using a multi-group analysis of this serial mediation model allowed for comparisons of these paths between groups.

Hypothesis four was tested in two ways, (a) we calculated change scores from BL to Post and from BL to FU, and then ran a series of one-sample t-tests comparing the change to zero within each condition for each of the norms assessments (i.e., DN grid, IN approval ratings), and (b) we ran two mixed models ANOVAs examining changes over time (i.e., BL to Post to FU)

separately for each norms measure and then compared changes in norms across the four treatment conditions by including an interaction term in the models.

Results

Descriptive Statistics. Descriptive statistics and demographics for the final sample are presented in Table 3. A total of 155 students completed the baseline survey. One participant dropped out of the study after starting but before finishing the baseline survey. Twenty-one participants (14%) completed the baseline survey, intervention, and post-survey, but did not complete the follow-up survey. There was no difference between those who completed the survey and those who did not complete the survey on any demographic variables, baseline alcohol use and consequences variables or process variables (i.e., AID, PA, and NA) ($ps > .05$).

Further, 74% of the sample completed the study on time (i.e., within 4-6 weeks following the baseline assessment), and 26% completed it late (range 1-137 days late). Some evidence suggests that brief intervention effects may wear off by 6 months post intervention (e.g., Collins, et al., 2002), and so we assessed for difference between those who completed the follow-up survey on time vs. late. There were no difference between those who completed the survey on time and those who completed the survey late on any demographic variables, baseline alcohol use and consequences variables or process variables (i.e., AID, PA, and NA) ($ps > .05$). Even though there were no differences found between those who completed the survey on time vs. late, we chose to control for time-to-follow-up in our path analyses.

Participants. The final sample consisted of 133 students 50% of whom were male. Post-hoc power analysis of the multi-group serial mediation path model (final model 26 df) using the online utility on quantpsy.org revealed an observed power of .95 (see Figure 2). The majority

identified as non-Hispanic, white, and living on campus. At baseline, in the past month on a typical week students in the study reported drinking 12.82 (SD = 9.35) drinks and on a heavy week in the past month students reported drinking 18.17 (SD = 13.95) drinks. In addition, at baseline, students in the study reported experiencing on average 6.52 (SD = 3.95) alcohol related consequences in the month prior to participation. There were 32 light drinkers and 122 heavy drinkers, defined by their baseline drinking level relative to the norm presented in the DN condition, evenly distributed among conditions, $\chi^2(3) = 2.34$, $p = .51$.

Tables 4a and 4b present the pattern of baseline survey responses corresponding to the expected pattern of findings regarding perception of others attitudes, personal use and personal attitudes, and actual use and attitudes of other students separated by drinker status and norms measure for DN and IN measures respectively. In Table 4a assessing patterns for descriptive norms, 100% of light drinkers actual drinking was less than their perception of other students' drinking. This was not by definition, because participants were categorized as light drinkers if their personal drinking was less than the number of drinks per week presented in the DN feedback, which was derived from data collected in a prior study. In addition, no light drinkers learned that they drank more than the typical student. Among heavy drinkers, 74% fit the pattern of expected findings, i.e., they believed other students drank more alcohol than themselves, and learned that they personally drink more than the typical student. In Table 4b assessing patterns for injunctive norms, 63% of light drinkers believed that their peers were more approving of excessive drinking than themselves, and learned that they in fact hold more permissive attitudes than the typical SU student. Among heavy drinkers, 61% of students fit that same pattern with regard to injunctive norms. Similar to the DN feedback, the actual attitudes of other students

were derived from a separate study assessing SU student's acceptability of excessive drinking. We expected students to learn that they held similarly conservative attitudes to typical SU students, when in fact, in this sample, participants held more permissive attitudes toward excessive drinking behaviors.

Distributional Assumptions. Distributional assumptions for all dependent variables were tested in two ways, (a) using one-sample Kolmogorov-Smirnov (K-S) tests comparing the true distribution to normal and then comparing a square root transformed distribution to normal, and (b) running a series of regression models assuming the dependent variable to be normal with the observed distribution, assuming the dependent variable to be normal with a square root transformed version of the observed distribution, and assuming the distribution was either gamma for continuous variables or negative binomial for count variables and using the Bayesian Information Criterion (BIC) as a comparative fit index. Results of the K-S test revealed that all dependent variables were not statistically different from normal ($ps > .05$) with the exception of ARC ($z = 1.57$, $p = .01$) and tBAC ($z = 2.50$, $p < .01$). After the square root transformations all variables were not statistically different from normal ($ps > .05$), with the exception of Max drinks ($z = 1.62$, $p = .01$). Results from the model fit procedure using the regression models are presented in Table 5. In all cases the models using the square root transformed distributions had the best comparative model fit, with BIC values closest to zero. Thus, in all subsequent analyses square root transformed variables were used as the dependent variables. Table 6 presents the intercorrelations among alcohol use and consequences variables at baseline and follow-up. The correlations ranged from non-significant to highly significant and the magnitude of the correlations ranged from small to large. All correlations were positive, as would be expected. A

rationale for the inclusion of multiple indicators of alcohol use that are highly correlated, yet substantively distinct is presented above and in Table 2.

Randomization check. There were no differences among the intervention conditions on any of the alcohol use or consequences variables at baseline, any of the demographic variables (i.e., gender, ethnicity, residence type), any of the process variables (i.e., actual-ideal discrepancy, negative affect, positive affect), or either of the norms measures (i.e., descriptive norms at baseline, injunctive norms at baseline), ps > .05 for t-tests, one-way ANOVAs or chi-square tests, as appropriate.

Fidelity check. A checklist of the intervention material was created (see Appendix D), to assess whether interventionists covered the appropriate intervention material in each intervention. Mark Prince reviewed 25% of the completed intervention audio recordings (i.e., 33 in total) that were randomly selected using a random number generator. There were no instances of interventionists covering information in one intervention that belonged in another intervention (i.e., no evidence of cross-contamination), and the rates of adherence to the protocol neared 100%. In general, the fidelity checklist was composed of 11 points specific to the DN intervention, and 11 points specific to the IN intervention. The Combined conditions needed to include all 22 points. In the Combined condition all audio recordings checked reached 100% fidelity on all 22 items. In the DN only condition, 10/11 items were covered 100% of the time, and one item (i.e., “Queried and discussed, “what went into your estimate?”) was not covered in two interventions resulting in a 92% adherence rate for that item. In the IN only condition, 9/11 items were covered 100% of the time, and two items were covered less than 100% of the time. Specifically, “Discussion of student’s own acceptability compared to perceived norm” was not

covered on 2 occasions, resulting in a 90% adherence rate for that item, and "Discussion of student's actual compared to perceived norm" was not covered in 1 intervention, resulting in a 95% adherence rate for that item". Averaged together, there was a treatment fidelity rate (i.e., average percentage covered across the 22 items) of 98.95%.

Intervention satisfaction. Students were asked three questions regarding their satisfaction with the intervention (i.e., how satisfied, how likely to share information, how interesting). The majority of students reported being "highly satisfied" with the content of the intervention discussion (62%), with a higher percentage endorsing "highly satisfied" in the IN condition than in other conditions, IN: 74%; Combined: 66%; DN: 47%, χ^2 (12) = 25.64, $p < .01$. The majority of students reported that they were either "moderately or very likely" to share the intervention material with their peers (66%), with the highest likelihood of sharing being reported by the Combined group, IN: 69%; Combined: 71%, DN: 58%, χ^2 (18) = 44.31, $p < .01$. The most common response for the question regarding how interesting the intervention content was perceived was "Very Interesting" (49%), with the highest percentage of students reporting "Very Interesting" in the IN condition, IN: 60%, Combined: 46%, DN: 42%, χ^2 (12) = 58.24, $p < .01$.

Manipulation check. Students were asked five yes/no questions testing their ability to recognize information that either was or was not presented to them in the intervention. The first question addressed whether they were provided with information regarding how much other students drink. The correct response was "yes" for DN and Combined and "no" for IN. Overall 89% of students responded "yes", with 84% in the IN condition incorrectly responding with "yes", 97% of students in the Combined condition correctly responding with "yes", and 94% of

students in the DN condition correctly responding with “yes”. The next question asked whether students were given information about how to reduce their BAC. The correct answer was “no” for all conditions. Nearly, all students answered “no” for this item, Overall: 94%, IN: 100%, Combined: 94%, DN: 97%. The third question was about whether they were given information about what organs can be damaged by alcohol use. The correct answer was “no” for all groups. Most students correctly with “no”, however a sizeable number of students in the Combined condition responded incorrectly with “yes”, percent responding “no”: Overall: 86%, IN: 95%, Combined: 72%, DN: 94%. The fourth question asked whether students discussed what other students think about excessive drinking. The correct answer was “yes” for IN and Combined and “no” for DN. Nearly all students in the IN and Combined conditions responded correctly, but over half of those in the DN condition responded incorrectly, percent responding “yes”: Overall: 83%, IN: 97%, Combined: 100%, DN: 57%. The final question asked whether students discussed how many calories are in alcoholic beverages. The correct answer was “no” for all groups. Nearly all students correctly reported “no”, percent responding “no”: Overall: 97%, IN: 100%, Combined: 94%, DN: 100%.

Changes in Normative Perceptions. In addition to these five questions, we used the manipulation check to examine hypothesis four that normative feedback would change matched norms by looking at changes in normative perceptions across groups in two ways. First we calculated change scores from BL to Post and from BL to FU, and then ran a series of one-sample t-tests comparing the change to zero within each condition for both of the norms assessments (i.e., DN grid, IN approval ratings). These results are presented in Figures 3 and 4. In sum, all active conditions (i.e., DN, IN, and Combined) facilitated significant changes in both

norms assessments from both BL to Post and BL to FU (ps < .01). Thus, the hypothesis that intervention conditions would differentially change matched norms was not supported, suggesting that receiving either intervention elicited changes in perceptions of both DN and IN. In the control condition, all but one of the four change scores was not significantly different from zero (ps > .05). Specifically, there was a significant decrease in approval ratings from BL to FU on the injunctive norms approval scale ($p < .05$), suggesting some natural decrease in injunctive norms over the full study period.

Second, we ran two mixed models ANOVAs examining changes over time (i.e., BL to Post to FU) for both norms measures and compared changes in norms across the four treatment conditions. These results are displayed in Figures 5 and 6. In the model assessing changes across time by condition for the descriptive norms grid measure there was a significant main effect for change in descriptive norms ratings over time, $F(2, 254) = 27.41$, $p < .01$, partial $\eta^2 = .18$, and a significant change over time by condition interaction, $F(6, 254) = 2.15$, $p = .05$, partial $\eta^2 = .05$. The linear trend for change in approval overtime was significant, $F(1, 127) = 34.69$, $p < .01$, partial $\eta^2 = .22$, but the quadratic trend was not, $F(1, 127) = .72$, $p = .54$, partial $\eta^2 = .02$. There was an overall main effect for condition, $F(3, 127) = 9.89$, $p < .01$, partial $\eta^2 = .19$, and post-hoc tests using Tukey's HSD identified significant differences between the Control group and all of the active treatment conditions (i.e., DN, IN and Combined; ps < .01), but not between any of the active conditions (i.e., DN vs. IN, DN vs. Combined, IN vs. Combined; ps > .05).

Probing the interaction revealed significant negative linear trends for all active conditions (IN: $F(1,36) = 7.01$, $p = .01$, $\eta^2 = .16$; DN: $F(1,32) = 17.35$, $p < .01$, $\eta^2 = .35$; Combined: $F(1,30) = 13.29$, $p < .01$, $\eta^2 = .16$), but not for the control condition, $F(1,29) = 3.15$, $p = .09$, $\eta^2 = .10$.

There were significant quadratic trends for only the DN, $F(1,32) = 4.06$, $p = .05$, $\eta^2 = .11$, and Combined, $F(1,30) = 16.02$, $p < .01$, $\eta^2 = .35$, conditions, but not for IN, $F(1,36) = 3.33$, $p = .08$, $\eta^2 = .09$, or Control, $F(1,29) = 1.20$, $p = .28$, $\eta^2 = .04$, conditions. This suggests that DN feedback facilitated reductions in DN perceptions in all three active conditions, but not the control condition, and that the large changes seen in the DN and Combined conditions on DN perceptions from baseline to post-intervention were attenuated from post-intervention to follow-up, whereas the trend continued at a constant rate for the IN group.

In the model assessing changes across time by condition for the injunctive norms approval measure there was a significant main effect for change in approval ratings over time, $F(2, 256) = 140.87$, $p < .01$, partial $\eta^2 = .52$, and a significant change over time by condition interaction, $F(6, 256) = 14.25$, $p < .01$, partial $\eta^2 = .25$. Both the linear and quadratic trends for change in approval overtime were significant, Linear: $F(1, 128) = 236.74$, $p < .01$, partial $\eta^2 = .65$; Quadratic: $F(1, 128) = 16.57$, $p < .01$, partial $\eta^2 = .28$. There was an overall main effect for condition, $F(3, 128) = 6.95$, $p < .01$, partial $\eta^2 = .14$, and post-hoc tests using Tukey's HSD identified significant differences between the Control group and IN and between the Control group and the Combined group ($ps < .01$), but not between the Control group and DN or between any of the active conditions (i.e., DN vs. IN, DN vs. Combined, IN vs. Combined; $ps > .05$).

Probing the interaction, revealed significant linear slopes for all conditions (Control: $F(1,30) = 7.57$, $p = .01$, $\eta^2 = .20$; IN: $F(1,36) = 101.45$, $p < .01$, $\eta^2 = .74$; DN: $F(1,32) = 50.01$, $p < .01$, $\eta^2 = .61$; Combined: $F(1,30) = 106.03$, $p < .01$, $\eta^2 = .78$); however, all linear slopes were negative with the exception of the control condition, which was positive. Thus, the control group increased their IN perceptions while the active conditions decreased their IN perceptions from

Baseline to Follow-up. When we assessed quadratic trends, we found significant quadratic effects for all but the DN condition (Control: $F(1,30) = 8.16$, $p = .01$, $\eta^2 = .20$; IN: $F(1,36) = 39.84$, $p < .01$, $\eta^2 = .53$; DN: $F(1,32) = 1.12$, $p = .30$, $\eta^2 = .03$; Combined: $F(1,30) = 39.41$, $p < .01$, $\eta^2 = ,57$), indicating large changes in normative perceptions from baseline to post-intervention and then smaller changes from post-intervention to follow-up. These changes were negative for IN, DN, and Combined conditions and positive for the control condition.

These results demonstrated that students did not distinguish between the type of normative feedback they were presented with on the manipulation check. Specifically, students reported believing they discussed both DN and IN information when they were in either the IN or DN only conditions. Moreover, changes in both DN and IN perceptions were observed among all three active conditions.

Multi-group serial mediation path analysis. A series of six multi-group serial mediation path analyses were run; one with each dependent variable (i.e., tBAC: typical blood alcohol content, pBAC: peak blood alcohol content, tDPW: drinks per week on a typical week, hDPW: drinks per week on a heavy week, Max: maximum drinks on a single drinking occasion, ARC: alcohol related consequences). Figure 1 presents the path diagram for these models. In each model, the multi-group portion was between heavy and light drinkers, defined by whether their self-reported drinking at baseline was above or below the number of drinks per week presented in the DN feedback, and the serial mediation was from the deviation coded intervention condition variable to the alcohol use or consequences variable through actual-ideal discrepancy (AID) and through positive (PA) and negative affect (NA). In each model we used bootstrapping and bias-corrected confidence intervals as is recommended for models when

power is a concern (Hayes & Scharkow, 2013). In the models described later we will base our determination of statistical significance on the asymmetrical bias-corrected confidence intervals rather than on p-values, although we report both. We also refer to the models by the alcohol use or consequences variable (e.g., tBAC, Max) to limit confusion. However, it is important to note that, for example, when we report the relationship between AID and NA for tBAC, we are referring to the bi-variate relationship between AID and NA within the tBAC model. We tested all direct effects within Figure 1 as well as all indirect effects from condition to alcohol use or consequences through AID, PA and NA. We also controlled for the influence of time to follow-up and baseline values of the dependent variable for each model by having time to follow-up and matched baseline values predict the dependent alcohol use or consequences variable and constraining those paths to be equal across drinker status groups[1]. Tables 7 and 8 identify the direct effects that were significant in each model, with each model identified by the dependent variable (i.e., alcohol use and consequences variables). Indirect paths will be reported separately in the text.

Overall model fit. Overall model fit for the six path models is presented in Table 9. Model fit ranged from poor (i.e., Max drinks) to excellent (pBAC), using Hu and Bentler's (1999) cutoff criteria for fit indexes in covariance structure analysis. The Chi-Square result was non-significant for three out of six models (i.e., tBAC, pBAC, and ARC), indicating that the data fit the model specifications for half of the dependent variables tested. Hu and Bentler (1999) also proposed cut off scores "close to".95 for the Tucker-Lewis Index (TLI) and the Comparative Fit

[1] We also ran all models with gender included as an additional covariate. This addition resulted in deterioration in model fit in all cases and did not change the pattern of findings within the models. Thus, we have decided to present the models without gender included as a covariate.

Index (CFI), and Standardized Root Mean Squared Residual (SRMR) and Root Mean Squared Error of Approximation (RMSEA) values "close to .06" (Hu & Bentler, 1999, p. 1). Using these cut off criteria only the pBAC model would be considered excellent fitting, but the other models were satisfactory using at least one criterion. Most, often the models presented here fit best using the SRMR index. Finally, the Sample Size Adjusted Bayesian Information Criterion (saBIC; Sclove, 1987) can be used to compare models. The saBIC maximizes the likelihood ratio statistic while rewarding parsimony. Low values indicate better model fit, and the model with the lowest saBIC is generally preferred (Muthén and Muthén, 2000). However, in the current study, all models were specified equally (i.e., no differences regarding parsimony), so the saBIC provides us with an index of comparative model fit. Again, using this metric, all models fit similarly well with the exception of pBAC, which fits comparably better.

Direct effects regardless of drinker status. The direct path from time to follow-up to alcohol use and consequences was only significant for hDPW, b = -.01, SE = .003, p = .02, 95% CI = [-.01, -.001]. In contrast, the direct path from baseline alcohol use and consequences to follow-up alcohol use and consequences was significant in all models, tBAC: b = .36, SE = .15, p = .02, 95% CI = [.08, .68]; pBAC: b = .51, SE = .10, p < .01, 95% CI = [.31, .69]; tDPW: b = .51, SE = .09, p < .01, 95% CI = [.33, .69]; hDPW: b = .42, SE = .08, p < .01, 95% CI = [.25, .56]; Max: b = .49, SE = .13, p < .01, 95% CI = [.25, .74]; ARC: b = .52, SE = .10, p < .01, 95% CI = [.33, .71].

Direct effects for light drinkers. The direct effect comparing DN to IN was significant for tBAC, b = -.14, SE = .08, p = .08, 95% CI = [-.33, -.02], such that those in the DN condition had higher tBACs at follow-up compared to those in the IN condition. The direct effect from NA

to ARC was significant, b = .05, SE = .04, p = .17, 95% CI = [.003, .149], such that those with higher NA also had higher ARC at follow-up. The direct effect comparing DN and Combined on AID was significant for Max, b = 2.46, SE = 1.41, p = .03, 95% CI = [.46, 4.80], and ARC, b = -2.45, SE = 1.10, p = .03, 95% CI = [-4.89, -.50], such that those in the DN condition had higher AID compared to those in the Combined condition. The direct effect comparing IN and Combined on AID was significant for Max, b = 1.78, SE = .88, p = .04, 95% CI = [.20, 3.57], such that those in the IN condition had higher AID compared to those in the combined condition. The direct effect comparing Combined and Control on AID was significant for Max, b = 2.20, SE = 1.16, p = .06, 95% CI = [.25, 4.88], such that those in the Control condition had higher AID compared to those in the Combined condition. AID significantly predicted NA for tBAC, b = .93, SE = .51, p = .07, 95% CI = [.07, 2.06], tDPW, b = .91, SE = .51, p = .07, 95% CI = [.04, 2.16], and Max, b = .95, SE = .47, p = .05, 95% CI = [.08, 1.99], such that those who reported higher AID also reported higher NA. AID significantly predicted PA for ARC, b = 1.18, SE = .59, p = .05, 95% CI = [.17, 2.53], such that those who reported higher PA also reported more ARC.

Direct effects for heavy drinkers. The direct effect comparing DN and Combined was significant for tDPW, b = -.57, SE = .30, p = .06, 95% CI = [-1.20, -.03], and ARC, b = -.46, SE = .23, p = .04, 95% CI = [-.94, -.05], such that those in the DN condition reported higher tDPW and more ARC compared to those in the Combined condition. The direct effect comparing DN and Control was significant for tDPW, b = -.80, SE = .28, p = .01, 95% CI = [-1.29, -.19], such that those in the DN condition reported more tDPW compared to those in the Control condition. The direct effect comparing IN to Control was significant for pBAC, b = -.07, SE = .03, p = .02,

95% CI = [-.13, -.01], and hDPW, *b* = -.48, *SE* = .23, *p* = .04, 95% CI = [-.93, -.003], such that those in the IN condition reported higher pBACs and more hDPW compared to those in the Control condition. The direct effect from AID to follow-up alcohol use and consequences was significant for tBAC, *b* = .02, *SE* = .01, *p* = .01, 95% CI = [.01, .03], tDPW, *b* = .17, *SE* = .05, *p* < .01, 95% CI = [.08, .26], hDPW, *b* = .17, *SE* = .05, *p* < .01, 95% CI = [.09, .29], and Max, *b* = .48, *SE* = .23, *p* = .04, 95% CI = [.07, .95], such that those with a higher AID also reporting higher levels of follow-up alcohol use. The direct path from AID to NA was significant for all alcohol use and consequences models (tBAC: *b* = 1.08, *SE* = .33, *p* < .01, 95% CI = [.38, 1.67]; pBAC: *b* = 1.08, *SE* = .33, *p* < .01, 95% CI = [.43, 1.75]; tDPW: *b* = 1.08, *SE* = .32, *p* < .01, 95% CI = [.43, 1.76]; hDPW: *b* = 1.08, *SE* = .32, *p* < .01, 95% CI = [.42, 1.67]; Max: *b* = 1.25, SE = .34, *p* < .01, 95% CI = [.56, 1.97]; ARC: *b* = 1.08, *SE* = .32, *p* < .01, 95% CI = [.48, 1.77]), such that those with higher AID also had higher NA. The direct effect from AID to PA was significant for all alcohol use and consequences models besides tBAC (pBAC: *b* = .41, *SE* = .19, *p* = .03, 95% CI = [.04, .82]; tDPW: *b* = .41, *SE* = .19, *p* = .03, 95% CI = [.04, .82]; hDPW: *b* = .41, *SE* = .20, p = .04, 95% CI = [.02, .77]; Max: *b* = .55, *SE* = .21, *p* = .01, 95% CI = [.10, .93]; ARC: *b* = .41, *SE* = .20, *p* = .04, 95% CI = [.04, .81]), such that those with higher AID also reported higher PA.

Indirect effects regardless of drinker status. None of the indirect effects tested were significant for heavy drinkers. For light drinkers four of the indirect effects tested were significant, but only for Max and ARC. The path from DN vs. Combined to AID to NA to Alcohol use or consequences was significant in both the Max and ARC models, Max: *b* = -.15, *SE* = .46, *p* = .74, 95% CI = [-6.03, -.06]; ARC: *b* = -.57, *SE* = .33, *p* = .09, 95% CI = [-1.51, -

.07]. The path from DN vs. Combined to AID to alcohol use or consequences was significant in only the ARC model, b = -.52, SE = .36, p = .15, 95% CI = [-1.42, -.00]. The path from IN vs. Combined to AID to NA to Alcohol use or consequences was significant for only the Max model, b = -1.78, SE = 1.03, p = .24, 95% CI = [-4.60, -.05]. The path from Combined vs. Control to AID to NA to Alcohol use or consequences was significant in both the Max and ARC models, Max: b = 2.20, SE = 1.16, p = .04, 95% CI = [.25, 4.88]; ARC: b = .08, SE = .09, p = .39, 95% CI = [.00, .52].

To summarize the results of the path analyses, there were only differences in follow-up alcohol use and consequences among heavy drinkers. Those in the DN condition drank more at follow-up than those in the Combined condition, and those in either DN or IN conditions reported drinking more at follow-up than those in the Control condition. The link between intervention condition and AID was only found among light drinkers, such that all conditions had higher AID at follow-up than those in the Combined condition. The strongest and most robust association was between AID and affect, such that for light drinkers there was a strong association between AID and NA, and among heavy drinkers there was a strong association between AID and both NA and PA. Finally, neither PA nor NA predicted follow-up alcohol use or consequences in either heavy or light drinkers. Thus, the causal chain was broken, resulting in only a few significant indirect effects only among light drinkers, which always included NA and either Max drinks or ARC.

Discussion

This study examined changes in alcohol use and consequences among heavy and light drinking college students following either descriptive norms feedback, injunctive norms

feedback, both descriptive and injunctive norms feedback, or assessment only control. We also examined a causal chain of effects from type of norms feedback through actual-ideal discrepancy in drinking behaviors and positive and negative affect to alcohol use and consequences. The first hypothesis that this study was designed to test was that participants in the intervention conditions would reduce alcohol consumption at follow-up more than the control group participants. The data did not support this prediction. Rather than observing decreases in drinking and consequences from baseline to follow-up relative to the control group, those in the norms conditions tended to report the same pattern of drinking across time relative to the control condition, or even reported drinking more than those who did not receive normative feedback. Specifically, there were no differences in follow-up drinking or ARC among conditions for light drinkers, and among heavy drinkers the DN group reported higher numbers of tDPW and more ARC than the Control group, and the IN group reported higher pBAC levels and higher numbers of hDPW compared to the control group. We did hypothesize that some drinkers might increase their drinking; however, our hypotheses, theory (c.f., Cialdini et al., 1990), and prior research from related fields (e.g., Shultz et al, 2007), would have predicted that light drinkers but not heavy drinkers would be more likely to increase their drinking. Thus, these findings are unexpected and inconsistent with prior research on DN interventions with college drinkers. Our results may be different from previous studies due to recruiting a sample of participants that were abnormally heavy drinkers. Aronson (1997) proposes that in order for cognitive dissonance to motivate behavior change it must conflict with one's self concept. In this sample of heavy drinkers, most students reported normative perceptions that were more permissive than students in previous studies conducted at Syracuse University. Thus, it may be possible that for these

students learning that they drank more than the average same sex college student and held more permissive attitudes than the same sex college student did not facilitate the necessary internal conflict to motivate behavior change.

Our second hypothesis was that the Combined intervention would produce greater decreases in drinking than either of the individual interventions. We found some support for this hypothesis among heavy drinkers. The DN group reported higher levels of tDPW and ARC compared to the Combined group, suggesting an added benefit of IN feedback for heavy drinkers. There were no differences between the IN group and the Combined group on follow-up drinking or ARC. This suggests that IN feedback alone is associated with equivalent changes in follow-up alcohol use and consequences as IN feedback in conjunction with DN feedback. The addition of IN feedback may have been beneficial in helping heavy drinkers consume fewer drinks in a typical week and experience fewer ARC than DN alone. When comparing the DN and IN groups, the only significant difference was that those in the DN condition reported higher tBAC levels at follow-up compared to those in the IN condition, giving a potential advantage for IN feedback alone over DN feedback alone. This finding also supports the idea that DN and IN constructs are not interchangeable (Lee et al., 2007), and specifically, students may change their drinking patterns to a greater degree from discussing IN feedback than from discussing DN feedback (Larimer, 2012).

The third hypothesis that the study was designed to test concerned the hypothesized chain of effects from condition to changes in drinking and ARC at follow-up through AID and PA and/or NA. Results from the path analysis among light drinkers revealed lower levels of AID at follow-up in the Combined condition compared to DN, IN and Control conditions. This finding

is appropriate because light drinkers in the Combined condition would have received two types of feedback confirming that they are light drinkers. Among heavy drinkers, there were no differences among conditions on AID ratings at follow-up. It is possible that for heavy drinkers, the normative feedback made salient a self-other difference, rather than a self-focused actual-ideal discrepancy as is assessed in the AID measure.

One of the most robust findings was the link between AID and NA. Among light drinkers, higher AID was associated with higher NA for three out of six alcohol use variables. Among heavy drinkers this same positive relationship was significant for all six alcohol use variables. Thus, a greater discrepancy between one's actual and ideal drinking pattern is associated with greater negative affect. Although the link was strong between AID and NA among both light and heavy drinkers, the link between AID and PA was not significant for any of the models for light drinkers, and was significant in five out of six models for heavy drinkers. Taken together, these results show that heavy drinkers have more affective reactions to norms feedback regardless of type. In part, the high ratings among heavy drinkers on both PA and NA may be suggestive of a lack of sensitivity in the PANAS positive and negative affect scales to capture fully heavy drinkers reactions to hearing that they drink more than other students and other students do not approve of their current drinking. Whereas for light drinkers, the relationship between higher AID and NA is consistent with cognitive dissonance theory, because for those light drinkers whose drinking was far from their ideal, they would be expected to feel negative affect, which in turn may have maintained their current drinking.

The next link in the model's causal chain was the association between affect and outcome. Among light drinkers both NA and PA predicted more ARC, whereas neither NA nor

PA predicted outcomes for heavy drinkers. Moreover, among heavy drinkers there was a direct effect of AID on outcome for four out of six alcohol use variables, such that higher ratings of AID was associated with more drinking. One possible explanation for this finding is that even though heavy drinkers do not want to drink heavily forever, they are not motivated to change their drinking right now (Colby, Colby, & Raymond, 2009). In addition, these findings may indicate the presence of a variable not measured in this study such as self-efficacy, motivation, or ability to use protective behavioral strategies precluded heavy drinkers from reducing their alcohol use and consequences. If heavy drinkers, were motivated to reduce their drinking, but did not have the skills, motivation, or confidence to do so they may respond with elevated and inconsistent affect and heavy drinking. In fact, if heavy drinkers were drinking to blunt their affect, we would expect to see no association between affect and outcome because heavy drinkers were using alcohol to avoid their affective responses.

Given that the pattern of direct effects were inconsistent or not significant along the causal chain, it follows that none of the indirect effects were significant for heavy drinkers, and that among light drinkers there were only a few indirect paths that were significant. Specifically, in both cases (i.e., among light and heavy drinkers) the link between affect and outcome was not significant. In each case when an indirect path was significant it included NA and not PA, and the comparison always included the Combined group and either ARC or Max drinks as the outcome variables. It seems possible that if there is a chain of effects from condition to outcome through AID and affect for light drinkers. These effects were driven by negative rather than positive affect changes consistent with cognitive dissonance theory (Festinger, 1954; Aronson, 1997). The lack of significant indirect effects is consistent with Collins et al. (2002) and

McNally et al. (2005) who failed to find evidence for AID or AID and NA, respectively, mediating the relationship between treatment condition and outcome, using a less rigorous statistical method. The current study can help to rule out statistical method as the cause of the failed mediation tests. Further, Murphy et al. (2010) could not test for mediation because they failed to find differences in outcome measure among treatment conditions. The current study, similarly did not find indirect effects potentially in part because the direct effect between treatment condition and outcomes were not significant.

Considering the pattern of findings predicted in Table 1 and the results of the path analysis, overall our primary hypotheses did not stand up well to the data. We can assess study design to look for clues as to what may have resulted in this surprising pattern of findings. First, the randomization procedure produced four groups that did not differ from one another on any baseline values. Second, participants reported feeling satisfied with the intervention, likely to share the information they discussed, and reported they found the interventions to be "very interesting". Third, our fidelity check data revealed near flawless delivery of the intervention content by the interventionists. However, the data from our manipulation check items raised several questions.

We conducted the manipulation check in two ways, by (a) examining responses to yes or no questions about what information was discussed, and (b) examining changes in norms ratings by condition (i.e., testing hypothesis 4). The five yes or no questions revealed a correspondence bias (Gilbert & Malone, 1995). Students assumed that they learned about others' behavior when they actually only learned about others' attitudes. In addition, students assumed they learned others' attitudes when they learned about others' behavior; however, this pattern was less

frequent. This implies that the conditions were not distinct. In fact, both types of normative perceptions changed following either type of norms feedback. This was shown by participants in the IN condition incorrectly thinking they learned how much other students drank, more often than those in the DN condition falsely believing they learned about the attitudes of other students. On items unrelated to norms (e.g., how to reduce BAC, how to reduce calories, and which organs are effected by alcohol) the vast majority of students responded correctly that they had not discussed those topics regardless of condition.

Similar findings were seen in the data on changes in injunctive and descriptive norms ratings across time. All active conditions changed their normative perceptions. Specifically, there were no differences in IN approval ratings among the active conditions, and the control condition was different from all but the DN condition. On the DN grid measures, all active conditions changed more than the control conditions, and there were no differences in change among participants in the active conditions. This pattern of findings suggests that if students received either DN, IN, or both they responded by adjusting their normative perceptions of both DN and IN equally. This is consistent with results presented by Prince and Carey (2010) who demonstrated a correspondence bias among students receiving IN feedback. If changes in norms are the mechanism of behavior change, then if the intervention conditions did not differentially change norms, it follows that there would not be differential changes in outcome measures among the active conditions. However, future studies need to examine this relationship more closely.

This study has a number of strengths. First, this study used norms theory to expand our knowledge and understanding of how college student drinking is affected by both IN and DN

feedback. Further, it provided a manualized IN intervention that can be used as a model for future studies seeking to improve upon the current findings. It used rigorous statistical and research methodology. It was one of the first studies to examine psychological process variables that may underlie changes in drinking and ARC following normative feedback. More importantly, it demonstrated that IN feedback and DN feedback similarly facilitate changes in students' normative perceptions on both descriptive and injunctive norms. This finding suggests that changes in perceived norms are not specific. Rather, they move together in response to either type of feedback, similar to results reported by Prince and Carey (2010).

However there are several limitations in the study that should be considered in interpreting its findings. First, there was a lengthy time-to-follow-up for some participants, which may have affected the results. There is some evidence to suggest that the effects of brief interventions decline after a few months (cf. Collins et al., 2002; Scott-Sheldon et al., 2014). We addressed this limitation by controlling for time-to-follow-up in the path analyses. If we had excluded people who completed the study late, we would have been underpowered to conduct the analyses as planned. Second, this study would have benefited from analyses of order effects within the combined condition. However, participants were not randomized within that condition (i.e., every participant in the combined condition received DN then IN). The lack of order analyses precludes us from assessing whether the effects would be different if IN feedback was presented first. Third, overall model fit for these models ranged from poor (e.g., hDPW) to excellent (e.g., pBAC). We discussed findings from all models, but readers are urged to interpret these findings with caution. In addition, as can be seen from Tables 7 and 8 few of the effects were robust across multiple dependent variables. Finally, Carey et al.'s (2007) meta-analysis

reported that interventions were less successful when targeting heavy drinkers, which may help explain the difficulty in this study to elicit changes in drinking following brief norms feedback in a heavy drinking sample.

In conclusion, the data suggest that DN, IN, and Combined feedback are all associated with similar changes in normative perceptions. Given that this study was designed to maximize the impact of normative feedback by being personalized, delivered face-to-face, and delivered using a Motivational Interviewing style, we can conclude that exposure to the 3 types of interventions will be associated with similar degrees of changes in normative perceptions. Even though this study examined three underlying process variables (i.e., AID, PA and NA), there are additional constructs that may have influenced the results, but were not assessed. These include self-efficacy to change one's drinking, motivation or readiness to change one's drinking, and ability to effectively use protective behavioral strategies. In addition, future studies should replicate the current study with a more inclusive assessment battery, a larger sample and with a stricter time to follow-up protocol.

The premise of this project was that receiving feedback that one drinks more than or holds more permissive attitudes about excessive drinking would elicit changes in AID and the cognitive dissonance, experienced as affect, would then result in changes in drinking. By drawing comparisons between one's own use and the use of others or on one's own attitudes and the attitudes of others, students would be motivated to change their drinking. We expected heavy drinkers to resolve this dissonance through reducing drinking, and we expected light drinkers to be encouraged by the feedback to maintain their current drinking. This approach carries with it the assumption that everyone wants to be an average drinker. In fact, social norms theory asserts

this assumption (Cialdin, Reno, & Kallgren, 1990). However, Aronson (1997) would argue that learning that one is a heavy drinker is not enough: there needs to be a conflict with self-concept. If students did not find the material threatening to their self-concept they would not experience cognitive dissonance motivating them to change. Future studies need to assess students' self-concept with regard to excessive drinking as a potential mediator of the relationship between normative feedback and alcohol use and consequences.

Appendix A

Surveys

INITIAL SURVEY
(Male)

Personal Information: *Please check or fill in the answers that best describe you.*

1) Gender: _____ Male _____ Female

2) Do you have any siblings?

_____ If yes, indicate number. If no, write 0.

3) What is your Birth Order

____ If you are the oldest of your siblings write 1, if you have one older sibling write 2, two older siblings 3, and so on.

4) Do you consider yourself Hispanic or Latino?

_____ Yes _____ no

5) Choose one racial group that best describes you:

____ White

____ Black or African-American

____ Asian

____ Native American or Native Alaskan

____ Native Hawaiian or other Pacific Islander

____Other _____ (please specify)

6) Do you consider yourself multiracial?

_____ Yes _____ No

7) Current residence:

____ On-campus dormitory

____ South Campus

____ Off-campus house or apartment

____ Fraternity house

____ Sorority house

____ With family

____ Other _____ (please specify)

8) Your height: _____ feet _____ inches

9) Your weight: _____ lbs.

10) Has anyone in your family ever had problems due to their alcohol use?

____ No

____ Mother

____ Father

____ Sibling

____ Grandparent

____ Aunt or Uncle

____ Other Relative_____ (please specify)

Alcohol Use

1 standard drink =	12 oz beer 5 oz wine 1.5 oz shot of liquor, straight or in a mixed drink

1. Please estimate the average number of standard drinks you consumed on a typical drinking day in the past 30 days.

   _____ drinks

2. When you drink, how many hours typically elapse from the start of your first drink to the completion of your last drink?

   _____ hours

3. Think of the one day you consumed **the most** alcohol in the last month: how many standard drinks did you consume on that day?

   _____ drinks

   3a. How many days in the past month have you consumed that number of drinks?

   _____ days

4. On this heaviest drinking day, approximately how many hours passed from the beginning of the first drink to the finishing of the last?

   _____ hours

5. During the past two weeks, how many times had you consumed five or more drinks on one drinking occasion?

   _____ times

6. On how many days in the past month (i.e., the past 30 days) did you consume any amount of alcohol?

   _____ days

Alcohol Use Grid – **Typical Week**

1. Consider a typical week during the **last month**. How much alcohol on average (measured in number of drinks) do **YOU** consume on each day of a typical week?

On a typical MONDAY I consume ____ drink(s)	_____
On a typical TUESDAY I consume ____ drink(s)	_____
On a typical WEDNESDAY I consume ____ drink(s)	_____
On a typical THURSDAY I consume ____ drink(s)	_____
On a typical FRIDAY I consume ____ drink(s)	_____
On a typical SATURDAY I consume ____ drink(s)	_____
On a typical SUNDAY I consume ____ drink(s)	_____

2. What is your average frequency of drinking?

- ❑ Never
- ❑ Less than once per month
- ❑ Once a month
- ❑ Two times a month
- ❑ Three times a month
- ❑ Once a week
- ❑ Two times a week
- ❑ Three times a week
- ❑ Four times a week
- ❑ Five times a week
- ❑ Six times a week
- ❑ Every day

3. What is the average number of drinks that you drink on given occasion?

- ❑ 0 drinks
- ❑ 1 drink
- ❑ 2 drinks
- ❑ 3 drinks
- ❑ 4 drinks
- ❑ 5 drinks
- ❑ 6 drinks
- ❑ 7 drinks
- ❑ 8 drinks
- ❑ 9 drinks
- ❑ 10 drinks
- ❑ 11 drinks
- ❑ 12 drinks
- ❑ 13 drinks
- ❑ 14 drinks
- ❑ 15 drinks
- ❑ 16 drinks
- ❑ 17 drinks
- ❑ 18 drinks
- ❑ 19 drinks
- ❑ 20 drinks
- ❑ 21 drinks
- ❑ 22 drinks
- ❑ 23 drinks
- ❑ 24 drinks
- ❑ 25 or more drinks

Alcohol Use Grid – **Heavy Week**

1. Consider a the week during the **last month when you drank the most alcohol**. How much alcohol (measured in number of drinks) did **YOU** consume on each day of that week?

On that MONDAY I consumed ____ drink(s)	_____
On that TUESDAY I consumed ____ drink(s)	_____
On that WEDNESDAY I consumed ____ drink(s)	_____
On that THURSDAY I consumed ____ drink(s)	_____
On that FRIDAY I consumed ____ drink(s)	_____
On that SATURDAY I consumed ____ drink(s)	_____
On that SUNDAY I consumed ____ drink(s)	_____

IN part 1
Please answer the following questions about the **typical male SU Student**

	Strong Disapproval	**Moderate Disapproval**	**Mild Disapproval**	**Mild Approval**	**Moderate Approval**	**Strong Approval**
1. How would male students at SU respond if they knew: You drank alcohol every weekend?						
2. How would male students at SU respond if they knew: You drank alcohol daily?						
3. How would male students at SU respond if they knew: You drove a car after drinking?						
4. How would male students at SU respond if they knew: You drank enough alcohol to pass out?						
5. How would male students at SU respond if they knew: You got behind in your school work because of drinking?						
6. How would male students at SU respond if they knew: You had violated the university alcohol policy once?						

	Strong Disapproval	**Moderate Disapproval**	**Mild Disapproval**	**Mild Approval**	**Moderate Approval**	**Strong Approval**
7. How would male students at SU respond if they knew: You had violated the university alcohol policy twice?						
8. How would male students at SU respond if they knew: You had a blackout (couldn't remember what you did/said) when you were drinking?						
9. How would male students at SU respond if they knew: You decided not to drink at a party?						
10. How would male students at SU respond if they knew: You alternated nonalcoholic drinks with alcoholic drinks at a party?						

DN part 1

Please answer the following questions with regard to the average male SU student

# of drinks normally consumed by *average male SU student* on **Sunday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Monday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Tuesday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Wednesday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Thursday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Friday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Saturday** in last 30 days	Write in

Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ)

Below is a list of things that sometimes happen to people either during or after they have been drinking alcohol. Next to each item below, please mark an "X" in either the NO or the YES column to indicate whether or not that item describes something that has happened **To You** ***IN THE PAST ONE MONTH.***

In the **past month…**	**NO**	**YES**
1. I have had a hangover (headache, sick stomach) the morning after I had been drinking.		
2. I have taken foolish risks when I have been drinking.		
3. I've not been able to remember large stretches of time while drinking heavily.		
4. The quality of my work or school work has suffered because of my drinking.		
5. I have had less energy or felt tired because of my drinking.		
6. My drinking has gotten me into sexual situations I later regretted.		
7. I often have ended up drinking on nights when I had planned not to drink.		
8. My physical appearance has been harmed by my drinking.		
9. While drinking, I have said or done embarrassing things.		
10. I have felt very sick to my stomach or thrown up after drinking.		
11. I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.		
12. When drinking, I have done impulsive things I regretted later.		
13. I have been overweight because of drinking.		
14. I have woken up in an unexpected place after heavy drinking.		
15. I have spent too much time drinking.		
16. I have felt badly about myself because of my drinking.		
17. My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.		
18. I have felt like I needed a drink after I'd gotten up (that is, before breakfast).		
19. I have driven a car when I knew I had too much to drink to drive safely.		
20. I have neglected my obligations to family, work, or school because of drinking.		
21. I have often found it difficult to limit how much I drink.		
22. I have passed out from drinking.		
23. I have become very rude, obnoxious, or insulting after drinking.		
24. I have found that I needed larger amounts of alcohol to feel any effect, or that I could		

no longer get high or drunk on the same amount that used to get me high or drunk.		

Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ)

Below is a list of things that sometimes happen to people either during or after they have been drinking alcohol. Next to each item below, please mark **how acceptable *You*** *find each of the following: Using the following scale:*

1 – Highly Unacceptable, 2-Moderately Unacceptable, 3- Fairly Unacceptable, 4- Fairly Acceptable, 5-Moderately Acceptable, 6-Highly Acceptable

In the **past month…**	**Rating**
1. Waking up with a hangover (headache, sick stomach) the morning after drinking.	
2. Taking foolish risks when drinking.	
3. Not being able to remember large stretches of time when drinking heavily.	
4. Having the quality of work or school work suffer because of drinking.	
5. Having less energy or feeling tired because drinking.	
6. Getting into sexual situations that may later be regretted because of drinking.	
7. Ending up drinking on nights when it was previously unplanned.	
8. Having one's physical appearance harmed because of drinking.	
9. Saying or doing embarrassing things while drinking.	
10. Feeling very sick or throwing up after drinking.	
11. Not going to work or missing classes at school because of drinking, a hangover, or illness caused by drinking.	
12. Doing impulsive things may later be regretted when drinking.	
13. Becoming overweight because of drinking.	
14. Waking up in an unexpected place after heavy drinking.	
15. Spending too much time drinking.	
16. Feeling badly about myself because of my drinking.	
17. Having problems created between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives because of drinking.	
18. Needing a drink after waking up (that is, before breakfast).	
19. Driving a car after drinking too much to drive safely.	
20. Neglecting obligations to family, work, or school because of drinking.	
21. Finding it difficult to limit how much one drinks.	
22. Passing out from drinking.	
23. Becoming very rude, obnoxious, or insulting after drinking.	
24. Needing larger amounts of alcohol to feel any effect, or noticing that the same amount of alcohol no longer makes one feel as drunk as it previously did.	

Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ)

Below is a list of things that sometimes happen to people either during or after they have been drinking alcohol. Next to each item below, please mark how **acceptable you think the typical male SU student** *would find each of the following: Using the following scale:*

1 – Highly Unacceptable, 2-Moderately Unacceptable, 3- Fairly Unacceptable, 4- Fairly Acceptable, 5-Moderately Acceptable, 6-Highly Acceptable

In the **past month…**	**Rating**
1. Waking up with a hangover (headache, sick stomach) the morning after drinking.	
2. Taking foolish risks when drinking.	
3. Not being able to remember large stretches of time when drinking heavily.	
4. Having the quality of work or school work suffer because of drinking.	
5. Having less energy or feeling tired because drinking.	
6. Getting into sexual situations that may later be regretted because of drinking.	
7. Ending up drinking on nights when it was previously unplanned.	
8. Having one's physical appearance harmed because of drinking.	
9. Saying or doing embarrassing things while drinking.	
10. Feeling very sick or throwing up after drinking.	
11. Not going to work or missing classes at school because of drinking, a hangover, or illness caused by drinking.	
12. Doing impulsive things may later be regretted when drinking.	
13. Becoming overweight because of drinking.	
14. Waking up in an unexpected place after heavy drinking.	
15. Spending too much time drinking.	
16. Feeling badly about myself because of my drinking.	
17. Having problems created between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives because of drinking.	
18. Needing a drink after waking up (that is, before breakfast).	
19. Driving a car after drinking too much to drive safely.	
20. Neglecting obligations to family, work, or school because of drinking.	
21. Finding it difficult to limit how much one drinks.	
22. Passing out from drinking.	
23. Becoming very rude, obnoxious, or insulting after drinking.	
24. Needing larger amounts of alcohol to feel any effect, or noticing that the same amount of alcohol no longer makes one feel as drunk as it previously did.	

IN 2

***This section asks you to estimate what drinking the <u>typical male SU student</u>** would consider acceptable versus unacceptable.

1. Consider a typical week during the **last month**. How much alcohol on average (measured in number of drinks) would you estimate is the average amount a typical male SU student would consider to be an acceptable amount of alcohol to consume on each day of a typical week?

On a typical MONDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical TUESDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical WEDNESDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical THURSDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical FRIDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SATURDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SUNDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____

2. What is the average frequency of drinking that you estimate a **typical male SU student** would consider to be acceptable.

- ❑ Never
- ❑ Less than once per month
- ❑ Once a month
- ❑ Two times a month
- ❑ Three times a month
- ❑ Once a week
- ❑ Two times a week
- ❑ Three times a week
- ❑ Four times a week
- ❑ Five times a week
- ❑ Six times a week
- ❑ Every day

3. What is the average number of drinks you think a **typical male SU student** would find acceptable to drink on a given occasion?

- ❑ 0 drinks
- ❑ 1 drink
- ❑ 2 drinks
- ❑ 3 drinks
- ❑ 4 drinks
- ❑ 6 drinks
- ❑ 7 drinks
- ❑ 8 drinks
- ❑ 9 drinks
- ❑ 10 drinks
- ❑ 11 drinks
- ❑ 12 drinks
- ❑ 13 drinks
- ❑ 14 drinks
- ❑ 15 drinks
- ❑ 16 drinks
- ❑ 17 drinks
- ❑ 18 drinks
- ❑ 19 drinks
- ❑ 20 drinks
- ❑ 21 drinks
- ❑ 22 drinks
- ❑ 23 drinks
- ❑ 24 drinks
- ❑ 25 or more drinks

❑ 5 drinks

Injunctive Norms (continued)
***This section asks you to estimate what drinking <u>YOU</u>** would consider acceptable versus unacceptable.

1. Consider a typical week during the **last month**. How much alcohol on average (measured in number of drinks) do YOU consider to be an acceptable amount of alcohol to consume on each day of a typical week?

On a typical MONDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical TUESDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical WEDNESDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical THURSDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical FRIDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SATURDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SUNDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____

2. What is the average frequency of drinking that **you** consider to be acceptable.

❑ Never
❑ Less than once per month
❑ Once a month
❑ Two times a month
❑ Three times a month
❑ Once a week
❑ Two times a week
❑ Three times a week
❑ Four times a week
❑ Five times a week
❑ Six times a week
❑ Every day

3. What is the average number of drinks that **you** consider to be acceptable to drink on a given occasion?

❑ 0 drinks
❑ 1 drink
❑ 2 drinks
❑ 6 drinks
❑ 7 drinks
❑ 8 drinks
❑ 11 drinks
❑ 12 drinks
❑ 13 drinks
❑ 16 drinks
❑ 17 drinks
❑ 18 drinks
❑ 21 drinks
❑ 22 drinks
❑ 23 drinks

- ❑ 3 drinks
- ❑ 4 drinks
- ❑ 5 drinks
- ❑ 9 drinks
- ❑ 10 drinks
- ❑ 14 drinks
- ❑ 15 drinks
- ❑ 19 drinks
- ❑ 20 drinks
- ❑ 24 drinks
- ❑ 25 or more drinks

AID

Rate your current drinking pattern.

0 – I am at my ideal

1

2

3

4

5

6

7

8

9

10 – I am extremely far from my ideal

PANAS-X Protocol Illustrating "Past Few Weeks" Time Instructions

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way **during the past few weeks**.

Use the following scale to record your answers:

1	2	3	4	5
Very slightly or Not at all	A little	Moderately	Quite a Bit	Extremely

_____ cheerful	_____ sad	_____ active	_____ angry at self
_____ disgusted	_____ calm	_____ guilty	_____ enthusiastic
_____ attentive	_____ afraid	_____ joyful	_____ downhearted
_____ bashful	_____ tired	_____ nervous	_____ sheepish
_____ sluggish	_____ amazed	_____ lonely	_____ distressed
_____ daring	_____ shaky	_____ sleepy	_____ blameworthy
_____ surprised	_____ happy	_____ excited	_____ determined
_____ strong	_____ timid	_____ hostile	_____ frightened
_____ scornful	_____ alone	_____ proud	_____ astonished
_____ relaxed	_____ alert	_____ jittery	_____ interested
_____ irritable	_____ upset	_____ lively	_____ loathing
_____ delighted	_____ angry	_____ ashamed	_____ confident
_____ inspired	_____ bold	_____ at ease	_____ energetic
_____ fearless	_____ blue	_____ scared	_____ concentrating
_____ disgusted with self	_____ shy	_____ drowsy	_____ dissatisfied with self

Dissonance Thermometer

Instructions: Below are words that can describe different types of feelings. For each word, please indicate how much it describes ***how you are feeling right now*** by circling a number on the scale.

"1" means "does not apply at all" and "7" means "applies very much" to how you are feeling *right now*.

Don't spend much time thinking about each word. Just give a quick, gut-level response.

		Does Not Apply At All						Applies Very Much
1	Uncomfortable	1	2	3	4	5	6	7
2	Angry at myself	1	2	3	4	5	6	7
3	Shame	1	2	3	4	5	6	7
4	Uneasy	1	2	3	4	5	6	7
5	Friendly	1	2	3	4	5	6	7
6	Disgusted with myself	1	2	3	4	5	6	7
7	Embarrassed	1	2	3	4	5	6	7
8	Bothered	1	2	3	4	5	6	7
9	Optimistic	1	2	3	4	5	6	7
10	Annoyed at myself	1	2	3	4	5	6	7
11	Disappointed with myself	1	2	3	4	5	6	7
12	Happy	1	2	3	4	5	6	7
13	Energetic	1	2	3	4	5	6	7
14	Good	1	2	3	4	5	6	7

POST SURVEY

MC

Please select all of the following topics you discussed with your counselor:

_____ 1. information about how much alcohol other students drink

_____ 2. information about how to reduce BAC levels if you choose to drink

_____ 3. information about organs that can be damaged by too much alcohol

_____ 4. information about what other college students think about excessive drinking

_____ 5. information about how many calories are in alcoholic beverages

Satisfaction Items

1. Please rate your satisfaction with the conversation you just about alcohol use on campus.
    a. Highly satisfied
    b. Somewhat satisfied
    c. Slightly satisfied
    d. Slightly dissatisfied
    e. Somewhat dissatisfied
    f. Highly dissatisfied
2. How likely are you to share this information with others?
    a. Very likely
    b. Moderately likely
    c. Possibly
    d. Moderately unlikely
    e. Very unlikely
3. How interesting did you find the topics of conversation?
    a. Very interesting
    b. Moderately interesting
    c. Neither interesting or uninteresting
    d. Moderately uninteresting
    e. Very uninteresting

IN part 1
Please answer the following questions about the **typical male SU Student**

	Strong Disapproval	**Moderate Disapproval**	**Mild Disapproval**	**Mild Approval**	**Moderate Approval**	**Strong Approval**
1. How would male students at SU respond if they knew: You drank alcohol every weekend?						
2. How would male students at SU respond if they knew: You drank alcohol daily?						
3. How would male students at SU respond if they knew: You drove a car after drinking?						
4. How would male students at SU respond if they knew: You drank enough alcohol to pass out?						
5. How would male students at SU respond if they knew: You got behind in your school work because of drinking?						
6. How would male students at SU respond if they knew: You had violated the university alcohol policy once?						

	Strong Disapproval	**Moderate Disapproval**	**Mild Disapproval**	**Mild Approval**	**Moderate Approval**	**Strong Approval**
7. How would male students at SU respond if they knew: You had violated the university alcohol policy twice?						
8. How would male students at SU respond if they knew: You had a blackout (couldn't remember what you did/said) when you were drinking?						
9. How would male students at SU respond if they knew: You decided not to drink at a party?						
10. How would male students at SU respond if they knew: You alternated nonalcoholic drinks with alcoholic drinks at a party?						

DN part 1

Please answer the following questions with regard to the average male SU student

# of drinks normally consumed by *average male SU student* on **Sunday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Monday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Tuesday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Wednesday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Thursday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Friday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Saturday** in last 30 days	Write in

Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ)

Below is a list of things that sometimes happen to people either during or after they have been drinking alcohol. Next to each item below, please mark **how acceptable *You*** *find each of the following: Using the following scale:*

1 – Highly Unacceptable, 2-Moderately Unacceptable, 3- Fairly Unacceptable, 4- Fairly Acceptable, 5-Moderately Acceptable, 6-Highly Acceptable

In the **past month…**	**Rating**
1. Waking up with a hangover (headache, sick stomach) the morning after drinking.	
2. Taking foolish risks when drinking.	
3. Not being able to remember large stretches of time when drinking heavily.	
4. Having the quality of work or school work suffer because of drinking.	
5. Having less energy or feeling tired because drinking.	
6. Getting into sexual situations that may later be regretted because of drinking.	
7. Ending up drinking on nights when it was previously unplanned.	
8. Having one's physical appearance harmed because of drinking.	
9. Saying or doing embarrassing things while drinking.	
10. Feeling very sick or throwing up after drinking.	
11. Not going to work or missing classes at school because of drinking, a hangover, or illness caused by drinking.	
12. Doing impulsive things may later be regretted when drinking.	
13. Becoming overweight because of drinking.	
14. Waking up in an unexpected place after heavy drinking.	
15. Spending too much time drinking.	
16. Feeling badly about myself because of my drinking.	
17. Having problems created between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives because of drinking.	
18. Needing a drink after waking up (that is, before breakfast).	
19. Driving a car after drinking too much to drive safely.	
20. Neglecting obligations to family, work, or school because of drinking.	
21. Finding it difficult to limit how much one drinks.	
22. Passing out from drinking.	
23. Becoming very rude, obnoxious, or insulting after drinking.	
24. Needing larger amounts of alcohol to feel any effect, or noticing that the same amount of alcohol no longer makes one feel as drunk as it previously did.	

Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ)

Below is a list of things that sometimes happen to people either during or after they have been drinking alcohol. Next to each item below, please mark how **acceptable you think the typical male SU student** *would find each of the following: Using the following scale:*

1 – Highly Unacceptable, 2-Moderately Unacceptable, 3- Fairly Unacceptable, 4- Fairly Acceptable, 5-Moderately Acceptable, 6-Highly Acceptable

In the **past month…**	**Rating**
1. Waking up with a hangover (headache, sick stomach) the morning after drinking.	
2. Taking foolish risks when drinking.	
3. Not being able to remember large stretches of time when drinking heavily.	
4. Having the quality of work or school work suffer because of drinking.	
5. Having less energy or feeling tired because drinking.	
6. Getting into sexual situations that may later be regretted because of drinking.	
7. Ending up drinking on nights when it was previously unplanned.	
8. Having one's physical appearance harmed because of drinking.	
9. Saying or doing embarrassing things while drinking.	
10. Feeling very sick or throwing up after drinking.	
11. Not going to work or missing classes at school because of drinking, a hangover, or illness caused by drinking.	
12. Doing impulsive things may later be regretted when drinking.	
13. Becoming overweight because of drinking.	
14. Waking up in an unexpected place after heavy drinking.	
15. Spending too much time drinking.	
16. Feeling badly about myself because of my drinking.	
17. Having problems created between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives because of drinking.	
18. Needing a drink after waking up (that is, before breakfast).	
19. Driving a car after drinking too much to drive safely.	
20. Neglecting obligations to family, work, or school because of drinking.	
21. Finding it difficult to limit how much one drinks.	
22. Passing out from drinking.	
23. Becoming very rude, obnoxious, or insulting after drinking.	
24. Needing larger amounts of alcohol to feel any effect, or noticing that the same amount of alcohol no longer makes one feel as drunk as it previously did.	

IN 2

***This section asks you to estimate what drinking the <u>typical male SU student</u>** would consider acceptable versus unacceptable.

1. Consider a typical week during the **last month**. How much alcohol on average (measured in number of drinks) would you estimate is the average amount a typical male SU student would consider to be an acceptable amount of alcohol to consume on each day of a typical week?

On a typical MONDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical TUESDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical WEDNESDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical THURSDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical FRIDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SATURDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SUNDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____

2. What is the average frequency of drinking that you estimate a **typical male SU student** would consider to be acceptable.

- ❑ Never
- ❑ Less than once per month
- ❑ Once a month
- ❑ Two times a month
- ❑ Three times a month
- ❑ Once a week
- ❑ Two times a week
- ❑ Three times a week
- ❑ Four times a week
- ❑ Five times a week
- ❑ Six times a week
- ❑ Every day

3. What is the average number of drinks you think a **typical male SU student** would find acceptable to drink on a given occasion?

- ❑ 0 drinks
- ❑ 1 drink
- ❑ 2 drinks
- ❑ 3 drinks
- ❑ 4 drinks
- ❑ 6 drinks
- ❑ 7 drinks
- ❑ 8 drinks
- ❑ 9 drinks
- ❑ 10 drinks
- ❑ 11 drinks
- ❑ 12 drinks
- ❑ 13 drinks
- ❑ 14 drinks
- ❑ 15 drinks
- ❑ 16 drinks
- ❑ 17 drinks
- ❑ 18 drinks
- ❑ 19 drinks
- ❑ 20 drinks
- ❑ 21 drinks
- ❑ 22 drinks
- ❑ 23 drinks
- ❑ 24 drinks
- ❑ 25 or more drinks

❑ 5 drinks

Injunctive Norms (continued)
***This section asks you to estimate what drinking <u>YOU</u>** would consider acceptable versus unacceptable.

1. Consider a typical week during the **last month**. How much alcohol on average (measured in number of drinks) do YOU consider to be an acceptable amount of alcohol to consume on each day of a typical week?

On a typical MONDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical TUESDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical WEDNESDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical THURSDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical FRIDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SATURDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SUNDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____

2. What is the average frequency of drinking that **you** consider to be acceptable.

❑ Never
❑ Less than once per month
❑ Once a month
❑ Two times a month
❑ Three times a month
❑ Once a week
❑ Two times a week
❑ Three times a week
❑ Four times a week
❑ Five times a week
❑ Six times a week
❑ Every day

3. What is the average number of drinks that **you** consider to be acceptable to drink on a given occasion?

❑ 0 drinks
❑ 1 drink
❑ 2 drinks
❑ 6 drinks
❑ 7 drinks
❑ 8 drinks
❑ 11 drinks
❑ 12 drinks
❑ 13 drinks
❑ 16 drinks
❑ 17 drinks
❑ 18 drinks
❑ 21 drinks
❑ 22 drinks
❑ 23 drinks

- ❑ 3 drinks
- ❑ 4 drinks
- ❑ 5 drinks
- ❑ 9 drinks
- ❑ 10 drinks
- ❑ 14 drinks
- ❑ 15 drinks
- ❑ 19 drinks
- ❑ 20 drinks
- ❑ 24 drinks
- ❑ 25 or more drinks

AID

Rate your current drinking pattern.

0 – I am at my ideal

1

2

3

4

5

6

7

8

9

10 – I am extremely far from my ideal

PANAS-X Protocol Illustrating "Past Few Weeks" Time Instructions

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel **right now**.

Use the following scale to record your answers:

1	2	3	4	5
Very slightly or Not at all	A little	Moderately	Quite a Bit	Extremely

_____ cheerful	_____ sad	_____ active	_____ angry at self
_____ disgusted	_____ calm	_____ guilty	_____ enthusiastic
_____ attentive	_____ afraid	_____ joyful	_____ downhearted
_____ bashful	_____ tired	_____ nervous	_____ sheepish
_____ sluggish	_____ amazed	_____ lonely	_____ distressed
_____ daring	_____ shaky	_____ sleepy	_____ blameworthy
_____ surprised	_____ happy	_____ excited	_____ determined
_____ strong	_____ timid	_____ hostile	_____ frightened
_____ scornful	_____ alone	_____ proud	_____ astonished
_____ relaxed	_____ alert	_____ jittery	_____ interested
_____ irritable	_____ upset	_____ lively	_____ loathing
_____ delighted	_____ angry	_____ ashamed	_____ confident
_____ inspired	_____ bold	_____ at ease	_____ energetic
_____ fearless	_____ blue	_____ scared	_____ concentrating
_____ disgusted with self	_____ shy	_____ drowsy	_____ dissatisfied with self

Dissonance Thermometer

Instructions: Below are words that can describe different types of feelings. For each word, please indicate how much it describes ***how you are feeling right now*** by circling a number on the scale.

"1" means "does not apply at all" and "7" means "applies very much" to how you are feeling *right now*.

Don't spend much time thinking about each word. Just give a quick, gut-level response.

		Does Not Apply At All						Applies Very Much
1	Uncomfortable	1	2	3	4	5	6	7
2	Angry at myself	1	2	3	4	5	6	7
3	Shame	1	2	3	4	5	6	7
4	Uneasy	1	2	3	4	5	6	7
5	Friendly	1	2	3	4	5	6	7
6	Disgusted with myself	1	2	3	4	5	6	7
7	Embarrassed	1	2	3	4	5	6	7
8	Bothered	1	2	3	4	5	6	7
9	Optimistic	1	2	3	4	5	6	7
10	Annoyed at myself	1	2	3	4	5	6	7
11	Disappointed with myself	1	2	3	4	5	6	7
12	Happy	1	2	3	4	5	6	7
13	Energetic	1	2	3	4	5	6	7
14	Good	1	2	3	4	5	6	7

Campus Referrals
IN CASE OF EMERGENCY CALL 911

Psychological Services Center

804 University Ave
Second Floor
Phone: 315-443-3595
Email: mawashbu@syr.edu.

Counseling Center

Counseling Center (Walnut Place)
200 Walnut Place
Syracuse, NY 13244-2480
Phone: 315-443-4715
Fax: 315-443-4276
counselingcenter.syr.edu

Counseling Center (Options/Waverly)
111 Waverly Ave, Suite 006
Syracuse, NY 13244-2320
Phone: 315-443-4234
Fax: 315-443-7196

University Health Services

111 Waverly Avenue
Appointments 315-443-9005

Principal Investigator and Licensed Clinical Psychologist Contact Information

Stephen Maisto, PhD
samaisto@syr.edu
315-443-2334

Follow-up Survey
(Male)

Date Due:

Date Completed:

Personal Information: *Please check or fill in the answers that best describe you.*

Alcohol Use

	12 oz beer
1 standard drink =	5 oz wine
	1.5 oz shot of liquor, straight or in a mixed drink

1. Please estimate the <u>average</u> number of standard drinks you consumed on a <u>typical drinking day</u> in the past 30 days.

   _____ drinks

2. When you drink, how many hours typically elapse from the start of your first drink to the completion of your last drink?

   _____ hours

3. Think of the one day you consumed **the most** alcohol in the last month: how many standard drinks did you consume on that day?

   _____ drinks

   3a. How many days in the past month have you consumed that number of drinks?

   _____ days

4. On this heaviest drinking day, approximately how many hours passed from the beginning of the first drink to the finishing of the last?

   _____ hours

5. During the past two weeks, how many times had you consumed five or more drinks on one drinking occasion?

   _____ times

6. On how many days in the past month (i.e., the past 30 days) did you consume any amount of alcohol?

   _____ days

Alcohol Use Grid – **Typical Week**

1. Consider a typical week **during the last month**. How much alcohol on average (measured in number of drinks) do **YOU** consume on each day of a typical week?

On a typical MONDAY I consume ____ drink(s)	_____
On a typical TUESDAY I consume ____ drink(s)	_____
On a typical WEDNESDAY I consume ____ drink(s)	_____
On a typical THURSDAY I consume ____ drink(s)	_____
On a typical FRIDAY I consume ____ drink(s)	_____
On a typical SATURDAY I consume ____ drink(s)	_____
On a typical SUNDAY I consume ____ drink(s)	_____

2. What is your average frequency of drinking?

- ❑ Never
- ❑ Less than once per month
- ❑ Once a month
- ❑ Two times a month
- ❑ Three times a month
- ❑ Once a week
- ❑ Two times a week
- ❑ Three times a week
- ❑ Four times a week
- ❑ Five times a week
- ❑ Six times a week
- ❑ Every day

3. What is the average number of drinks that you drink on given occasion?

- ❑ 0 drinks
- ❑ 1 drink
- ❑ 2 drinks
- ❑ 3 drinks
- ❑ 4 drinks
- ❑ 5 drinks
- ❑ 6 drinks
- ❑ 7 drinks
- ❑ 8 drinks
- ❑ 9 drinks
- ❑ 10 drinks
- ❑ 11 drinks
- ❑ 12 drinks
- ❑ 13 drinks
- ❑ 14 drinks
- ❑ 15 drinks
- ❑ 16 drinks
- ❑ 17 drinks
- ❑ 18 drinks
- ❑ 19 drinks
- ❑ 20 drinks
- ❑ 21 drinks
- ❑ 22 drinks
- ❑ 23 drinks
- ❑ 24 drinks
- ❑ 25 or more drinks

Alcohol Use Grid – **Heavy Week**

1. Consider the week during the **last month when you drank the most alcohol**. How much alcohol (measured in number of drinks) did **YOU** consume on each day of that week?

On that MONDAY I consumed ____ drink(s)	_____
On that TUESDAY I consumed ____ drink(s)	_____
On that WEDNESDAY I consumed ____ drink(s)	_____
On that THURSDAY I consumed ____ drink(s)	_____
On that FRIDAY I consumed ____ drink(s)	_____
On that SATURDAY I consumed ____ drink(s)	_____
On that SUNDAY I consumed ____ drink(s)	_____

IN part 1
Please answer the following questions about the **typical male SU Student**

	Strong Disapproval	**Moderate Disapproval**	**Mild Disapproval**	**Mild Approval**	**Moderate Approval**	**Strong Approval**
1. How would male students at SU respond if they knew: You drank alcohol every weekend?						
2. How would male students at SU respond if they knew: You drank alcohol daily?						
3. How would male students at SU respond if they knew: You drove a car after drinking?						
4. How would male students at SU respond if they knew: You drank enough alcohol to pass out?						
5. How would male students at SU respond if they knew: You got behind in your school work because of drinking?						
6. How would male students at SU respond if they knew: You had violated the university alcohol policy once?						

	Strong Disapproval	**Moderate Disapproval**	**Mild Disapproval**	**Mild Approval**	**Moderate Approval**	**Strong Approval**
7. How would male students at SU respond if they knew: You had violated the university alcohol policy twice?						
8. How would male students at SU respond if they knew: You had a blackout (couldn't remember what you did/said) when you were drinking?						
9. How would male students at SU respond if they knew: You decided not to drink at a party?						
10. How would male students at SU respond if they knew: You alternated nonalcoholic drinks with alcoholic drinks at a party?						

DN part 1

Please answer the following questions with regard to the average male SU student

# of drinks normally consumed by *average male SU student* on **Sunday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Monday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Tuesday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Wednesday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Thursday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Friday** in last 30 days	Write in
# of drinks normally consumed by *average male SU student* on **Saturday** in last 30 days	Write in

Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ)

Below is a list of things that sometimes happen to people either during or after they have been drinking alcohol. Next to each item below, please mark an "X" in either the NO or the YES column to indicate whether or not that item describes something that has happened **To You** ***IN THE PAST ONE MONTH.***

In the **past month…**	**NO**	**YES**
1. I have had a hangover (headache, sick stomach) the morning after I had been drinking.		
2. I have taken foolish risks when I have been drinking.		
3. I've not been able to remember large stretches of time while drinking heavily.		
4. The quality of my work or school work has suffered because of my drinking.		
5. I have had less energy or felt tired because of my drinking.		
6. My drinking has gotten me into sexual situations I later regretted.		
7. I often have ended up drinking on nights when I had planned not to drink.		
8. My physical appearance has been harmed by my drinking.		
9. While drinking, I have said or done embarrassing things.		
10. I have felt very sick to my stomach or thrown up after drinking.		
11. I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.		
12. When drinking, I have done impulsive things I regretted later.		
13. I have been overweight because of drinking.		
14. I have woken up in an unexpected place after heavy drinking.		
15. I have spent too much time drinking.		
16. I have felt badly about myself because of my drinking.		
17. My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.		
18. I have felt like I needed a drink after I'd gotten up (that is, before breakfast).		
19. I have driven a car when I knew I had too much to drink to drive safely.		
20. I have neglected my obligations to family, work, or school because of drinking.		
21. I have often found it difficult to limit how much I drink.		
22. I have passed out from drinking.		
23. I have become very rude, obnoxious, or insulting after drinking.		
24. I have found that I needed larger amounts of alcohol to feel any effect, or that I could		

no longer get high or drunk on the same amount that used to get me high or drunk.		

Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ)

Below is a list of things that sometimes happen to people either during or after they have been drinking alcohol. Next to each item below, please mark **how acceptable *You*** *find each of the following: Using the following scale:*

1 – Highly Unacceptable, 2-Moderately Unacceptable, 3- Fairly Unacceptable, 4- Fairly Acceptable, 5-Moderately Acceptable, 6-Highly Acceptable

In the **past month…**	**Rating**
1. Waking up with a hangover (headache, sick stomach) the morning after drinking.	
2. Taking foolish risks when drinking.	
3. Not being able to remember large stretches of time when drinking heavily.	
4. Having the quality of work or school work suffer because of drinking.	
5. Having less energy or feeling tired because drinking.	
6. Getting into sexual situations that may later be regretted because of drinking.	
7. Ending up drinking on nights when it was previously unplanned.	
8. Having one's physical appearance harmed because of drinking.	
9. Saying or doing embarrassing things while drinking.	
10. Feeling very sick or throwing up after drinking.	
11. Not going to work or missing classes at school because of drinking, a hangover, or illness caused by drinking.	
12. Doing impulsive things may later be regretted when drinking.	
13. Becoming overweight because of drinking.	
14. Waking up in an unexpected place after heavy drinking.	
15. Spending too much time drinking.	
16. Feeling badly about myself because of my drinking.	
17. Having problems created between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives because of drinking.	
18. Needing a drink after waking up (that is, before breakfast).	
19. Driving a car after drinking too much to drive safely.	
20. Neglecting obligations to family, work, or school because of drinking.	
21. Finding it difficult to limit how much one drinks.	
22. Passing out from drinking.	
23. Becoming very rude, obnoxious, or insulting after drinking.	
24. Needing larger amounts of alcohol to feel any effect, or noticing that the same amount of alcohol no longer makes one feel as drunk as it previously did.	

Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ)

Below is a list of things that sometimes happen to people either during or after they have been drinking alcohol. Next to each item below, please mark how **acceptable you think the typical male SU student** *would find each of the following: Using the following scale:*

1 – Highly Unacceptable, 2-Moderately Unacceptable, 3- Fairly Unacceptable, 4- Fairly Acceptable, 5-Moderately Acceptable, 6-Highly Acceptable

In the **past month…**	**Rating**
1. Waking up with a hangover (headache, sick stomach) the morning after drinking.	
2. Taking foolish risks when drinking.	
3. Not being able to remember large stretches of time when drinking heavily.	
4. Having the quality of work or school work suffer because of drinking.	
5. Having less energy or feeling tired because drinking.	
6. Getting into sexual situations that may later be regretted because of drinking.	
7. Ending up drinking on nights when it was previously unplanned.	
8. Having one's physical appearance harmed because of drinking.	
9. Saying or doing embarrassing things while drinking.	
10. Feeling very sick or throwing up after drinking.	
11. Not going to work or missing classes at school because of drinking, a hangover, or illness caused by drinking.	
12. Doing impulsive things may later be regretted when drinking.	
13. Becoming overweight because of drinking.	
14. Waking up in an unexpected place after heavy drinking.	
15. Spending too much time drinking.	
16. Feeling badly about myself because of my drinking.	
17. Having problems created between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives because of drinking.	
18. Needing a drink after waking up (that is, before breakfast).	
19. Driving a car after drinking too much to drive safely.	
20. Neglecting obligations to family, work, or school because of drinking.	
21. Finding it difficult to limit how much one drinks.	
22. Passing out from drinking.	
23. Becoming very rude, obnoxious, or insulting after drinking.	
24. Needing larger amounts of alcohol to feel any effect, or noticing that the same amount of alcohol no longer makes one feel as drunk as it previously did.	

IN 2

***This section asks you to estimate what drinking the <u>typical male SU student</u>** would consider acceptable versus unacceptable.

1. Consider a typical week during the **last month**. How much alcohol on average (measured in number of drinks) would you estimate is the average amount a typical male SU student would consider to be an acceptable amount of alcohol to consume on each day of a typical week?

On a typical MONDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical TUESDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical WEDNESDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical THURSDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical FRIDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SATURDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SUNDAY a typical male SU student would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____

2. What is the average frequency of drinking that you estimate a **typical male SU student** would consider to be acceptable.

- ❑ Never
- ❑ Less than once per month
- ❑ Once a month
- ❑ Two times a month
- ❑ Three times a month
- ❑ Once a week
- ❑ Two times a week
- ❑ Three times a week
- ❑ Four times a week
- ❑ Five times a week
- ❑ Six times a week
- ❑ Every day

3. What is the average number of drinks you think a **typical male SU student** would find acceptable to drink on a given occasion?

- ❑ 0 drinks
- ❑ 1 drink
- ❑ 2 drinks
- ❑ 3 drinks
- ❑ 4 drinks
- ❑ 6 drinks
- ❑ 7 drinks
- ❑ 8 drinks
- ❑ 9 drinks
- ❑ 10 drinks
- ❑ 11 drinks
- ❑ 12 drinks
- ❑ 13 drinks
- ❑ 14 drinks
- ❑ 15 drinks
- ❑ 16 drinks
- ❑ 17 drinks
- ❑ 18 drinks
- ❑ 19 drinks
- ❑ 20 drinks
- ❑ 21 drinks
- ❑ 22 drinks
- ❑ 23 drinks
- ❑ 24 drinks
- ❑ 25 or more drinks

❑ 5 drinks

Injunctive Norms (continued)
***This section asks you to estimate what drinking <u>YOU</u>** would consider acceptable versus unacceptable.

1. Consider a typical week during the **last month**. How much alcohol on average (measured in number of drinks) do YOU consider to be an acceptable amount of alcohol to consume on each day of a typical week?

On a typical MONDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical TUESDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical WEDNESDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical THURSDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical FRIDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SATURDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____
On a typical SUNDAY **YOU** would consider ____ drink(s) to be an acceptable amount of alcohol to consume	_____

2. What is the average frequency of drinking that **you** consider to be acceptable.

❑ Never
❑ Less than once per month
❑ Once a month
❑ Two times a month
❑ Three times a month
❑ Once a week
❑ Two times a week
❑ Three times a week
❑ Four times a week
❑ Five times a week
❑ Six times a week
❑ Every day

3. What is the average number of drinks that **you** consider to be acceptable to drink on a given occasion?

❑ 0 drinks
❑ 1 drink
❑ 2 drinks
❑ 6 drinks
❑ 7 drinks
❑ 8 drinks
❑ 11 drinks
❑ 12 drinks
❑ 13 drinks
❑ 16 drinks
❑ 17 drinks
❑ 18 drinks
❑ 21 drinks
❑ 22 drinks
❑ 23 drinks

- ❑ 3 drinks
- ❑ 4 drinks
- ❑ 5 drinks
- ❑ 9 drinks
- ❑ 10 drinks
- ❑ 14 drinks
- ❑ 15 drinks
- ❑ 19 drinks
- ❑ 20 drinks
- ❑ 24 drinks
- ❑ 25 or more drinks

AID

Rate your current drinking pattern.

0 – I am at my ideal

1

2

3

4

5

6

7

8

9

10 – I am extremely far from my ideal

PANAS-X

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way **during the past few weeks**.

Use the following scale to record your answers:

1	2	3	4	5
Very slightly or Not at all	A little	Moderately	Quite a Bit	Extremely

_____ cheerful	_____ sad	_____ active	_____ angry at self
_____ disgusted	_____ calm	_____ guilty	_____ enthusiastic
_____ attentive	_____ afraid	_____ joyful	_____ downhearted
_____ bashful	_____ tired	_____ nervous	_____ sheepish
_____ sluggish	_____ amazed	_____ lonely	_____ distressed
_____ daring	_____ shaky	_____ sleepy	_____ blameworthy
_____ surprised	_____ happy	_____ excited	_____ determined
_____ strong	_____ timid	_____ hostile	_____ frightened
_____ scornful	_____ alone	_____ proud	_____ astonished
_____ relaxed	_____ alert	_____ jittery	_____ interested
_____ irritable	_____ upset	_____ lively	_____ loathing
_____ delighted	_____ angry	_____ ashamed	_____ confident
_____ inspired	_____ bold	_____ at ease	_____ energetic
_____ fearless	_____ blue	_____ scared	_____ concentrating
_____ disgusted with self	_____ shy	_____ drowsy	_____ dissatisfied with self

Dissonance Thermometer

Instructions: Below are words that can describe different types of feelings. For each word, please indicate how much it describes ***how you are feeling right now*** by circling a number on the scale.

"1" means "does not apply at all" and "7" means "applies very much" to how you are feeling *right now*.

Don't spend much time thinking about each word. Just give a quick, gut-level response.

		Does Not Apply At All						Applies Very Much
1	Uncomfortable	1	2	3	4	5	6	7
2	Angry at myself	1	2	3	4	5	6	7
3	Shame	1	2	3	4	5	6	7
4	Uneasy	1	2	3	4	5	6	7
5	Friendly	1	2	3	4	5	6	7
6	Disgusted with myself	1	2	3	4	5	6	7
7	Embarrassed	1	2	3	4	5	6	7
8	Bothered	1	2	3	4	5	6	7
9	Optimistic	1	2	3	4	5	6	7
10	Annoyed at myself	1	2	3	4	5	6	7
11	Disappointed with myself	1	2	3	4	5	6	7
12	Happy	1	2	3	4	5	6	7
13	Energetic	1	2	3	4	5	6	7
14	Good	1	2	3	4	5	6	7

Campus Referrals
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Phone: 315-443-4715
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Syracuse, NY 13244-2320
Phone: 315-443-4234
Fax: 315-443-7196

University Health Services

111 Waverly Avenue
Appointments 315-443-9005

Principal Investigator and Licensed Clinical Psychologist Contact Information

Stephen Maisto, PhD
samaisto@syr.edu
315-443-2334

Appendix B

Personalized Feedback Form

Personalized Feedback Form

Start Time	:

Personalized Feedback for ID#

Your Drinking Patterns

According to the information you provided for the past month:

- You drank alcohol: ____times
- Average number of drinks per week: ____drinks
- Maximum number of drinks in a single day: ____drinks
- Number of drinks during the heaviest week of drinking: ____drinks

Your Drinking Compared to the Syracuse University Average

In an average week,

- You drank as much as or more than _____ % of male Syracuse University students.

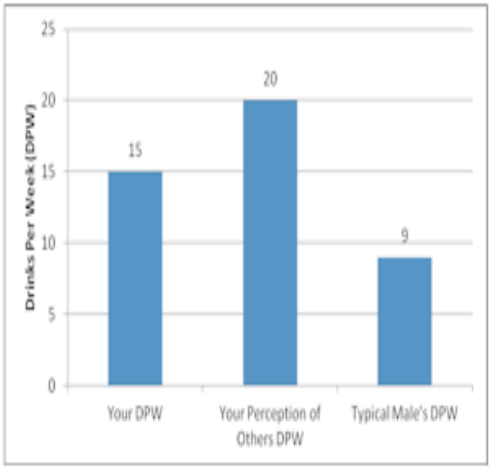
Heavier Drinking Days

Heavier drinking days are considered to be 5 or more drinks (sometimes reduced to 4 or more drinks for women). After many scientific studies, **this was the drinking level that showed significantly higher risk for alcohol-related negative events** such as accidents, aggressive behavior, and unprotected or unplanned sex.

- You reported _____ heavier drinking days in the last two weeks.
- You had as many or more heavier drinking days in the last two weeks than _____ % of male SU Students

Perceptions of Others Drinking

During the survey, we asked you to report what you thought the average college men drank in a typical week. The following chart compares your estimation to the actual number of drinks college men report consuming in a typical week, based on random surveys conducted in the past few years.



You overestimated the drinking of male students at Syracuse University by _____drinks per week. You are not alone. Most college students think that their classmates drink much more than they really do. However, **people who perceive the norm to be higher than it really is may end up drinking more to match an inflated perception.**

End Time	:

Start Time	:

Personalized Feedback for ID#

Your Personal Attitudes

According to the information you provided for the past month:

- The consequences **you** rated as the most acceptable were:

Driving after having too much to drink

Doing impulsive things you later regretted

- The consequences **you** rated as the most unacceptable were:

Blacking out

Gaining weight as a result of drinking

- The **typical male SU student** rated those same consequences as:

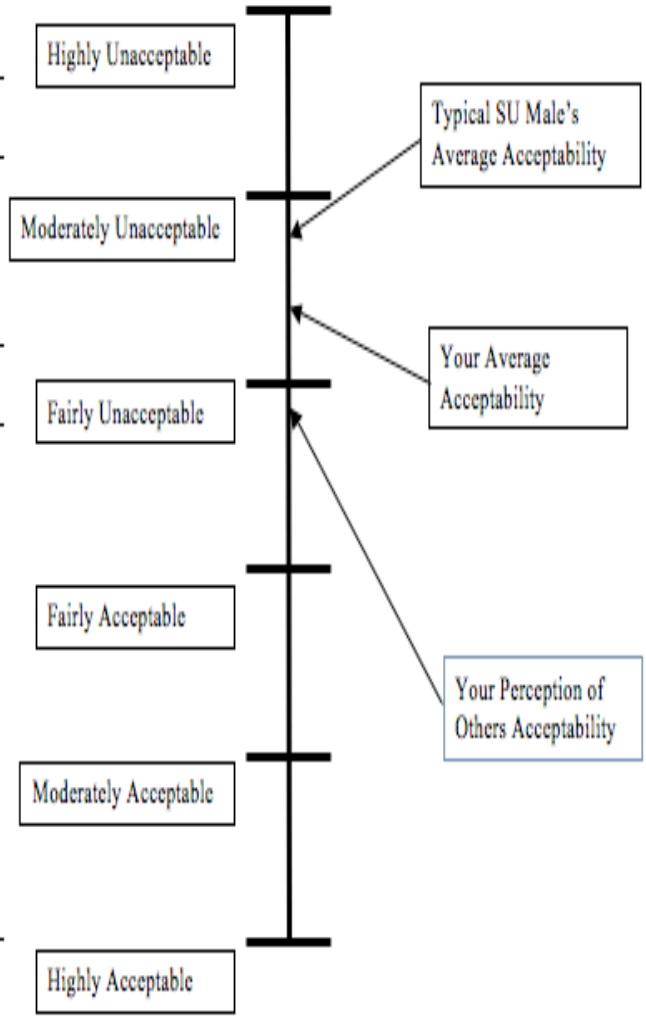
Driving after having too much to drink: **Highly Unacceptable**

Doing impulsive things you later regretted: **Somewhat Unacceptable**

Blacking out: **Highly Unacceptable**

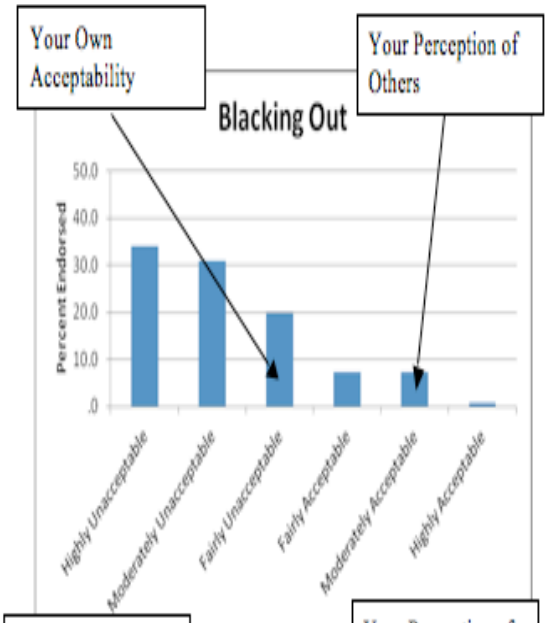
Gaining Weight as a result of drinking: **Unacceptable**

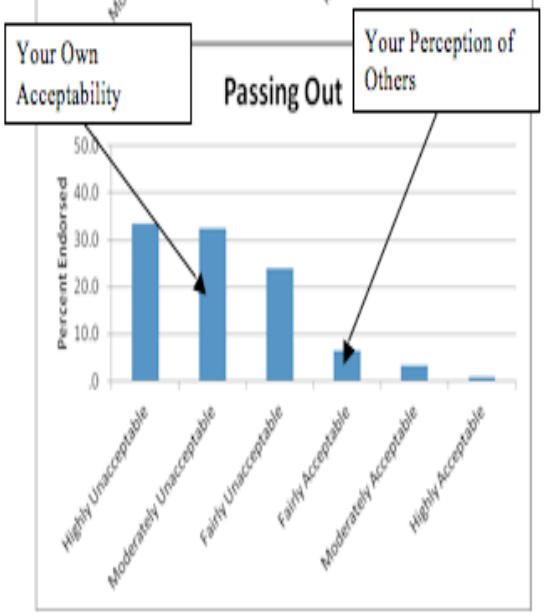
Your Acceptability of Excessive Drinking Compared to the typical male Syracuse University Average

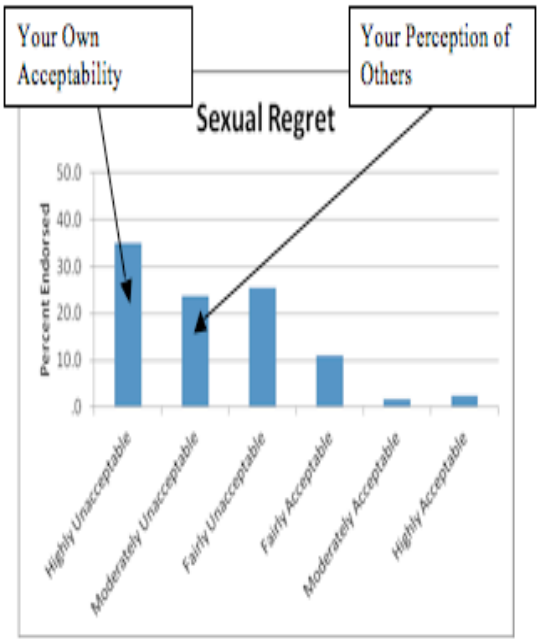


Perceptions of Others Attitudes

During the survey, we asked you to report how you thought the typical male SU Student feels about a number of alcohol related consequences. The following chart compares your estimation to the actual attitudes of reported by other male SU students.







You tended to overestimate the typical male student's acceptability of excessive drinking. You are not alone. Most college students think that their classmates are more accepting of excessive drinking than they really are. However, **people who perceive the acceptability of excessive drinking to be higher than it really is may end up having more alcohol related consequences to match an inflated perception.**

End Time ____:

Appendix C

Understanding College Drinking Intervention Manual

Understanding College Drinking

Intervention Manual

Introduction – Given to all Participants in DN, IN, and DN + IN conditions.

When the student arrives, the feedback material should be in a folder off to the side. This is done to allow initial discussion on topics other than drinking. In addition, the interviewer should seat himself or herself at an angle (not in a squared off, face-to-face position with the student). Finally, the interviewer should keep rapport upbeat and positive.

Script 1: *Thanks for choosing to take part in this project. As you might have heard already, we are entirely separate from your psychology 205 class. We are collaborating with psych 205 to try to better understand students' alcohol use. This meeting is going to focus on your personal alcohol use, your perceptions of other's use, and other's actual alcohol use.*

During the next 15 to 30 minutes, we are going to spend some time talking about your experiences with drinking, and share with you some information that other people have found helpful in making future decisions about how they relate to alcohol. We believe that more informed drinkers can make more informed choices. [pause]

Most of what we are going to talk about is based on the information <u>you</u> provided about your own alcohol use when you completed the questionnaires, and information provided by other students like you on previous surveys like the one you just filled out.

So, today we will go over that information together. Feel free to ask questions about any of the information we discuss, or anything else you'd like to know about alcohol and its effects. Some of the information I will provide you may have heard

before, but much of it may be new to you. We find that even though many college students are experienced drinkers, they don't always know all the facts about alcohol use on campus that is occurring around them.

You should know that I'm <u>not</u> going to tell you what to do about your drinking during this meeting. Instead, I will provide you some information and perhaps some suggestions for you to consider, but what <u>you decide to do with it is entirely up to you</u>. You know yourself best, and only you are responsible for the decisions you make. [pause] How does that sound to you?

Two student profiles may be encountered at this point in the session: the uninterested student or the defensive student. Each will be discussed in turn.

<u>The uninterested student.</u> This student may appear to be disinterested, just trying to get through the session by saying as little as possible. With these individuals, it is especially important to make the feedback as personalized as possible, engaging them *early* in the session. Every effort should be made to get the student to talk and to describe his/her experiences to you, even if initially they have little to do with drinking – once a person has opened up on *any* topic, s/he is more likely to engage with you on the topic at hand. Encourage the student to elaborate on short answers. Be patient and use pauses freely! Occasionally addressing his or her lack of interest may be useful: *It seems that this information doesn't really interest you very much – can you tell me about that?* Reflections

and open-ended questions are particularly important tools to draw out a reluctant participant.

Sample Script 2: *I don't want to be the only one talking during this session – that's not really the point of this meeting, and I am sure that you would find that boring! Please tell me if you have heard some of this information before, so we can focus on information that is new to you. Also, feel free to ask me any questions about alcohol you can think of – anything you might have wondered about, things you've heard from friends, and so forth. Let's try to make this session as interesting as possible for you, all right?*

The defensive student. This student may suspect that the interviewer is going to confront him/her about drinking, or label him/her as a problem drinker. As a result, the student may be very quiet, revealing very little personal information and not getting involved in the session. With this student, an empathetic and non-judgmental style is especially useful to establish a "safe" context in which personal information such as doubts and concerns about the students' drinking can be revealed. The interviewer can emphasize that there will be no attempts to label the student, and that no presumption of problems is made.

Script 3: *I'd like you to remember that I am not trying to judge or label you in any way. Instead, I'd simply like to talk with you about your relationship with alcohol during the session. If you are feeling uncomfortable at any time, let me know, okay?*

In sum, the early part of the interview establishes the working relationship of the interviewer and student. A non-judgmental manner in this stage of the interview helps to create conditions in which the student will begin to reveal information that the interviewer can refer back to throughout the rest of the feedback session.

Descriptive Norms Condition - Your Drinking Patterns

Content overview:

1. **Personal quantity/frequency**
2. **Comparison of weekly drinking to SU norms**
3. **Frequency of heavier drinking days and comparison to SU norms**

Style:

1. **Use the information provided by participant to illustrate topics**
2. **Use MI opening strategies to keep the student involved in session**
3. **Do not introduce changing personal use unless the student does first**
4. **Maintain non-judgmental stance**

Goal:

1. Provide student with an objective assessment of current alcohol use

After introducing the purpose of the whole session, it is time to present the student with the personalized feedback form (PNF). The interviewer's job is twofold: (a) to walk the student through the information he/she provided, pointing out some new concepts or insights; and (b) to enlist the student's participation in this process. Throughout the rest of the interview, the interviewer must also keep appraising the participants for defensiveness or disinterest, usually signaled by silence or loss of attention. Such signs are cues for greater use of MI "opening strategies": open-ended questions, reflections, and affirmations.

Script 3: *In order to guide our discussion today, I have prepared a personalized feedback form based on the information you provided on the online questionnaire. First we are going to discuss your drinking patterns. One way to think about your drinking is by looking at how much and how often you drink. Listed here is the information you gave us on how much and how often you drink.*

Personal Quantity/Frequency. This section provides feedback concerning self-reported drinking in the past month.

- Number of times the participant reported drinking alcohol
- The average amount per week

- Maximum consumption on one occasion (ask the student to elaborate on this event)
- The number of drinks consumed during the heaviest week of drinking

These numbers should be provided to the student one at a time. After each given piece of information, pause a bit, to allow the student time to absorb the information. It is not necessary to elicit a reaction from the student after each of the four pieces of feedback. The interviewer should look for opportunities to make reflective statements (examples: *These numbers look high to you. . .or, You sound surprised. . . or, You are not used to seeing the totals added up like this*), or ask for elaboration based on responses provided by the student (example, *How was that "too much"?)*.

Script 4: *You told us that you drank alcohol about ___ times in the past month (pause). And the number of drinks in an average week was ___*.

Let's take a look at this more closely, based on these numbers you drank ___ drinks on a typically drinking day.

(pause: if no reaction, ask *Does that make sense?* Or *Does that look right to you?*)

You also told us that the most drinks you had on a single day in the last month was ___. (pause: *do you remember that day?; Did you feel different that day? What was that day like for you?*). *And the number of drinks you had on your heaviest drinking week was ___. (pause: Was there anything in particular that happened that week?)*

After all of the drinking patterns data are provided, look for openings for reflections or elaborations if the student is reacting verbally or non-verbally. If not, a reaction can be invited, using open-ended questioning (e.g., *Now that we have summarized your drinking patterns, what are your thoughts?* Or, *How does that look to you?)*

If the student reports that the numbers accurately describe their drinking, further discussion of the student's alcohol use can be invited. You can allow some unstructured discussion led by the student if it provides you with data relevant to eliciting change talk later in the session. If the participant mentions a certain statistic, you can discuss it further. This can help foster a sense of collaboration, and an interest in the student's point of view. If the interviewer sees an opening to introduce a topic that is usually covered later within the section, s/he should feel free to cover it earlier, if at that point the student is interested and ready to hear it.

The student may refute the profile of drinking provided on the feedback form. This is understandable: because the participants rarely count his/her drinks on a weekly basis, the figures may be accurate but appear quite high. However, instead of challenging the student or implying that he or she provided inaccurate information, the interviewer can discuss the novelty of thinking about one's drinking in a reflective manner, as follows:

Script 6: *So it appears that these numbers look high to you. It may be the case that you have never thought of your alcohol use in terms of drinks per week and so forth. Most people don't think of their drinking as a weekly or monthly total. Instead, they tend to count their drinks over the course of a single evening. As a result, adding up the drinks over a number of occasions can be surprising.*

If the student still objects to the figures, the interviewer can confirm if the weekly totals are correct by determining whether the reported amounts consumed on each occasion is accurate. This can be done non-judgmentally: the goal is to re-create the totals, not prove the student wrong. Maintain a collaborative stance and adopt an air of puzzlement and eagerness to get the correct figures (*Let's go over this to make sure it is accurate*). Roll with the resistance and re-create the figures on the feedback form in a step-by-step fashion (but provide statistics on both estimates!); this may reduce initial skepticism.

Script 7: *So, you agree with the fact that you go out three times a week and average about eight drinks per occasion. Multiplying these two items together, drinking occasions times drinks per occasion, results in the figure on the feedback form: 24 drinks. However, it still seems that 24 drinks per week is high to you.*

It is possible that this may be an intentional underestimation on the participant's part in order to downplay his/her drinking. If the interviewer suspects this is the case (based on what the participant has said earlier in the interview about their alcohol use), major discrepancies should be observed neutrally, perhaps using double-sided reflections (e.g., the participant reported drinking 4 times week/7 drinks per occasion on the self-report questionnaire, but now insists

that he/she actually drinks once a week/2 drinks per occasion). However, the interviewer should be aware that it is not essential to have the student admit that they drink any given amount, especially in the initial phase of the session.

It is possible that the information on the feedback form is incorrect, or that it is not representative of typical drinking for some reason. If this occurs, the interviewer can ask if there are any particular reasons why these numbers are elevated. The student may provide a valid explanation for the elevated drinking rates ("I partied a lot during the month you asked about"; "The month you asked about was over the holidays"; "I drink more during the early part of the semester, before I have too much work"). If this occurs, the interviewer can ask them how many months are like this out of the year. If the student claims that the only time he or she drank in this way was during the month assessed, the interviewer could observe that this did indeed occur and elicit the student's response to it (*So, it appears that you only drink this way one month out of the year, but that this amount appears very high to you. What is special or unusual about this month that causes you to drink in a way you seem to feel is heavier than normal?*)

If the figures in the feedback form are incorrect, the interviewer can openly write down any changes on the feedback form that the individual indicates; this is consistent with rolling with the resistance. It is early in the session, and there is no need to damage the collaboration and rapport that the interviewer has been working to establish. Forcing the student to accept the drinking amounts on the feedback form could result in resistance and hostility during the rest of the

session. Simply calculate new totals and present feedback FOR BOTH ESTIMATES. The interviewer should assume that the student is aware of how much he/she actually drinks, even if not admitting it in the context of the session. The student will know what information applies to him or her. Much of the information on the feedback form will be a reflection of the initial drinking. Although the initial amount may have been adjusted, it may be useful for the interviewer to present the statistics related to this amount in case it is more accurate than the participant admits. (*Although you said this was a heavy month of drinking for you… This amount of drinking led to...*)

Script 8: *Now we can compare how much you drink in relation to other male/female SU students. There was a major research project performed a couple of years ago in which they interviewed approximately 2,000 students SU on their alcohol and drug use. The students completed anonymous forms during the data collection. From these data, the researchers were able to create a table of percentiles that show how much the typical student drank per week*. [note this refers to Appendix A, which can be shown to the student if s/he asks]

As we just discussed, you reported that you drink __ drinks per week. Based on this total, you are drinking more than about xx% of college men/women at SU. In other words, compared to these 2,000 students polled, __ percent drink less than you do, and __ percent drink more. *[pause for a response; if none is forthcoming, you can fish:* How does this look to you?; How does that feel to you? Where would you have placed yourself?]”

Often, the student is surprised or unsure about the percentile rank; if it seems that the student doesn't get it, or could use some time for it to sink in, try the following.

Script 9: *Another way to look at percentile ranks is to think of it as a line of students. If I went out and grabbed 99 other students off the street and put them with you in a line, from the lightest drinker to the heaviest drinker, you would be the 97th person in that line. That means that [3] people would drink more than you. However, if you turned around, you would see [96] people that drink less than you do.*

Some students find that this frame is not consistent with their experience. The Syracuse University drinking environment is frequently cited: "These can't apply to SU, because everyone drinks here"; "A lot of my friends drink more than me". Such a response provides an opportunity to introduce the concept of subgroup norms (e.g., from the Perceptions section).

Students may also try to discredit the percentiles derived from the survey in a number of ways: Therefore, the interviewer should be familiar with the research and well prepared to answer questions about the source of the percentiles.

Q: I bet that people underestimated or lied about their use on the survey so they wouldn't get in trouble.

A: *It was anonymous, and research has shown that when people are given guarantees that their answers are confidential or anonymous, they report accurately*.

Some students may continue to resist categorizing themselves with the Syracuse University Norms due to the fact that it includes <u>all</u> students, not just the drinkers. For that reason, a third set of percentiles is included, which places the student among only those students at SU who drink. As a general rule, the SU percentiles change very little when eliminating the nondrinkers from the percentile calculations.

Some students will express surprise and/or dismay at high percentile rankings. Others will not be surprised at all, and will assert that the information makes sense given their experience. A useful reflective response can be *"So you are already aware that you are in the top half (or third / quarter / 10%) of drinkers on campus,"* and this may elicit self-perceptions of how they compare to others. Where might you have placed yourself on the continuum?

<u>Frequency of Heavier Drinking</u>. The term "heavier drinking days" is used in the PNF instead of binge drinking to avoid potentially distracting discussions about what binge means. However, the interventionist can feel free to respond affirmatively to students'

queries whether this is what is meant by binge drinking, and state that we avoid this term because the term binge has also been used to denote longer and more intense stretches of drinking.

Script 10: Another way to look at drinking patterns is to look at heavier drinking days. *The next section addresses heavier drinking days. Heavier drinking has been defined in many different ways, but in this context, it means consuming 5 or more drinks during one drinking occasion (four or more drinks for women). This amount of drinking is often associated with an increased risk of experiencing a number of negative things, such as small things like hangovers to more serious things like getting into arguments or fights, personal injuries and car crashes. [pause]*
Based on the information you provided you had X heavier drinking days in the last month. Comparing that to other SU students, that puts you at the xxth percentile, or more than xx% of other female/male SU students.

Often, the student may have comments or questions about heavier drinking:

- The cutoff is rather low ("Five beers isn't a lot in the course of an evening") → sample response: *Five beers seems like not much alcohol to you.*

- Attempts to discredit the definition by constructing relatively low risk scenarios ("Is it heavier drinking if a 300 pound guy has 5 beers over the course of seven hours?") → sample response: *Of course, standard*

definitions don't apply to all situations, but most college students do their drinking over 2-3 hours. But you make a very good point and we'll be talking about how a person's size and how long a person is drinking makes a difference in how intoxicated they get.

The association of heavier drinking days with binge drinking may be raised by students so care must be taken here by the interviewer not to get into the position of defending the term binge drinking. Acknowledging connotations of binge drinking (as appropriate) is acceptable but quickly referring back to heavier drinking days as a better term is suggested. Counting heavier drinking days is just another way to assess one's drinking, and this cutoff is associated empirically with an increased risk of adverse consequences (for most students).

Script 11: *So it sounds like 5 drinks over the course of an evening doesn't sound like a lot to you. However, that amount has been repeatedly shown to be associated with an increased risk of negative consequences. Does this apply to you? – maybe, maybe not. As we will soon discuss, there are several different factors that determine how drunk someone gets.*

If the participant has already mentioned some negative consequences of drinking (such as throwing up, getting into fights, etc.) and accepts the cutoff for heavier drinking days, these events can be described as more likely to occur

when they have exceeded the heavy drinking cutoff: *So, the take home point is that when you consume 5 or more drinks on one occasion, you are more likely to get into fights and throw up, much like the times you were telling me about.*

Perceptions of Alcohol Use

Content:

1. **Perceived drinking norms of Syracuse University students**
2. **Comparison to local drinking norms**

Style:

1. **Maintain non-judgmental approach**
2. **Avoid making assumptions about friends of participant when discussing norms and situations that influence drinking**
3. **Use information participant provided earlier in session to illustrate topics**

Goals:

1. **Help students be more aware of how social context influences alcohol use**
2. **Help students appreciate that lower drinking is the norm**

In this section, perceived drinking norms are discussed in order to (a) establish the student's misperceptions (if they are reflected in a discrepancy between estimated and

real norms) and (b) elicit the student's thoughts on why that may have occurred. The interviewer should provide a definition, assuming that the participant does not know what drinking norms are:

Script 12: *This section addresses your perceptions of the drinking around you. These are often called perceived drinking norms. These are simply your perceptions of the drinking of others. Based on their observation of others' behaviors, people get an idea of what activities are accepted, and normal – hence the term 'norms'.*

Once the definition has been provided, draw the student's attention to the table containing drinking norms. Although the participant's reaction to the percentile comparisons with local norms may have already provided an opportunity to introduce the effect of drinking norms, the table of norms on the PNF can be used as a specific example of this mechanism at work. The interviewer can introduce the estimate of the typical college student's drinking as follows:

Script 13: *Back on the assessment forms you filled out, you estimated the amount the typical college student drank -- as if you and I went out and grabbed a student on the street and asked him(her) how much (s)he drank during the week. You estimated that the typical male/female SU student drank _____ drink(s) per week. Now, this estimate can be compared to the actual drinking on campus based survey research. Sometimes*

people overestimate what their peers drink. . . In your case, you overestimated by x drinks per week. What went into this estimate? What might be going on?

The amount of overestimation can be discussed, and the student's reactions to the information should be invited. If the student is disbelieving of the actual norms that are presented on the norms table, the interviewer can mention one or both of the common reasons for misperceptions. First is the influence of selective exposure to heavier drinkers (heavier drinkers socialize with other heavier drinkers), and this biased sample can produce inflated norms. Many people who usually drink when they socialize don't expose themselves to all the people who are doing other things for fun. Second, if the disbelief comes from the assertion that, "Everyone I know drinks more than that," it is also possible that this is a misperception due to common assumptions people make. The following could be useful:

Script 14: *You mentioned that <u>your</u> friends drink as much as/more than you do. However, I wonder if you ever actually counted the number of drinks they have over the course of an evening, or is this more of an estimate? [pause] It may be the case that your estimate of other's drinking is exaggerated. There are a number of reasons why people assume that others drink more or are drunker than may actually be the case. Some people brag about drinking more than they actually have, and tell a lot of drinking stories; those stories stand out in our memory [saliency heuristic]. Also if you see people only in drinking situations, you can conclude that they are heavier drinkers than*

they actually are [representativeness heuristic]. Whatever the cause of these elevated norms, you may be drinking to match a level of drinking that is, in reality, lower than you think.

A minority of students estimate the SU norm fairly accurately or even underestimate it. In these cases, it may be helpful for the interventionist to draw a line on the bar representing the median if it will normalize the student's lower estimate. Explain how the means can be drawn upward with a few very heavy drinkers, but that the median represents the midpoint of the distribution.

Identifying the actual norms provides a segue to connect personal drinks per week (presented in the first section of the PNF) to perceived norms and actual norms for drinks per week: *Let us compare these estimates to your own numbers. . .*

(a) If <u>personal use is less than the guesstimates of other students</u> (use judgment - if the student is a confirmed low risk drinker or a moderate drinker who is already exhibiting change talk – this section can be skipped), the interventionist can mention that the environment the student is currently in may be conducive to the development and maintenance of heavy drinking. "*When a person thinks others are drinking much more than s/he does, and feels that level of drinking is 'normal', it can sometimes pull a person's drinking upwards, or at least make it easier to slide into heavier drinking patterns."* This type of discrepancy is an example of drinking norms at work -- the

participant is surrounded by drinking that is above average, and as a result may come to see that drinking behavior as normal - hence the word "norms". Mention the importance of knowing the “real” norms as a basis for comparison.

(b) If personal use is the same or higher than that of others, then the interviewer may find it useful to reflect upon this: *So it seems that you regularly drink more than you estimate others drink. . .What can you tell me about that?* This may help to enhance the participant's sense of discrepancy.

The interviewer should try to help the student understand (a) why these misperceptions occur, and (b) the influence they can have on personal alcohol use. To this end, personal information can also be incorporated into the discussion of drinking norms. By this point in the session, the student has most likely provided information regarding his or her drinking environment, often when discussing the national drinking percentages. Students are often surprised by their percentile rank, and will frequently justify it by describing the drinking that surrounds them ("All of my friends drink"; "Everyone drinks on campus"; "A lot of my friends drink more than I do") Revisiting such information when discussing drinking norms can make the concept more relevant:

Script 15: *In general, people who tend to socialize with others who drink heavily, or more than then actual average, tend to overestimate what the typical amount of drinking is on campus. In your case, you mentioned that* [insert their comment*, e.g., most of your friends drink as much or more than you do*]*. It is possible that your friends really*

are heavy drinkers. When we are surrounded by individuals behaving in a certain way it can lead to misperceptions of what is actually typical behavior. In this case, if heavy drinkers surround you, then you might assume that the amount of drinking observed is typical. That's understandable. In reality, this drinking could be quite excessive when compared to campus averages. You may be surprised to hear that 19-20% of college students do not drink at all (Wechsler et al., 2002). This is an example of how perceived norms can be higher than the actual norm. . . . [pause for comments from participant.]

What you perceive to be the norm can be important if your behavior is influenced by your perceptions of what others are doing; if the norm is inflated/exaggerated then your drinking may be drawn upward to it.

When discussing norms, the interviewer can point out that although perceptions of drinking norms influence most students, the individual does have control over his or her actions. Knowing the real norm may help a person to remain in his/her comfort zone. In addition, because these influences are stronger in some situations than others, people react in different ways to the drinking norms that surround them. Finally, invite comments or questions about the perceived norms section: *Does all this make sense to you so far?*

It may be helpful for the interviewer to go into more detail on the potential effects of an elevation of the perception of other's drinking. Research indicates that heavy drinkers

tend to overestimate the amount of alcohol use occurring around them (Baer et al., 1991), the number of alcohol-related consequences that others experience (Baer & Carney, 1993), and how accepting others are about heavy drinking and related problems (Perkins & Berkowitz, 1986; Semenec & Carey, 2000). As a result, the student's choices may be influenced by exaggerated norms. Because perceived norms are highly related to actual behavior, misperceived norms may serve to promote high levels of drinking. Research conducted at SU has shown that the larger the self-other differences in perceived drinking norms, the more likely a student is to increase drinking over time (Carey, Borsari, Carey, & Maisto, 2006).

Injunctive Norms Condition – Your Personal Attitudes

Content overview:

1. **Personal Attitudes about excessive drinking**
2. **Comparison of personal attitudes to SU norms**

Style:

1. **Use the information provided by participant to illustrate topics**
2. **Use MI opening strategies to keep the student involved in session**
3. **Do not introduce changing personal use unless the student does first**
4. **Maintain non-judgmental stance**

Goal:

1. **Provide student with an objective assessment of current attitudes towards excessive drinking**

After introducing the purpose of the whole session, it is time to present the student with the personalized feedback form (PNF). The interviewer's job is twofold: (a) to walk the student through the information he/she provided, pointing out some new concepts or insights; and (b) to enlist the student's participation in this process. Throughout the rest of the interview, the interviewer must also keep appraising the participants for defensiveness or disinterest, usually signaled by silence or loss of attention. Such signs are cues for greater use of MI "opening strategies": open-ended questions, reflections, and affirmations.

Script 16: *In order to guide our discussion today, I have prepared a personalized feedback form based on the information you provided on the online questionnaire. First we are going to discuss your personal attitudes towards excessive drinking. One way to think about your drinking is to look at the behaviors or consequences that you rated as the most unacceptable. Listed here are the alcohol related consequences you rated as highly unacceptable.*

Personal Attitudes Towards Excessive Drinking. This section provides feedback concerning self-reported attitudes about excessive drinking.

- List of the consequences the participant rated as highly (un)acceptable
- The typical male/female's ratings of those same items
- The participants average acceptability of excessive drinking compared to the typical male/female SU Average

These pieces of information should be provided to the student one at a time. After each given piece of information, pause a bit, to allow the student time to absorb the information. It is not necessary to elicit a reaction from the student after each piece of feedback. The interviewer should look for opportunities to make reflective statements (examples: You're surprised that even though you found driving under the influence to be highly acceptable, most college students find it to be highly unacceptable… or It's surprising that even though you find a number of these consequences to be somewhat acceptable, most students at SU find them to be unacceptable, or ask for elaboration based on responses provided by the student.

Script 17: *You told us that you found ____, ____ to be acceptable consequences of drinking alcohol.* (Pause). Reflect reaction.

Let's take a look at this more closely. Tell me about your thought process when rating these consequences.

After all of the consequences rated by the participant to be acceptable are discussed, look for openings for reflections or elaborations if the student is reacting verbally or non-verbally. If not, a reaction can be invited, using open-ended questioning (e.g., *Now that we have summarized your attitudes, what are your thoughts?* Or, *How does that look to you?)*

You told us that you found ____, ____ to be unacceptable consequences of drinking alcohol. (Pause). Reflect reaction.

Let's take a look at this more closely, tell me about your thought process when rating these consequences.

After all of the consequences rated by the participant to be unacceptable are discussed, look for openings for reflections or elaborations if the student is reacting verbally or non-verbally. If not, a reaction can be invited, using open-ended questioning (e.g., *Now that we have summarized your attitudes, what are your thoughts?* Or, *How does that look to you?)*

Script 18: *Tell me about the difference between the items you rated as acceptable and the items you rated as unacceptable.*

If the student reports that these ratings represent his or her true attitudes, further discussion of the student's alcohol use can be invited. You can allow some unstructured discussion led by the student if it provides you with data relevant to eliciting change talk later in the session. If the participant mentions a certain consequence as particularly unacceptable, you can discuss it further. This can help foster a sense of collaboration, and an interest in the student's point of view. If the interviewer sees an opening to introduce a topic that is usually covered later within the section, s/he should feel free to cover it earlier, if at that point the student is interested and ready to hear it.

The student may refute the attitudes provided on the feedback form. This is understandable because the participants rarely consider their attitudes in concert and/or the attitudes may be accurate but appear surprising because they have not examined them before. However, instead of challenging the student or implying that he or she provided inaccurate information, the interviewer can discuss the novelty of thinking about one's drinking in a reflective manner, as follows:

Script 19: *So it appears that these attitudes seem extreme to you. It may be the case that you have never thought of your attitudes about excessive alcohol use altogether before. Most people don't think about their attitudes toward a number of alcohol related consequences at the same time. Instead, they tend to react to consequences one at a time as they are faced with them. As a result, reviewing a number of your attitudes altogether can be surprising.*

It is possible that the information on the feedback form is incorrect, or that it is not representative of the student's true attitudes for some reason. If this occurs, the interviewer can ask if there are any particular reasons why these attitudes are incorrect. The student may provide a valid explanation for the inaccurate attitudes ("I thought that I was suppose to say that all of these things were bad, but now that I see that you aren't judging me, I can tell you that I actually don't find a lot of these consequences to be that bad.). If this occurs, the interviewer can ask them to give their true attitudes towards the consequences listed, and the interviewer can openly write down any changes on the feedback form that the individual indicates; this is consistent with rolling with the resistance. It is early in the session, and there is no need to damage the collaboration and rapport that the interviewer has been working to establish. Forcing the student to accept the attitudes on the feedback form could result in resistance and hostility during the rest of the session.

Simply cross-out the attitudes on the PNF and write the true attitudes in their place. The interviewer should assume that the student is aware of his or her attitudes toward excessive drinking, even if not admitting it in the context of the session. The student will know what information applies to him or her.

Script 20: *Now we can compare your overall average acceptability of all of the alcohol related consequences you were presented with in relation to other male/female SU students' average ratings of these same consequences. There was a research project performed a couple of years ago, in which they interviewed students SU on their attitudes about excessive alcohol and drug use. The students completed anonymous forms during the data collection. From these data, the researchers were able to calculate the average acceptability ratings of all the alcohol related consequences on the survey.*

Direct the student's attention to the figure.

Script 21: *This table contains three pieces of information. The first column represents your average acceptability of excessive drinking, the second column represents your perception of the typical male/female SU student's average acceptability of excessive drinking, and the third column represents the actual attitudes of other SU students' average ratings of excessive drinking.*

You reported that you find excessive drinking to be _____ drink(s) on average.

You reported that you thought the typical male/female SU student would find excessive drinking to be _____ drink(s) on average.

In reality, the typical male/female SU student actually reported excessive drinking to be _____ drink(s) on average.

The typical results will be that students will believe that they are personally less permissive of excessive drinking then their peers and believe that their peers are more permissive of excessive drinking then they actually are (Schroeder and Prentice, 1998).

Script 22: *Based on this figure it is clear that you believed that other students found excessive drinking to be more acceptable than you personally find it, and that you believed that other students would be more accepting of excessive drinking then they actually are. [Pause for a response; if none is forthcoming, you can fish:* How does this look to you?; How does that feel to you? What do you make of this?]"

Often, the student is surprised or unsure about the figure; if it seems that the student doesn't get it, or could use some time for it to sink in, try the following.

Script 23: *Another way to look at this is that in reality other students agree with you that excessive drinking is unacceptable. Even though it might seem like other students approve of excessive drinking, in reality they agree that drinking to excess is unacceptable.*

Some students find that this frame is not consistent with their experience. The Syracuse University drinking environment is frequently cited: "These can't apply to SU, because everyone drinks here, and most drinkers have consequences that result from their drinking"; "A lot of my friends experience these things". Such a response provides an opportunity to introduce the concept of subgroup norms (e.g., from the Perceptions section).

Students may also try to discredit the percentiles derived from the survey in a number of ways. Therefore, the interviewer should be familiar with the research and well prepared to answer questions about the source of the percentiles.

Q: I bet that people lied about their opinion of excessive drinking on the survey so they wouldn't get in trouble.

A: *It was anonymous, and research has shown that when people are given guarantees that their answers are confidential or anonymous, they report accurately*.

Perceptions of others attitudes. The three items with the biggest discrepancy between personal and perceived attitudes will be selected for the next section of the PNF. Take a moment to orient the student to this page of the PNF so that he or she is not distracted trying to decipher it on his or her own.

Script 24: *Another way to look at attitudes about excessive drinking is to compare your personal attitudes, your perception of others' attitudes, and others' actual attitudes on specific alcohol related consequences. On this page there are three pie graphs. The pie graphs represent the typical male/female SU student's actual attitudes about specific alcohol related consequences based on the survey I told you about earlier. In these charts, a bigger section (i.e., piece of the pie) means that more students gave that response. For example, if we look at the pie chart for blackouts, we can see that most students rated blacking out as either highly unacceptable or somewhat unacceptable, whereas, very few students found blacking out to be acceptable in any way. On each of these pie charts are arrows that indicate your personal ratings of the acceptability of each specific alcohol related consequence and your belief about how others would rate the acceptability of this same consequence. Do you have any questions about how these charts are setup?*

Often, the student may have comments or questions about the charts:

- This small section means that almost no one finds blacking out to be acceptable? → sample response: *It's surprising that so few people find blacking out to be acceptable.*

Script 25: *This section addresses your perceptions of the drinking around you. These are often called perceived drinking norms. These are simply your perceptions of the drinking of others. Based on their observation of others behaviors, people get an idea of what activities are accepted, and normal – hence the term 'norms'.*

Once the definition has been provided, draw the student's attention to each of the pie charts on the PNF. The interviewer can introduce the estimate of the typical college student's attitudes as follows:

Script 26: *Back on the assessment forms you filled out, you estimated the typical male/female SU student's attitudes about blacking out to be unacceptable, and you personally rated blacking out to be somewhat unacceptable. In reality most students find blacking out to be highly unacceptable. Sometimes people overestimate their peers acceptability of alcohol related consequences. . . In your case, you overestimated by 2 points on the scale or in other words you thought that your peers found blacking out to be unacceptable, but in reality they find blacking out to be highly unacceptable. What went into this estimate? What might be going on?*

Repeat this script for the other two pie charts.

The amount of overestimation can be discussed, and the student's reactions to the information should be invited. If the student is disbelieving of the actual norms that are presented on the norms table, the interviewer can mention one or both of the common reasons for misperceptions. First is the influence of selective exposure to heavier drinkers (heavier drinkers socialize with other heavier drinkers, and heavy drinkers tend to minimize alcohol related consequences), and this biased sample can

produce inflated norms. Many people who usually drink when they socialize don't expose themselves to all the people who are doing other things for fun. Second, if the disbelief comes from the assertion that, "Everyone I know thinks blacking out is cool," it is also possible that this is a misperception due to common assumptions people make. The following could be useful:

Script 27: *You mentioned that <u>your</u> friends think that blacking out is cool. However, I wonder if you ever actually talked to them one-on-one about their attitudes about blacking out? [Pause]. It may be the case that your estimate of other's attitudes is exaggerated. There are a number of reasons why people assume that others are more accepting of excessive drinking, like blacking out. Some people brag about getting so drunk they black out or pass out because they want to make light of it, or are secretly embarrassed about it. Also if you see people only in drinking situations, or talk about these things only in groups you can conclude that they are actually more accepting of these consequences then they actually are. Whatever the cause of these elevated norms, you may end up minimizing the detrimental effects of these consequences or falsely believing that your friends think you're cool when you do something harmful when drinking, when in reality students overwhelmingly agree that excessive drinking is unacceptable.*

A minority of students estimate the SU norm fairly accurately, or even underestimate it. In these cases, it may be helpful for the interventionist to praise

the student's conservative beliefs or accurate perceptions. The interventionist could say something like… *Most students overestimate how accepting of excessive drinking their peers are. How did you know that in reality most students don't approve of excessive drinking? What have you observed or heard among your friends that let you know that they do not approve of these types of alcohol related consequences?*

Identifying the actual norms provides a segue to connect personal attitudes (presented in the first section of the PNF) to perceived attitudes and actual attitudes

(a) If personal attitudes are less than the guesstimates of other students (use judgment - if the student is a confirmed low risk drinker or a moderate drinker who is already exhibiting change talk – this section can be skipped), the interventionist can mention that the environment the student is currently in may be conducive to the development and maintenance of excessive drinking. "*When a person thinks others are more accepting of excessive drinking then they actually are, and feels that excessive drinking and experiencing alcohol related consequences is 'normal', it can sometimes create a false impression that experiencing alcohol related consequences yourself is acceptable."*

This type of discrepancy is an example of drinking norms at work -- the participant is surrounded by drinking that is above average, and as a result may come to believe that excessive drinking is normal - hence the word "norms". Mention the importance of knowing the "real" norms as a basis for comparison.

(b) If personal attitudes are the same or higher than that of others, then the interviewer may find it useful to reflect upon this: *So it seems that you believe that you are more accepting of alcohol related consequences than your peers… What can you tell me about that?* This may help to enhance the participant's sense of discrepancy.

The interviewer should try to help the student understand (a) why these misperceptions occur, and (b) the influence they can have on personal alcohol use. To this end, personal information can also be incorporated into the discussion of normal attitudes about excessive drinking. By this point in the session, the student has most likely provided information regarding his or her drinking environment. Students are often surprised by the difference between their perception of others' attitudes and others' actual attitudes. Revisiting such information when discussing drinking norms can make the concept more relevant:

Script 28: *In general, people who tend to socialize with others who drink heavily, or appear to approve of excessive drinking, tend to overestimate what the typical attitude toward excessive drinking is on campus. In your case, you mentioned that* [insert their comment*, e.g., most of your friends think passing out is funny*]*. It is possible that your friends really do find passing out to be funny. When we are surrounded by individuals behaving in a certain way it can lead to misperceptions of what is actually a typical attitude about drinking. In this case, if people who approve of excessive drinking surround you, then you might assume that that attitude is typical. That's*

understandable. In reality, this attitude could be different than the campus averages. You may be surprised to hear that many college students find any alcohol related consequences to be highly unacceptable. This is an example of how perceived norms can be higher than the actual norm. . . . [Pause for comments from participant.] ***What you perceive to be the norm can be important if your behavior is influenced by your perceptions of what others are doing; if the norm is inflated/exaggerated then your drinking may be drawn upward to it.***

When discussing norms, the interviewer can point out that although perceptions of drinking norms influence most students, the individual does have control over his or her actions. Knowing the real norm may help a person to remain in his/her comfort zone. In addition, because these influences are stronger in some situations than others, people react in different ways to the drinking norms that surround them. Finally, invite comments or questions about the perceived norms section: *Does all this make sense to you so far?*

It may be helpful for the interviewer to go into more detail on the potential effects of an elevation of the perception of other's drinking. Research indicates that heavy drinkers tend to overestimate the amount of alcohol use occurring around them (Baer et al., 1991), the number of alcohol-related consequences that others experience (Baer & Carney, 1993), and how accepting others are about heavy drinking and related problems (Perkins & Berkowitz, 1986; Semenec & Carey, 2000). As a result, the

student's choices may be influenced by exaggerated norms. Because perceived norms are highly related to actual behavior, misperceived norms may serve to promote high levels of drinking. Research conducted at SU has shown that the larger the self-other differences in perceived drinking norms, the more likely a student is to increase drinking over time (Carey, Borsari, Carey, & Maisto, 2006).

Conclusion of Session – Given to all participants in the DN, IN, and DN + IN Conditions

The brief intervention should be concluded as follows.

Script 29: *OK. That concludes the material I have to share with you. Remember that I said at the start that what you do with the information discussed today is totally up to you.*

In rare cases, a student will bring up issues that you feel deserve additional attention by a professional counselor. You should be prepared to offer a copy of the referral sheet given out at baseline, presented as if it were standard procedure, with a suggestion such as the following:

Script 30: *Based on what you have shared with me about _____, you might find it helpful to talk to someone at* [fill in: the Counseling Center, the Psychological Services Center]. *Here is the number*.

At your discretion, you can offer any of the following to reduce barriers to seeking help and to set up positive expectancies:

• *you don't have to make a big commitment, you can just go and talk to a knowledgeable person once to see if it would be helpful to you*

• *these places are staffed with people who can help you sort out your feelings on this issue*

• *you are not alone in dealing with something like this, and talking with a counselor can help*

Script 31: *Now that we have gone over everything I had prepared for you, I wonder what impressions you've had of this session? What has it been like for you to talk about your drinking today?*

Now there are some organizational tasks to complete before you let the participant go. The interviewer administers the client satisfactions questions as follows.

Script 32: *Feel free to keep the PNF. The last thing I'll ask you to do today is to fill out a few feedback forms as a part of a brief survey. Your feedback about this session really is important, and we do make improvements based on what students tell us! I am going to give you some privacy, because you will have a chance to evaluate me as well as the session itself. When you finish these forms, I can make your next appointment for you. Any questions at this point?*

Finally, after the student completes the post-intervention survey, the interviewer signs the student up for a 1 month follow-up assessment.

Descriptive Norms Tables
Alcohol

Average Drinks Per Week (DPW) Over the Past 30 Days

Definition: Score is the number of reported drinks in a typical week, using a single item

N = 1868

Sample:
Mean: 6.45
SD: 8.54
Median: 4
Range: 0-90

Males:
N: 755
Mean: 8.78
SD: 10.82
Median: 5
Range: 0-90

Females:
N: 1111
Mean: 4.87
SD: 6.08
Median: 3
Range: 0-55

DPW Sample	Sample %	DPW Male	Male %	DPW Female	Female %
0	25.1	0	23	0	26.5
1	34.8	1	31.1	1	37.3
2	43.0	2	37.1	2	47
3	48.9	3	41.5	3	54
4	54.6	4	46.1	4	60.4
5	61.6	5	52.8	5	67.6
6	66.3	6	57.2	6	72.5
7	69.5	7	59.5	7	76.3
8	74.0	8	63.3	8	81.3
9	74.7	9	64.1	9	81.9
10	82.1	10	71.9	10	89
11	82.2	12	74.7	11	89.2
12	84.7	13	74.8	12	91.4
13	84.9	14	75.5	13	91.6
14	85.2	15	80.9	14	91.8
15	89.0	16	82	15	94.4
16	89.6	17	82.3	16	94.8
17	89.8	18	83	17	94.9
18	90.4	20	89.1	18	95.4
20	94.4	21	89.3	20	98
21	94.5	22	89.9	21	98.1
22	94.9	23	90.1	22	98.2
23	94.9	24	90.9	24	98.4
24	95.3	25	93.6	25	98.8
25	96.7	27	93.8	28	98.9
27	96.8	29	93.9	30	99.5
28	96.8	30	96.8	35	99.7
30	98.4	35	97.9	40	99.9
35	99.0	40	98.3	55	100
40	99.3	45	99.1		
45	99.6	50	99.5		
50	99.7	60	99.6		
55	99.8	67	99.7		
60	99.8	75	99.9		
75	99.9	90	100		

Alcohol – Drinkers Only

Average Drinks Per Week (DPW) Over the Past 30 Days

Definition: Score is the number of reported drinks in a typical week, using a single item

N = 1400

Sample:
Mean: 8.61
SD: 8.22
Median: 6
Range: 1-90

Males:
N: 581
Mean: 11.41
SD: 11.05
Median: 8
Range: 1-90

Females:
N: 817
Mean: 6.62
SD: 1.29
Median: 5
Range: 1-55

DPW Sample	Sample %	DPW Male	Male %	DPW Female	Female %
1	13	1	10.5	1	14.7
2	23.9	2	18.2	2	27.9
3	31.9	3	23.9	3	37.5
4	39.4	4	29.9	4	46.1
5	48.8	5	38.7	5	55.9
6	55.1	6	44.4	6	62.7
7	59.3	7	47.3	7	67.8
8	65.3	8	52.3	8	74.5
9	66.2	9	53.4	9	75.4
10	76.1	10	63.5	10	85.1
11	76.3	12	67.1	11	85.3
12	79.6	13	67.3	12	88.4
13	79.8	14	68.2	13	88.6
14	80.3	15	75.2	14	88.9
15	85.3	16	76.6	15	92.4
16	86.1	17	76.9	16	92.9
17	86.4	18	78	17	93
18	87.2	20	85.9	18	93.8
20	92.6	21	86.1	20	97.3
21	92.7	22	86.9	21	97.4
22	93.1	23	87.1	22	97.6
23	93.2	24	88.1	24	97.8
24	93.8	25	91.7	25	98.4
25	95.6	27	91.9	28	98.5
27	95.7	29	92.1	30	99.4
28	95.8	30	95.9	35	99.6
29	95.9	35	97.2	40	99.9
30	97.9	40	97.8	55	100
35	98.6	45	98.8		
40	99	50	99.3		
45	99.4	60	99.5		
50	99.6	67	99.7		
60	99.8	75	99.8		
67	99.9	90	100		
75	99.9				
90	100				

Alcohol – Heavy Drinking Episodes

Number of Heavy Drinking Episodes (HDE) Over the Past 2 Weeks

Definition: Score is the number of reported heavy drinking days (> 5 drinks), using a single item and a likert scale

N = 1876

Sample:
Mean: 2.37
SD: 1.36
Median: 5
Range: 1-6

Males:
N: 761
Mean: 2.58
SD: 1.40
Median: 3
Range: 1-6

Females:
N: 1113
Mean: 2.23
SD: 1.31
Median: 2
Range: 1-6

HDE	Sample %	Male %	Female %
None	39.4	33.9	43.2
Once	57	49.5	62.1
Twice	73.1	67.4	77
3-5 times	94.6	92.4	96
6-9 times	98.9	98.8	98.9
10+ times	100	100	100

Alcohol Related Problems for Current Drinkers

Total Number of Alcohol Related Problems (ARP) reported

Definition: Score is the sum of the dichotomized list of alcohol related consequences

N = 1758

Sample:
Mean: 4.68
SD: 3.59
Median: 5
Range: 0-19

Males:
N: 721
Mean: 4.81
SD: 3.70
Median: 5
Range: 1-19

Females:
N: 1035
Mean: 4.58
SD: 3.52
Median: 4
Range: 1-17

ARP Sample	Sample %	ARP Male	Male %	ARP Female	Female %
0	17.3	0	16.5	0	17.9
1	24.7	1	24.4	1	25
2	32.4	2	32.5	2	32.5
3	41.6	3	41.1	3	42.1
4	49.7	4	48.8	4	50.4
5	58.7	5	56.9	5	60
6	68.8	6	67.5	6	69.8
7	78	7	75.7	7	79.5
8	84.5	8	82.8	8	85.7
9	90.4	9	89.3	9	91.2
10	94.4	10	93.6	10	94.9
11	96.5	11	96.3	11	96.6
12	97.9	12	97.6	12	98.1
13	98.9	13	98.8	13	98.9
14	99.3	14	99.3	14	99.3
15	99.7	15	99.4	15	99.8
17	99.8	18	99.6	17	100
18	99.8	19	100		
19	100				

Injunctive norms tables
Men:

Hangover

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			13.5	
	2			27	
	3			28.6	
	4			15.9	
	5			12.7	
	6			2.4	
	Total	324	100	100	

Blacking Out

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			34.1	
	2			31	
	3			19.8	
	4			7.1	
	5			7.1	
	6			0.8	
	Total	324	100	100	

Work Quality Suffering

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			68.23	
	2			25.4	
	3			4.8	
	4			1.6	
	5			0	
	6			0	
	Total			100	
Missing	System				
Total		324	100		

Feeling Tired

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			25.4	
	2			34.9	
	3			23	
	4			11.9	
	5			4	
	6			0.8	
	Total	323	99.7	100	
Missing	System	1	0.3		
Total		324	100		

Regretting a Sexual Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			35.2	
	2			24	
	3			25.6	
	4			11.2	
	5			1.6	
	6			2.4	
	Total	322	99.4	100	
Missing	System	2	0.6		
Total		324	100		

Unplanned Drinking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			9.5	
	2			22.2	
	3			31	
	4			25.4	
	5			7.9	
	6			4	
	Total			100	
Missing	System	2	0.6		
Total		324	100		

Appearance Harmed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			50	
	2			31	
	3			12.7	
	4			4.8	
	5			1.6	
	6			0	
	Total			100	

Embarasses

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			15.1	
	2			24.6	
	3			27	
	4			21.4	
	5			9.5	
	6			2.4	
	Total			100	
Missing	System				
Total		324	100		

Feeling Sick or Vomiting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			32.8	
	2			35.2	
	3			16	
	4			11.2	
	5			3.2	
	6			1.6	
	Total			100	
Missing	System				
Total		324	100		

Acting Impulsively

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			26.2	
	2			39.7	
	3			20.6	
	4			7.9	
	5			5.6	
	6			0	
	Total	324	100	100	

Gaining Weight

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			25.4	
	2			35.7	
	3			24.6	
	4			11.1	
	5			3.2	
	6			0	
	Total	324	100	100	

Waking up in a Strange Place

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			42.1	
	2			27.8	
	3			14.3	
	4			11.1	
	5			4	
	6			0.8	
	Total	324	100	100	

Spending too much time Drinking

			Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1			39.7	
		2			28.6	
		3			18.3	
		4			11.1	
		5			2.4	
		6			0	
	Total		323	99.7	100	
Missing	System		1	0.3		
Total			324	100		

Feeling bad about myself

			Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1			55.6	
		2			33.1	
		3			7.3	
		4			1.6	
		5			2.4	
		6			0	
	Total				100	
Missing	System		2	0.6		
Total			324	100		

Problems with spouse or partner

			Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1			50	
		2			33.3	
		3			12.7	
		4			3.2	
		5			0.8	
		6			0	
Missing	System					
Total			324	100		

Needing a drink after waking up

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			74.6	
	2			17.5	
	3			4	
	4			3.2	
	5			0.8	
	6			0	
	Total			100	
Missing	System				
Total		324	100		

Drinking and Driving

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			88.1	
	2			6.3	
	3			2.4	
	4			2.4	
	5			0	
	6			0.8	
	Total	324	100	100	

Neglecting Obligations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			71.2	
	2			17.6	
	3			7.2	
	4			2.4	
	5			1.6	
	6			0	
	Total			100	
Missing	System				
Total		324	100		

Difficulty Limiting Drinking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			44	
	2			29.6	
	3			15.2	
	4			6.4	
	5			3.2	
	6			1.6	
	Total			100	
Missing	System	1	0.3		
Total		324	100		

Passing out

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			33.3	
	2			32.5	
	3			23.8	
	4			6.3	
	5			3.2	
	6			0.8	
	Total	324	100	100	

Acting Rude

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			33.3	
	2			38.1	
	3			19	
	4			7.9	
	5			1.6	
	6			0	
	Total			100	

Drinking more for the same effect

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			21.4	
	2			28.6	
	3			23	
	4			19	
	5			6.3	
	6			1.6	
	Total	324	100	100	

newfriends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			6.3	
	2			11.1	
	3			15.1	
	4			27.8	
	5			23	
	6			16.7	
	Total	324	100	100	

relax

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			5.6	
	2			9.5	
	3			19	
	4			18.3	
	5			30.2	
	6			17.5	
	Total	324	100	100	

Women:

Hangover

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			15.2	
	2			25.4	
	3			28.9	
	4			18.8	
	5			9.6	
	6			2	
	Total	324	100	100	

Blacking Out

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			44.2	
	2			35.5	
	3			12.7	
	4			4.6	
	5			2.5	
	6			0.5	
	Total	324	100	100	

Work Quality Suffering

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			82.1	
	2			12.8	
	3			4.1	
	4			1	
	5			0	
	6			0	
	Total	323	99.7	100	
Missing	System	1	0.3		
Total		324	100		

Feeling Tired

		Frequency	Percent	Valid Percent	Cumulative Percent
	1			25.5	
	2			38.8	
	3			25	
Valid	4			6.1	
	5			3.1	
	6			1.5	
	Total			100	
Missing	System				
Total		324	100		

Regretting a Sexual Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
	1			64.8	
	2			26	
	3			6.1	
Valid	4			2.6	
	5			0.5	
	6			0	
	Total			100	
Missing	System				
Total		324	100		

Unplanned Drinking

		Frequency	Percent	Valid Percent	Cumulative Percent
	1			7.7	
	2			26.2	
	3			30.8	
Valid	4			23.1	
	5			8.7	
	6			3.6	
	Total			100	
Missing	System				
Total		324	100		

Appearance Harmed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			58.4	
	2			31.5	
	3			8.6	
	4			1.5	
	5			0	
	6			0	
	Total			100	

Embarasses

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			19.9	
	2			39.8	
	3			19.9	
	4			12.8	
	5			7.1	
	6			0.5	
	Total			100	
Missing	System				
Total		324	100		

Feeling Sick or Vomiting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			27.4	
	2			43.1	
	3			21.3	
	4			6.1	
	5			1.5	
	6			0.5	
	Total			100	
Missing	System				
Total		324	100		

Acting Impulsively

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			41.6	
	2			36.5	
	3			17.3	
	4			4.1	
	5			0.5	
	6			0	
	Total			100	

Gaining Weight

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			44.2	
	2			35	
	3			17.3	
	4			3	
	5			0.5	
	6			0	
	Total			100	

Waking up in a Strange Place

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			74.1	
	2			16.8	
	3			7.1	
	4			1.5	
	5			0.5	
	6			0	
	Total	324	100	100	

Spending too much time Drinking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			51.5	
	2			33.2	
	3			10.2	
	4			4.1	
	5			0.5	
	6			0.5	
	Total			100	
Missing	System				
Total		324	100		

Feeling bad about myself

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			68.5	
	2			23.4	
	3			7.6	
	4			0.5	
	5			0	
	6			0	
	Total			100	
Missing	System				
Total		324	100		

Problems with spouse or partner

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			62.6	
	2			29.7	
	3			6.2	
	4			0.5	
	5			1	
	6			0	
Missing	System				
Total		324	100		

Needing a drink after waking up

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			92.3	
	2			3.6	
	3			2	
	4			1	
	5			1	
	6			0	
	Total			100	
Missing	System				
Total		324	100		

Drinking and Driving

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			93.4	
	2			2.5	
	3			2.5	
	4			0.5	
	5			0.5	
	6			0.5	
	Total	324	100	100	

Neglecting Obligations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			85.8	
	2			10.7	
	3			3	
	4			0.5	
	5			0	
	6			0	
	Total			100	
Missing	System				
Total		324	100		

Difficulty Limiting Drinking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			60.4	
	2			27.9	
	3			8.6	
	4			3	
	5			0	
	6			0	
	Total			100	
Missing	System				
Total		324	100		

Passing out

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			55.8	
	2			29.4	
	3			12.2	
	4			2	
	5			0.5	
	6			0	
	Total	324	100	100	

Acting Rude

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			54.8	
	2			34.5	
	3			7.6	
	4			3	
	5			0	
	6			0	
	Total	324	100	100	

Drinking more for the same effect

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			42.1	
	2			33	
	3			17.3	
	4			6.1	
	5			1.5	
	6			0	
	Total	324	100	100	

newfriends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			11.2	
	2			11.7	
	3			17.8	
	4			31	
	5			18.3	
	6			10.2	
	Total	324	100	100	

relax

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1			10.2	
	2			9.6	
	3			25.4	
	4			23.4	
	5			21.3	
	6			10.2	
	Total	324	100	100	

Appendix D

Fidelity Checklist

#(%)	Fidelity Checklist
	Descriptive Norms/Combined
	Present students with information about his or her drinking patterns on the baseline survey
24 (100)	1. Number of times he or she reported drinking in the past month
24 (100)	2. How much he or she reported drinking on a typical drinking day
24 (100)	3. How many drinks he or she reported drinking on the heaviest drinking day
	Compared student's drinking with the drinking of same sex college students at SU
24 (100)	4. Provided information that he or she drank as much or more than X% of same sex students at SU
	Heavier drinking days
24 (100)	5. Provided student with his or her reported number of heavy drinking days in the past two weeks
24 (100)	6. Informed student that he or she had as many or more heavier drinking days in past two weeks than X% of same sex students at SU.
	Perceptions of others drinking
24 (100)	7. Explanation of what perceived drinking norms are
24 (100)	8. Provided student with his or her estimate of other students' drinking
24 (100)	9. Provided student actual number of drinks per week consumed by a same sex SU student
22 (92)	10. Queried and discussed, "what went into your estimate?
24 (100)	11. Discussion about how your perception of how much others are drinking can influence how much you drink
	Injunctive/Combined
	Present students with information about his or her own attitudes reported on the survey regarding excessive drinking and consequences
21 (100)	1. Review two consequences the student reported as the most acceptable
21 (100)	2. Review the consequences the student reported as the most unacceptable
	Your attitudes compared to SU average
21 (100)	3. Present the actual attitudes of same sex SU students regarding the consequences the 4. student rated as acceptable
21 (100)	4. Present the actual attitudes of same sex SU students regarding the consequences the student rated as unacceptable
	Discussion of the graph
21 (100)	5. Discuss the graph juxtaposing the student's attitudes toward excessive drinking on average compared to his or her perceptions of the acceptability of excessive drinking by same sex SU students on average, and the actual acceptability of excessive drinking by same sex SU students on average
21 (100)	6. Discussion of student's own acceptability compared to actual.
19 (90)	7. Discussion of student's own acceptability compared to perceived norm.
20 (95)	8. Discussion of student's actual compared to perceived norm.
	Perceptions of others attitudes
21 (100)	9. Present student with the histograms for black outs, passing out, and sexual regret with arrows indicating personal attitudes, perceived attitudes and actual attitudes of same sex SU students
21 (100)	10. Discussion about personal, perceived, and actual ratings of black outs, passing out and sexual regret
21 (100)	11. Discussion about how your perception of how acceptable you think others find excessive drinking may be influencing your own attitudes
Average	98.95% fidelity

Appendix E

IRB Approved Consent Form

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Consent Form
Understanding Students' Alcohol Use
Investigators: Mark Prince and Dr. Stephen Maisto
IRB #: 12-230

INTRODUCTION AND PROCEDURES

The purpose of this form is to describe to you the study that you are thinking about participating in, and to describe your rights as a research participant. A copy of this form will be provided for your own records. If you have any concerns after reading this form, please ask the research assistant, who will clarify any questions you may have.

The purpose of this study is to assess students' perceptions of their peers' alcohol use and attitudes toward alcohol in relation to their own use and attitudes.

This study will involve one meeting in our research offices in 804 University Avenue, and one web-based survey that you can complete from home. After the first meeting, you will receive 0.5 units of course credit per half hour for your participation time, and after the follow-up survey you will receive a $15 payment for your participation. If you choose to withdraw from the study you will still be awarded 0.5 units of course credit per hour of your participation. This credit may be course credit or extra credit depending on the amount of research you have participated in prior to your participated in this study as outlined in the SONA and PSY205 guidelines. The research team will report back only that you have participated or not. NO OTHER INFORMATION ABOUT YOU WILL BE SHARED WITH YOUR PSYCHOLOGY PROFESSOR.

Here is what you can expect if you choose to participate in this study:

A. Baseline Survey. Today you will complete a web-based survey. The survey will help us to better understand you and your unique alcohol-related beliefs and experiences, and will take less than half an hour.

B. You will participate in one of two conditions. Your assignment will be determined randomly, similar to flipping a coin.

- If you are assigned to the educational program, you will meet with a trained graduate student to review the information you provided on the survey you will complete today. This meeting will explore your use of alcohol and your perceptions of your peers' alcohol use. This session will be audiotaped for continued training and quality control check purposes, and it will take about a half an hour. The tapes will be stored in locked cabinets that will be kept in a designated locked room. All tapes used for this study will be destroyed at the end of the project. After you finish the one-on-one discussion, you will complete a brief questionnaire to share your thoughts about the discussion.

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- If you are assigned to no education condition, you will be asked to fill out an additional survey.

C. Follow-up opportunity. All students will be invited to participate in a second brief 30-minute follow-up assessment one month later. *This follow-up assessment is not for course credit*, so we will pay you $15 for the time it takes you to complete the 1-month follow-up assessment. If a participant withdraws from this follow-up without completing the entire survey a $5 payment will be made. This additional assessment is important for the research study because it allows us to learn more about college students' experiences with alcohol over time. So that we can contact you when the follow-up is due, we will ask you to provide information that can help us locate you during the next month.

CONFIDENTIALITY

Because some of the information we request is sensitive in nature, we have taken several steps to protect your privacy: (a) your name will not be directly connected to any research information, because code numbers will be used to identify information about you; (b) we have trained all research team members to maintain the confidentiality of your data; (c) all forms we collect with your name (e.g., this consent form and future contact information) will be stored in locked file cabinets, separate from your questionnaire data; and (d) in reports about this study, only group data will be presented so that no individual can be identified. *Please note that the research team does not share any specific information about you with any other departments or offices of Syracuse University.*

There are a very few circumstances when we are ethically compelled to release identifying information. The researches will take steps (including notifying authorities) to protect you or someone else from serious harm, including child abuse. The researcher is not immune to legal subpoena about illegal activities. Although it is very unlikely, if law enforcement officials asked to see my data, I would have to give it to them. Because of the steps we have taken, the risk that your privacy will be violated is minimal.

RISKS AND BENEFITS

You may receive direct benefit from the study by becoming more informed about alcohol and its effects that you may have not have been aware of previously. In addition, you will be helping us to better understand college students' personal attitudes and perceptions about alcohol use on campus. This will benefit college students at Syracuse University and across the United States.

It is possible that answering questions about your alcohol or drug use might cause some discomfort. If you feel uncomfortable answering any of the questions in the surveys, you can decline to answer. In the event that you feel that you need to talk to a professional about any concerns you might have, you may obtain on-campus help at the Office of Prevention Services (315) 443-4234, the Psychiatric Counseling Service (315) 443-4715, or the Psychological Services Center (315) 443-3595. If you have questions about your rights as a research participant, concerns/complaints that you wish to address to someone other than the investigator, or if you cannot reach the investigator you may contact Syracuse University's

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Institutional Review Board at (315) 443-3013. Questions about this study should be directed to Dr. Stephen Maisto at (315) 443-2334 or samaisto@syr.edu.

Your participation is completely voluntary. If, at any time during this study, you do not wish to continue, it is your right under federal and university guidelines to withdraw *without penalty* If you choose to withdraw from this study prior to completing all appointments you will be compensated with partial credit or partial payment based on the time you gave to participation (i.e., 1 credit per hour and $5 for partially completing the follow-up survey).

ALTERNATIVES TO PARTICIPATION

You do not need to participate in this study to gain course credit for your psychology course. Other surveys are available to you to receive credit, and there is no penalty to your grade or otherwise if you choose not to participate.

By signing this, I indicate that all of my questions have been answered and I willingly participate in this research.

Please check:

☐ I **agree** to be audio taped ☐ I **do not agree** to be audio taped

Signature	Printed Name	Date
Person Obtaining Consent	Printed Name	Date

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Table 1. Hypothesized reactions to intervention conditions.

Drinker Status	Condition	Reaction to DN	Reaction to IN	Actual-Ideal Discrepancy	Affective Response	Outcome
Heavy Drinker	*Control*	n/a	n/a	n/a	n/a	No change
	DN only	I drink more than average	n/a	I should drink less	Negative Affect	Decreased Drinking
	IN only	n/a	Others do not approve of my current drinking	I thought they were more approving, I should drink less	Negative Affect	Decreased Drinking
	DN + IN	I drink more than average	Others do not approve of my current drinking	I should drink less	Negative Affect	Decreased Drinking
Light Drinker	*Control*	n/a	n/a	n/a	n/a	No change
	DN only	I drink less than average	n/a	I should drink more	Negative affect	Increase in drinking
	IN only	n/a	Others approve of my current drinking	I should stay the same	Positive affect	No change in drinking
	DN + IN	I drink less than average	Others approve of my drinking	I should stay the same	Positive affect	No change in drinking

Note: DN = descriptive Norms feedback; IN = injunctive norms feedback.

Table 2 Description of alcohol use and consequences variables.

Variable Name	Assessment Property
tBAC	Assesses typical level of intoxication on drinking days in the past month controlling for rate of consumption, sex, and weight
pBAC	Assesses peak level of intoxication on drinking days in the past month controlling for rate of consumption, sex, and weight
tDPW	Assesses typical quantity of alcohol consumed on per week in the past month
hDPW	Assesses quantity of alcohol consumed in the heaviest week in the past month
Max	Assesses the maximum number of drinks consumed on a single day in the past month, regardless of rate of consumption, sex, and weight
ARC	Assesses number of alcohol related consequences reported in the past month

Note: tBAC = typical blood alcohol content; pBAC = peak blood alcohol content; tDPW = typical drinks per week; hDPW = heavy drinks per week; ARC = alcohol related consequences; Max = maximum number of drinks consumed in a single day

Table 3. Demographic characteristics by treatment condition.

	Descriptive Norms	Injunctive Norms	Combined	Control	Total Sample
N	34	37	31	31	133
Male	53%	41%	52%	54%	50%
Non-Hispanic	91%	89%	94%	90%	91%
White	68%	81%	84%	77%	77%
On-Campus	79%	73%	65%	74%	73%
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Typical DPW	13.15 (10.98)	10.81 (6.59)	15.67 (9.45)	12.00 (9.83)	12.82 (9.35)
Heavy DPW	17.24 (12.85)	16.00 (10.91)	20.06 (11.76)	19.90 (19.48)	18.17 (13.95)
Number of Consequences	6.06 (3.80)	6.89 (3.81)	7.03 (4.27)	6.03 (4.03)	6.52 (3.95)

Note: M = mean; SD = Standard Deviation, DPW = Drinks per Week.

Table 4a. Expected pattern of students' perception of others' drinking relative to their own drinking and relative to the actual drinking levels of others.

Descriptive Norms

	Light	Heavy
Perception > Self	100%	86%
Self > Actual	0%	88%
Both >	0%	74%

Table 4b. Expected pattern of students' perception of others' attitudes about the acceptability of excessive drinking relative to their own attitudes about the acceptability of excessive drinking and relative to the actual attitudes of others with regard to the acceptability of excessive drinking.

Injunctive Norms

	Light	Heavy
Perception > Self	88%	77%
Self > Actual	72%	80%
Both >	63%	61%

Table 5. Distributional Assumptions Test: Sample Size Adjusted Bayesian Information Criterion comparing regression model fit with normal distribution, square root transformed normal distribution, and gamma/negative binomial distributions.

	Normal	Square Root	Gamma or NB
tBAC	-237.53	-111.20	-422.17
pBAC	-314.15	-176.04	-297.55
tDPW	979.26	456.57	1020.05 [a]
hDPW	992.71	433.96	1044.36 [a]
ARC	702.62	325.68	670.56[a]
Max	705.48	336.69	785.42

Note: tBAC = typical blood alcohol content; pBAC = peak blood alcohol content; tDPW = typical drinks per week; hDPW = heavy drinks per week; ARC = alcohol related consequences; Max = maximum number of drinks consumed in a single day; NB = negative binomial; [a] = indicates that negative binomial distribution was tested, otherwise gamma distribution was tested.

Table 6 Correlations among alcohol use and consequences variables at baseline and follow-up.

	1	2	3	4	5	6	7	8	9	10	11
Baseline											
1. tBAC											
2. pBAC	.50**										
3. tDPW	.35**	.60**									
4. hDPW	.36**	.63**	.88**								
5. Max	.35**	.66**	.69**	.81**							
6. ARC	.23**	.35**	.50**	.50**	.42**						
Follow-up											
7. tBAC	.27**	.25**	0.16	0.13	0.16	0.13					
8. pBAC	.29**	.53**	.42**	.38**	.39**	.39**	.41**				
9. tDPW	.23**	.36**	.58**	.54**	.50**	.34**	.33**	.56**			
10. hDPW	.27**	.47**	.67**	.63**	.58**	.37**	.33**	.69**	.86**		
11. Max	.27**	.29**	.33**	.32**	.30**	.48**	.31**	.48**	.47**	.46**	
12. ARC	.27**	.45**	.58**	.59**	.67**	.34**	.29**	.77**	.70**	.80**	.43**

Note: * $p < .05$; ** $p < .01$; tBAC = typical blood alcohol content; pBAC = peak blood alcohol content; tDPW = typical drinks per week; hDPW = heavy drinks per week; ARC = alcohol related consequences; Max = maximum number of drinks consumed in a single day

Table 7. Significant direct paths for light drinkers in the serial mediation path models.

	Light Drinkers					
	tBAC	pBAC	tDPW	hDPW	Max	ARC
Paths to follow up						
Time to FU				•		
Baseline pBAC	•	•	•	•	•	•
DN VS IN	•					
DN VS CB						
DN VS CL						
IN VS CB						
IN VS CL						
CB VS CL						
Negative Affect						•
Positive Affect						
AID						
Paths to actual-ideal discrepancy						
DN vs IN						
DN vs CB					•	•
DN VS CL						
IN VS CB					•	
IN VS CL						
CB VS CL					•	
Path to negative affect						
AID	•		•		•	
Path to positive affect						
AID						•

Note: tBAC = typical blood alcohol content; pBAC = peak blood alcohol content; tDPW = typical drinks per week; hDPW = heavy drinks per week; ARC = alcohol related consequences; Max = maximum number of drinks consumed in a single day; FU = Follow-up; DN = descriptive norms; IN = injunctive norms; CL = control; CB = combined; AID = actual-ideal discrepancy.

Table 8. Significant direct paths for heavy drinkers in the serial mediation path models.

	Heavy Drinkers					
	tBAC	pBAC	tDPW	hDPW	Max	ARC
Paths to follow up						
Time to FU				•		
Baseline pBAC	•	•	•	•	•	•
DN vs IN						
DN VS CB			•			•
DN VS CL			•			
IN VS CB						
IN VS CL		•		•		
CB VS CL						
Negative Affect						
Positive Affect						
AID	•		•	•	•	
Paths to actual-ideal discrepancy						
DN vs IN						
DN vs CB						
DN VS CL						
IN VS CB						
IN VS CL						
CB VS CL						
Path to negative affect						
AID	•	•	•	•	•	•
Path to positive affect						
AID		•	•	•	•	•

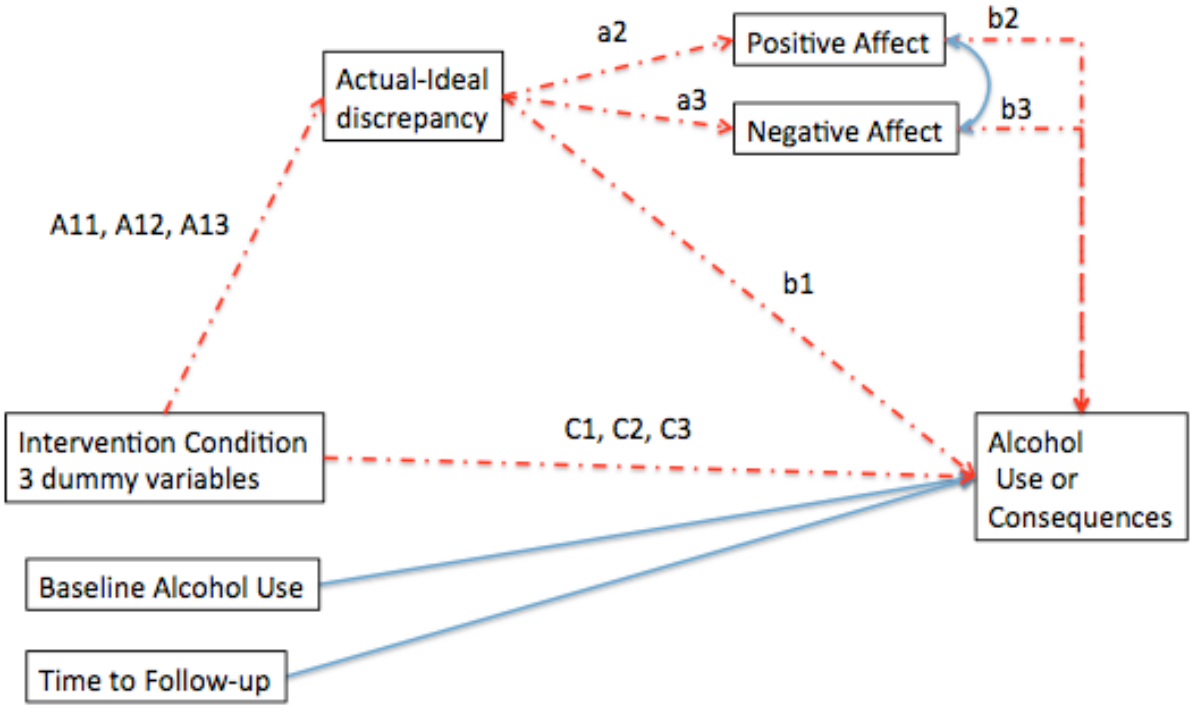
Note: tBAC = typical blood alcohol content; pBAC = peak blood alcohol content; tDPW = typical drinks per week; hDPW = heavy drinks per week; ARC = alcohol related consequences; Max = maximum number of drinks consumed in a single day; FU = Follow-up; DN = descriptive norms; IN = injunctive norms; CL = control; CB = combined; AID = actual-ideal discrepancy

Table 9. Overall model fit for multi-group serial mediation path models.

	tBAC	pBAC	tDPW	hDPW	Max drink	Consequences
saBIC	2554	2034	2591	2554	2556	2473
χ^2-test						
χ^2-Value	33.67	23.49	42.81	63.50	75.11	31.82
(df)	(26)	(26)	(26)	(26)	(26)	(26)
p-value	.14	.61	.02	.00	.00	.20
RMSEA						
Estimate	.07	0.00	.10	.15	.18	.06
(CI)	(0.00, 0.13)	(0.00, 0.09)	(0.04, 0.15)	(0.10, 0.20)	(0.13, 0.23)	(0.00, 0.12)
p-value	.31	.78	.08	.00	.00	.38
CFI	.82	1.00	.78	.69	.62	.89
TLI	.64	1.11	.56	.37	.25	.78
SRMR	.07	.06	.08	.10	.11	.07

Note: tBAC = typical blood alcohol content; pBAC = peak blood alcohol content; tDPW = typical drinks per week; hDPW = heavy drinks per week; ARC = alcohol related consequences; Max = maximum number of drinks consumed in a single day; saBIC = sample size adjusted Bayesian Information Criterion; RMSEA = root mean squared error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Squared Residual, CI = Confidence Interval; df = degrees of freedom.

Figure 1. Multi-group path analysis serial mediation by drinker status and categorical intervention condition.



Note: Dotted paths are expected to differ by drinker status.

Figure 2. Observed Power Curve.

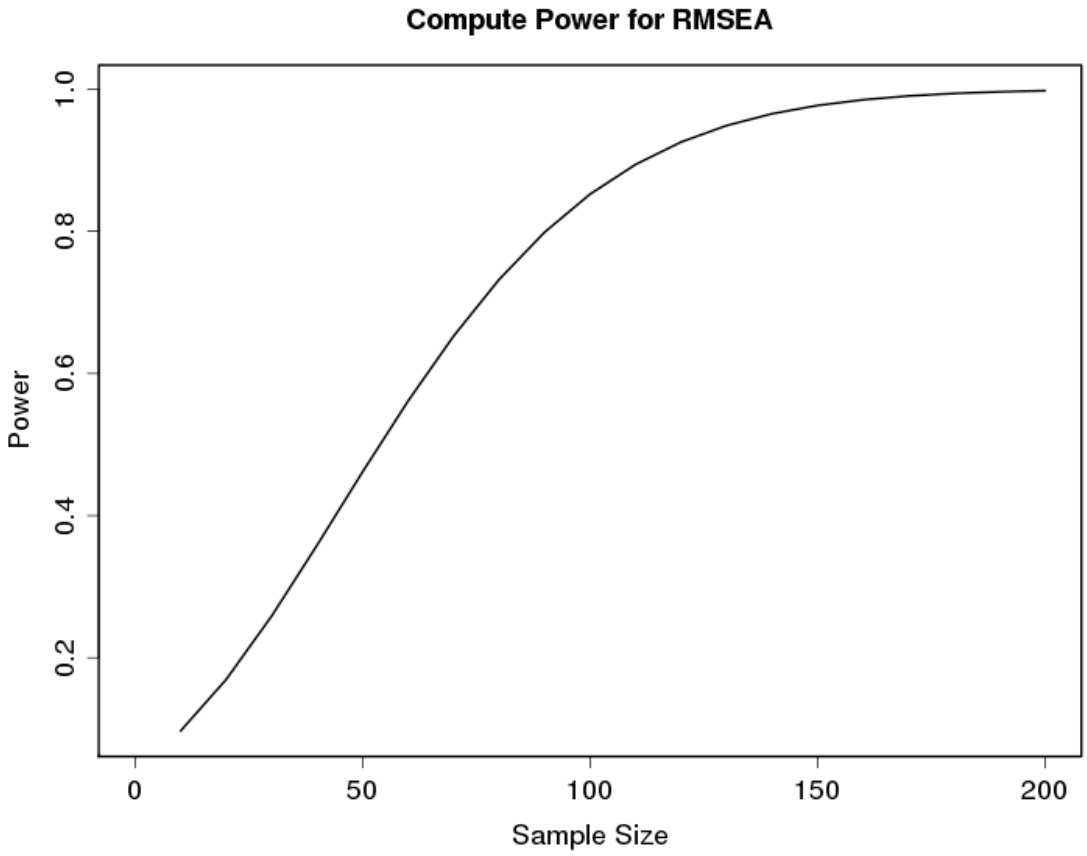
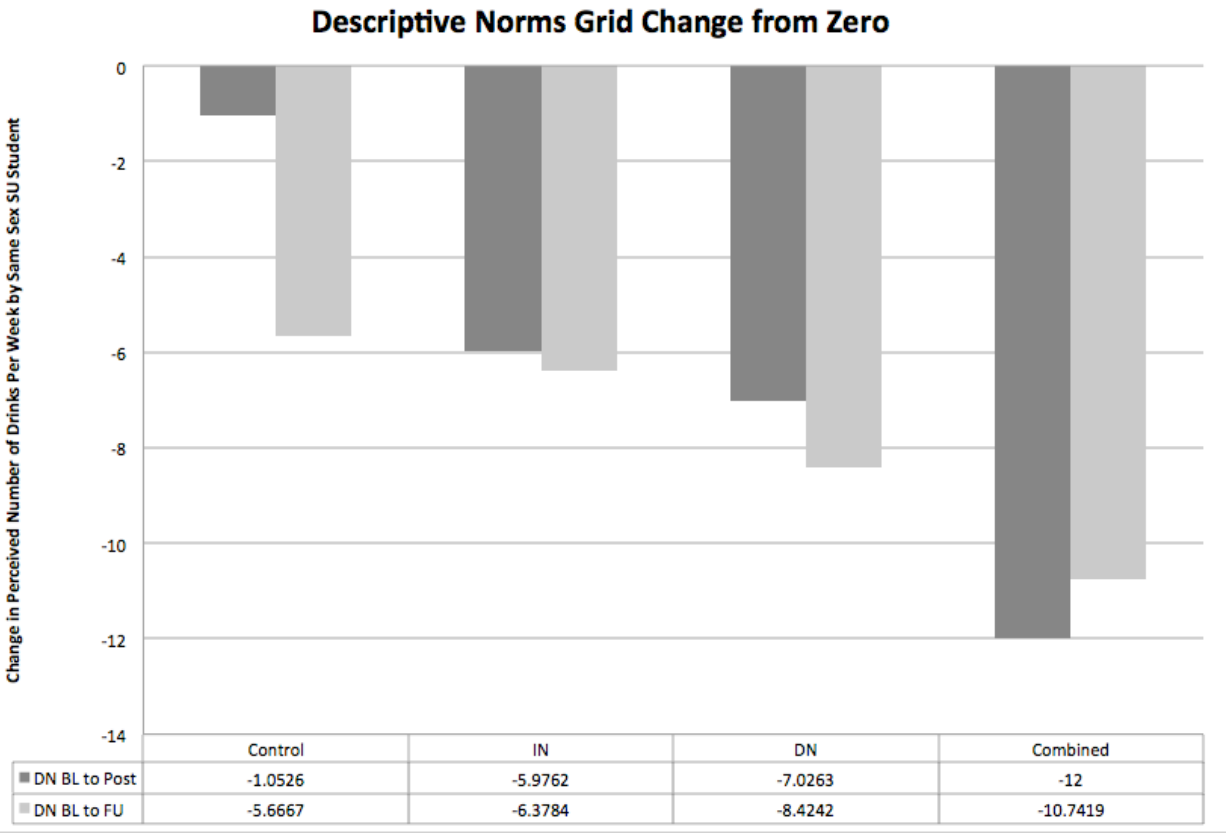
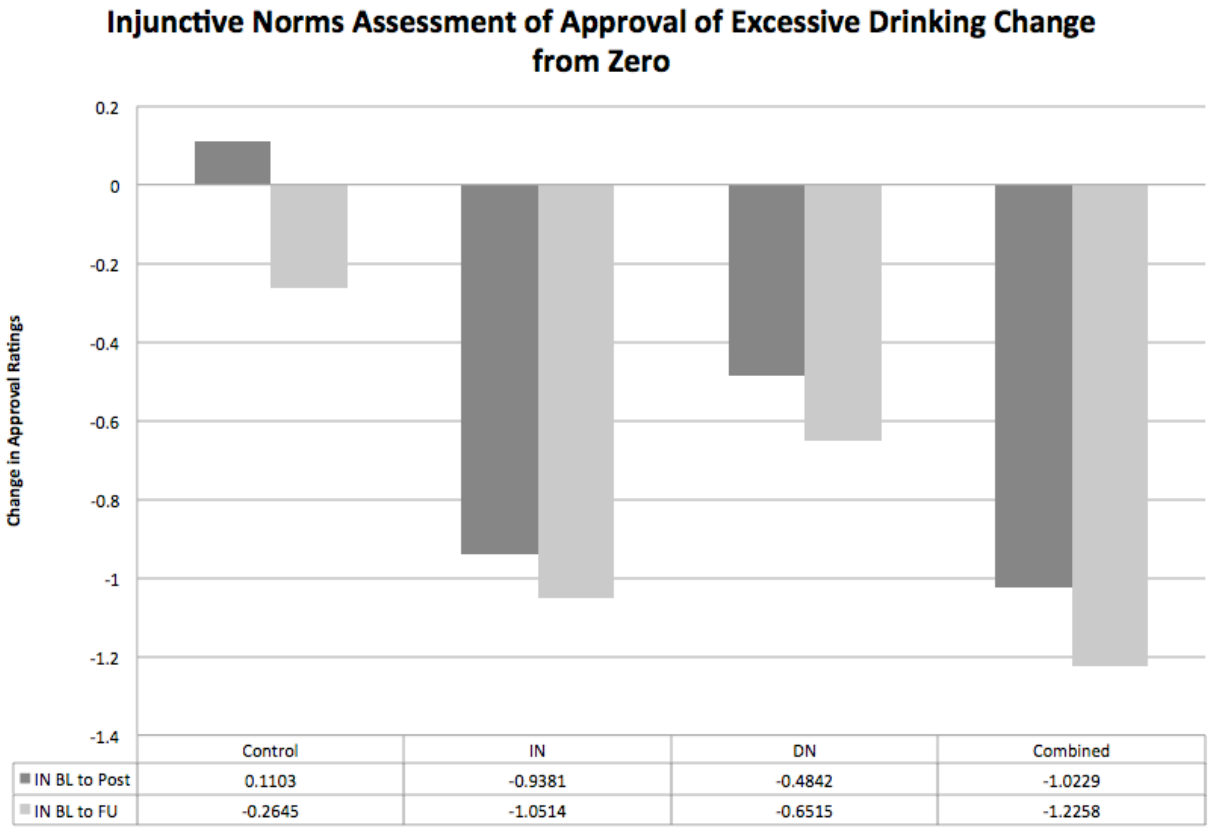


Figure 3. Descriptive Norms Change from Zero.



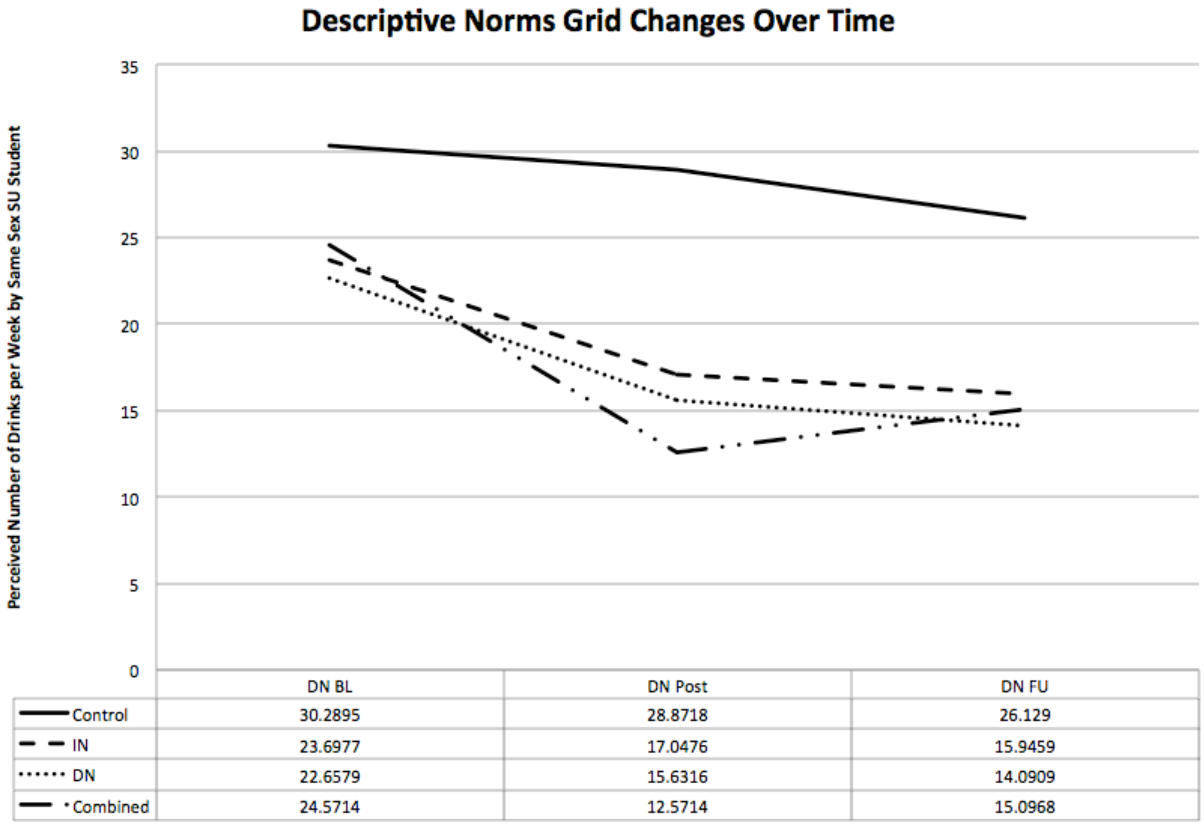
Note: IN = injunctive norms; DN = descriptive norms; BL = baseline; FU = follow-up.

Figure 4. Injunctive Norms Approval Change from Zero.



Note: IN = injunctive norms; DN = descriptive norms; BL = baseline; FU = follow-up.

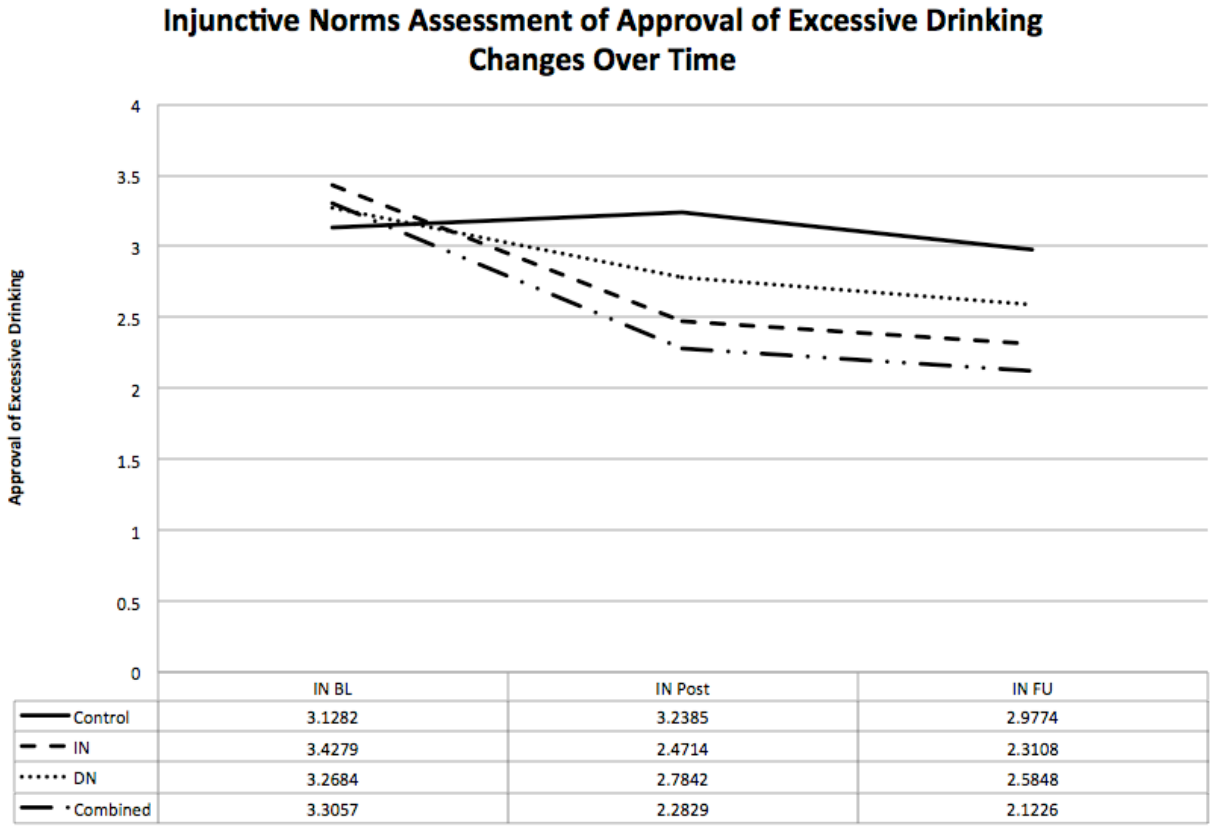
Figure 5. Descriptive Norms Change Over Time.



	DN BL	DN Post	DN FU
Control	30.2895	28.8718	26.129
IN	23.6977	17.0476	15.9459
DN	22.6579	15.6316	14.0909
Combined	24.5714	12.5714	15.0968

Note: IN = injunctive norms; DN = descriptive norms; BL = baseline; FU = folllow-up.

Figure 6. Injunctive Norms Approval Change Over Time.



	IN BL	IN Post	IN FU
Control	3.1282	3.2385	2.9774
IN	3.4279	2.4714	2.3108
DN	3.2684	2.7842	2.5848
Combined	3.3057	2.2829	2.1226

Note: IN = injunctive norms; DN = descriptive norms; BL = baseline; FU = follow-up.

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