

The Longitudinal Mutual Influence Model of Risky Alcohol Use and Social Norms Perceptions

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Spring 2013

**A thesis presented to the faculty of The University of North Carolina at Chapel Hill in  
partial fulfillment of the requirements for the Bachelor of Science degree with Honors in  
Psychology**

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### **Acknowledgements**

I would like to first thank my committee members for the roles they have played in my personal, academic, and professional development. Dr. Mitch Prinstein, for the many hours he dedicated to guiding me through the thesis process and for his continuous dedication to my own professional development, as well as the professional development of all those around him. Dr. Don Baucom, whose influence on me has been both direct (through his thoughtful teaching and genuine discussions outside the classroom) and indirect (through teaching my father). Dr. Viji Sathy, who taught the first statistics class I ever took; the class, which taught me to love statistics, remains the catalyst of my initial and continued interest in Quantitative Psychology. I would also like to thank Heather Wells, my first research lab supervisor (or my “pseudo-mother” in Chapel Hill, as she would prefer to be called), for her continued support, even after I chose to pursue psychological research. Finally, I would like to thank my parents, Jan and Pete Giordano, who taught me *how* to think instead of what to think, who exemplify a lifetime of learning, who provided me with the opportunity of a world-class education, and most of all for their steadfast care, even while I have been a great physical distance from home.

### **Abstract**

Past research has shown that college students consistently misperceive the amount of alcohol that their peers consume; consistent with theories of peer influence, this misperception is associated with personal use of alcohol. Few studies to date have used a longitudinal design in order to test changes over time as well as a model of mutual influence between alcohol use and social norms perceptions. A representative sample of 889 UNC students completed survey questionnaires during their summer orientation, again four months later, and finally four years later. Risky alcohol use, social norms perceptions, academic achievement, and misconduct all were assessed. Latent growth curve modeling revealed that social norms perceptions before entering college were related significantly to baseline levels of alcohol use. Both initial levels of alcohol use and *changes* in alcohol use predicted later social norms perceptions, confirming recent research that has suggested reciprocal influence effects. Analyses showed that alcohol use prior to college is a predictor of academic achievement, but change in alcohol use is not. Changes in alcohol use were not associated with initial social norms perceptions and did not predict academic achievement or misconduct; explanations and model improvements are discussed. Findings underscore the importance of the transition period between high school and college and highlight the reciprocal relationship between alcohol use and social norms perceptions.

*Keywords:* alcohol use, social norms perceptions, longitudinal, college

### The Longitudinal Mutual Influence Model of Social Norms Perceptions and Risky Alcohol Use

Alcohol is widely considered the most abused substance on college campuses. Despite efforts to educate young adults and slow rates of alcohol abuse, national representative surveys have shown that alcohol abuse is still prevalent (Wechsler & Nelson, 2008). Traditionally, college administrators have attempted to decrease alcohol use by employing strategies based around fear of negative consequences, ideas for abstinence, and drinking responsibly (Haines & Barker, 2003). Following unsuccessful attempts to slow rates of alcohol abuse, researchers have started focusing on how perceptions of peer behaviors affect personal behavior. This emerging model for understanding substance abuse is referred to as “the social norms approach” (Perkins, 2003). The current study uses theories of social norms and alcohol use and addresses the model of behavior longitudinally.

### **Prevalence and Consequences Alcohol Use**

The study of alcohol use among college students dates back to the 1950s. The earliest study was presented by Straus and Bacon (1953) in the book *Drinking in College*. Later, Blane and Hewitt (1977) published a comprehensive review of alcohol literature from 1960-1975. Most importantly, they concluded that rates of drinking among college students were rising during that time period and were continuing to rise (Blane & Hewitt, 1977; O’Malley & Johnston, 2002). In the last 3 decades studies have become more comprehensive and the availability of data has increased significantly (O’Malley & Johnston, 2002).

More recent studies have used nationwide samples to assess alcohol consumption trends in college. Between 1992 and 2006, the Harvard School of Public Health College Alcohol Study conducted four national surveys administered to over 14,000 students at 120 four-year colleges. Between 1993 and 2001, national rates of heavy drinking remained steady at approximately 40%

(Wechsler & Nelson, 2008). Average rates of alcohol consumption remained the same but drinking norms became more polarized throughout the course of the study (Wechsler & Nelson, 2008). In other words, the rates of abstaining and binge drinking have both increased. This is concerning because binge drinking is considered the most harmful way to consume alcohol. Another study with over 15,000 participants classified two of every five students as “heavy drinkers” (O’Malley & Johnston, 2002). While alcohol use alone is not alarming, the rate of heavy drinking among college students is still high.

Generally, binge drinking is characterized as the consumption of excessive/dangerous amounts of alcohol. In research, studies have operationalized binge drinking in a variety of ways. Most commonly, binge drinking is operationalized as the consumption of five or more drinks on one occasion for males and the consumption of four or more drinks on one occasion for females (Bonar et al., 2012; Wechsler & Nelson, 2008). While Wechsler and colleagues have defended this method for its simplicity and the ease of which it can be administered to large populations, it also has its flaws. The +five/+four method fails to account for the time during which the drinks were consumed and the tolerance of each individual drinker. Also, the +five/+four method could overestimate the amount of binge drinking occurring among college students (Bonar et al., 2012; Wechsler & Nelson, 2008). In response to this, in 2007 the National Institute of Alcohol Abuse and Alcoholism (NIAAA) defined binge drinking as “a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram-percent or above. For a typical adult, this pattern corresponds to consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours” (National Institute on Alcohol Abuse and Alcoholism, 2007).

Understanding alcohol use and binge drinking is important because of the health and societal consequences caused by alcohol abuse. The NIAAA (2007) has estimated that 1,825

college students die every year due to alcohol related consequences. Nearly 3 million students between the ages of 18-24 report driving a car under the influence of alcohol. Over 690,000 students are assaulted every year by another student who has been drinking. Aside from health consequences, alcohol use may contribute to academic problems and increased dropout rates (Perkins, 2002; Wechsler & Nelson, 2008). Singleton (2007) found that even after controlling for SAT scores and high-school class rank (the best predictors of collegiate success), consumption of alcohol remained significantly negatively correlated with academic performance in college. Another study found that alcohol use negatively correlated with GPA after controlling for personality predictors, which were the most significant predictors of academic achievement (Musgrave-Marquart, Bromley, & Dalley, 1997). Finally, in a study involving 96 institutions and over 28,000 participants, students who reported heavy *and* frequent alcohol consumption were the most likely to experience academic failure (Presley & Pimentel, 2006).

### **Understanding Alcohol Use via Social Norms**

The behavioral underpinnings of alcohol use have been studied through many different perspectives. For example studies have shown correlations between certain genes and alcohol dependency (Grant et al., 2009). Other studies have looked at socioeconomic variables during development and found that heavy alcohol use can be predicted by inharmonious family relationships, social advantage, and internalizing problems (Maggs, Patrick, & Feinstein, 2008). The current study examines alcohol use through the lens of social norms. Peers play a vital role in the development of adolescents and young adults, and the social norms of adolescents' have large impacts on behaviors and attitudes that individuals adopt (Brown, Bakken, Ameringer, & Mahon, 2008).

Social norms are properties of groups that establish normative behaviors and attitudes (Miller & Prentice, 1996). Researchers often distinguish between two types of social norms: descriptive and injunctive norms (Cialdini, Reno, & Kallgren, 1990). Descriptive norms relate specifically to behavior (ex., how much or how often an action is done), and injunctive norms relate to attitudes (ex., approval or disapproval). An example of an alcohol related descriptive norm would be that the average student drinks two alcoholic beverages per occasion. An injunctive norm might be that students find it socially unacceptable to drink excessively.

Perkins and Berkowitz (1986) documented an important misperception of alcohol social norms, which has been studied extensively since its first documentation. They found that students significantly overestimated the average amount of alcohol consumed by their peers, and they overestimated the permissive attitudes of their peers (Perkins & Berkowitz, 1986). In this first documentation of misperceiving the norm, there was no significant correlation between perception of the norm and personal use. In subsequent years, this phenomenon has been repeatedly documented, in more than 25 different studies (Perkins, Haines, & Rice, 2005). Misperceptions of alcohol norms occur across genders, ethnicities, geographic locations, and schools. Studies have shown that students' perceptions of the drinking norm, not the actual norm, are the best predictor of personal drinking behavior (Neighbors, Dillard, Lewis, Bergstrom, & Neil, 2006; Perkins et al., 2005). In a study of over 76,000 participants ranging from 130 different schools, Perkins et al. (2005) found that the perception of the drinking was a greater predictor than gender, race, greek membership (i.e., membership in a fraternity or sorority), and even the actual drinking norm.

The study of perceptions of alcohol social norms is part of a broader category of norms perceptions research. Past research has assessed people's ability to estimate the behaviors and

attitudes of others (i.e., how well they perceive norms) (Nisbett & Kunda, 1985). Nisbett and Kunda's study (1985), which did not specifically examine alcohol norms, concluded that people are *generally* good at perceiving norms. Findings suggested some over-estimation, but specific behaviors were not tested individually (Nisbett & Kunda, 1985). The difference in findings between general social norms perceptions and alcohol social norms perceptions suggests that alcohol social norms are unique in how they become misunderstood.

Prentice (2008) has described the development of alcohol misperceptions through pluralistic ignorance. Pluralistic ignorance happens in a situation in which most people privately reject a norm, but publicly support it because they are afraid of calling attention to themselves (Miller & McFarland, 1991). A good example comes from a classroom setting. A lecturer stops to ask if anyone has any questions. Several students probably want the lecturer to clarify *something*. However, they might not raise any questions because they assume everyone else understands the material. Nobody publicly defies the norm by asking a question, leading others to believe that their peers personally agree with the norm, and understand the material. Studies have shown pluralistic ignorance to be present with regard to alcohol use; students think that their peers are more comfortable with alcohol use than they really are (Prentice & Miller, 1993; Schroeder & Prentice, 1998; Suls & Green, 2003).

Pluralistic ignorance deals with perceiving attitudes, so it can only explain misperceptions of injunctive alcohol norms and not descriptive norms (Prentice, 2008). Misperceiving descriptive norms has been theorized to be a function of (a) the fundamental attribution error, (b) conversations and memory, and (c) media (Perkins, 2003; Perkins, 1997; Prentice, 2008). The fundamental attribution error is the tendency to attribute other peoples' behavior to dispositional factors while attributing one's own behavior to more situational factors



(Jones & Harris, 1967). If we attribute drinking habits of others to internal attitudes, instead of situational factors, then we are likely to think that drinking is more permissive and happens more often. Next, the way we remember events and talk about them is crucial to misperceiving norms. College students are more likely to discuss and remember people who drank the most rather than those who had one or two drinks. The majority of college students drink responsibly, but the most inebriated students are talked about and remembered, which makes drinking greater quantities more salient. Finally, the media confirms these false biases. Popular movies show extravagantly drunk college students, and modern music overemphasizes partying and drinking excessively. All of these factors additively contribute to students misperceiving descriptive drinking norms (Miller & Prentice, 1996).

The accuracy of alcohol social norms perceptions and the effects that they have on behavior vary depending upon several factors. Several studies have found significant gender differences, although these findings have been somewhat mixed (Borsari & Carey, 2003). Gender effects are important to understand because gender is the second most important predictor of alcohol use, behind perceived college norms (Perkins et al., 2005). Most studies have found that perceptions of alcohol use have larger effects for males than for females (Borsari & Carey, 2003; Lo, 1995; Prentice & Miller, 1993; Schroeder & Prentice, 1998; Suls & Green, 2003). This could be because alcohol is a more integral part of social activities for males (Prentice & Miller, 1993). In one study, males reported more social pressure to drink and more embarrassment about expressing alcohol related concerns; females, on the other hand, expected more severe consequences from drinking excessively (Suls & Green, 2003). The perception and effect of the norm often depends upon how similar a person feels he or she is to the norm. For example, a study examining “self-other discrepancies” and norm perception found that

discrepancies varied significantly by gender (Carey, Borsari, Carey, & Maisto, 2006). This gender difference could be due to the fact that females drink in mixed-gender crowds often and drink less than males, making females feel a greater self-other discrepancy towards the norm (Orcutt, 1991; Rosenbluth, Nathan, & Lawson, 1978). Greater self-other discrepancies lead to norms being less salient for behavior (Baer & Carney, 1993; Larimer, Irvine, Kilmer, & Marlatt, 1997; Perkins & Berkowitz, 1986; Schroeder & Prentice, 1998).

The effects of alcohol norms also depend upon the type of norm (i.e., descriptive vs. injunctive). Descriptive norms are theorized to be a direct source of information that people use to guide behavior (Rimal & Real, 2005). Injunctive norms on the other hand are typically used to moderate the relationship between descriptive norms and behavior (Borsari & Carey, 2003; Real & Rimal, 2007; Rimal & Real, 2005). Therefore, while descriptive norms provide information on how people act, injunctive norms provide specific information about how important the behavior in question is. For example, a student may think the average peer consumes two drinks at social occasions (descriptive norm), but if they simultaneously perceive attitudes to be relaxed (injunctive norm) then they may not feel as pressured to conform to the norm. Statistically, several studies have failed to find significant correlations between injunctive norms and alcohol use. Real and Remal (2005) have suggested that measurements of injunctive norms need to be improved (Real & Rimal, 2007).

### **Using Social Norms to Change Drinking Habits**

This established “social norms approach” has been used practically as an attempt to decrease excessive drinking in college. If perceptions of norms correlate with drinking behavior, then correcting students’ misperceptions should lower rates of drinking. Results of social norms campaigns have been mixed (Haines & Spear, 1996; Werch et al., 2000).

The first social norms campaign, at Northern Illinois University, reported successful results (Haines & Barker, 2003). In this study, an intensive social norms campaign was introduced including print media and monetary incentives. Students were offered rewards for noticing the media and reporting corrected norms. Over a 10 year period, the study found significant decreases in perceptions of alcohol norms, personal alcohol use, and alcohol related injuries (Haines & Barker, 2003). In a more recent study, print media and other “interactive” methods were used to correct students’ misperceptions of descriptive norms. This normative-intervention was employed for five weeks. At the end of the study, pre-post measures of alcohol use and perceptions of alcohol use were compared and revealed significant reductions in alcohol use and perceptions of alcohol use (Mattern & Neighbors, 2004).

Despite the prevalence of promising results, other campaigns have had much less success. It has been suggested that some of the studies reporting successful social norms campaigns, could be affected by poor research design (ex., lack of control groups), and measurement bias (i.e., the Rosenthal effect) (Rosenthal, 1966; Wechsler et al., 2003). One study that had a control group and an experiment group found no significant differences between the groups after the experimental group underwent a traditional social norms intervention (Werch et al., 2000). Another campaign reported decreases in social norms perceptions but no decreases in related alcohol usage (Clapp, Lange, Russel, Shillington, & Voas, 2003). An analysis of the data from the Harvard School of Public Health College Alcohol Study examined levels of alcohol use at schools employing social-norms campaigns and found no significant decreases in usage (Wechsler et al., 2003).

### **Recent Research and the Current Study**

Given the mixed results of social norms campaigns, recent research has re-evaluated the theoretical model underlying the social norms approach. The majority of previous studies utilized cross-sectional data, which did not allow for testing directions of effects (Borsari & Carey, 2003; Cullum, Armeli, & Tennen, 2010). More recent studies have utilized longitudinal designs, which allow for testing the directional relationship between social norms perceptions and alcohol use. However, these studies are still the minority (Cullum et al., 2010; Neighbors et al., 2006; Wardell & Read, 2013). In a three-year longitudinal study utilizing structural equation modeling, significant effects were found for both directions of influence; interestingly, the study found a significant and stronger effect between prior drinking and later social norms perceptions. Other studies have suggested the relative stability of social norms perceptions while simultaneously confirming the mutual influence model (Neighbors et al., 2006). These studies do not undermine previous theories about alcohol social norms perceptions and their effect on alcohol behavior. These recent longitudinal studies, along with the very few earlier longitudinal studies, confirm that social norms perceptions affect behavior (Cullum et al., 2010; Gerrard, Gibbons, Benthin, & Hessling, 1996; Marks, Graham, & Hansen, 1992). More importantly, the reciprocal effects suggest a more dynamic relationship between social norms perceptions and alcohol use (Cullum et al., 2010).

The present study utilized a longitudinal design and latent growth curve modeling in order to supplement more recent social norms research. The latent growth curve approach (which no other studies have utilized) allowed for modeling of underlying growth trends in alcohol use. Further, the reciprocal relationship between social norms perceptions and alcohol use were tested. Finally, more broad ranging effects of alcohol use were assessed by adding educational

and behavioral outcomes to the model. It was expected that (a) initial social norms perceptions would relate to changes in alcohol use; (b) initial alcohol use and changes in alcohol use would relate to later social norms perceptions, and finally (c) alcohol use would be related to academic achievement and misconduct.

## **Method**

### **Participants**

All 3,833 incoming first-year students were recruited during summer orientation from the University of North Carolina at Chapel Hill prior to the 2008-2009 school year. For reasons relating to consent, only 2,925 were eligible to participate (i.e., 18 years or older). Surveys were collected from 1,625 students and 1,525 of those were valid (51.7% of the eligible population; 39.4% of the total population; 61.9% female; 74.8% Caucasian; 9.6% African American). The sample was generally representative of the entire incoming freshman class. During the fall semester of the same year, the original 1,525 participants were recruited for an online follow-up survey; 1040 accessed the survey and 809 students returned the survey with valid data (53.5% retention; 21.1% of the total population; 65.5% female; 73.7% Caucasian; 8.9% African American). Attrition analysis for risky alcohol use showed that those who followed up ( $M = 1.60$ ,  $SD = .75$ ) had lower scores than those who failed to follow up ( $M = 1.71$ ,  $SD = .84$ );  $t(1523) = 2.64$ ,  $p < .01$ . Finally, participants were recruited for a second online follow-up assessment during the spring semester of their fourth year in college. For this third assessment, 448 students opened the survey and 416 students completed the survey (27.3% retention from baseline; 10.9% of the total population; 69.9% female; 71.9% Caucasian; 8.5% African American). Attritional analysis for risky alcohol use revealed that those who followed up ( $M =$

1.50, SD = .68) had lower scores than those who did not follow up ( $M = 1.71$ , SD = .83);  $t(1523) = 4.66$ ,  $p < .001$ .

Due to high rates of attrition and some missing data, two criteria were used to establish the final sample. First, participants must have completed the alcohol questionnaire for at least two time points (i.e., they must have participated at either Time 2 or Time 3). Of the original 1525 participants, 591 did not complete either of the follow-up assessments; these 591 were excluded from the analysis leaving 934 (648 completed two time points and 286 completed all time points). Second, given that our analysis involved testing gender effects, the 45 participants who had not specified gender were excluded; the final sample consisted of the 889 participants who had completed surveys before college and at least once during college (58.3% of baseline; 23.2% of total population; 64.8% female; 74.1% Caucasian; 9.0% African American). Attrition analyses for risky alcohol use revealed that the final sample ( $M = 1.59$ ; SD = .74) had lower scores than those who were excluded ( $M = 1.74$ ; SD = .85);  $t(1523) = 3.43$   $p < .001$ .

### **Procedure**

Participants first were recruited during their freshman summer orientation. Summer orientation is required of all first-year students, making it an opportune time to recruit a representative sample. In a private area, away from their parents, participants provided informed consent, and then filled out the survey assessing demographics, personal drinking behavior, personal perceptions of drinking norms, health related behaviors such as smoking tobacco, and college expectations. Four months post baseline, all original participants were contacted to complete a follow-up assessment with similar measures on Survey Monkey. Four years post-baseline, students were contacted again through email and recruited to participate in a follow-up questionnaire also on Survey Monkey. The final survey contained the same measures as the first

and second assessments with the addition of assessments of academic achievement and behavioral problems. All procedures were reviewed and approved by the Institutional Review Board.

## Measures

*Risky alcohol use.* Risky alcohol use was measured with a five-item questionnaire. The questionnaire assessed frequency of alcohol consumption, frequency of binge drinking, and the frequency of risky alcohol related consequences (hangovers, sickness, and unwanted sexual situations). Questionnaire items were based on a likert-scale from 1 to 5 (1 = 0 times; 2 = 1-2 times; 3 = 3-5 times; 4 = 6-9 times; 5 = 10 or more times). The alcohol questionnaire was assessed at all three time points. At the first and third time points, the questions asked about the past six months. The Time 2 survey contained a slight variation, which asked about the past two months (this was due to the temporal proximity of the first two assessments). A composite variable was created for alcohol use at each time point ( $\alpha > .81$  for all time points). Higher scores corresponded to higher rates of risky alcohol use.

*Descriptive norms perception.* Descriptive norms perceptions were assessed using almost identical likert-scale questions as the risky alcohol use questionnaire. Instead of addressing personal use, participants were asked to estimate the behavior of the “typical UNC student.” Descriptive norms only were assessed at the first and third time points. Composite scores were computed and internal consistency was .77 or above for both time points.

*Academic Achievement:* Academic achievement was assessed through cumulative college GPA, as measured by self-report on a 4.0-scale. Participants reported their cumulative GPA at the third time point, providing an indication of their overall college academic performance.

*Misconduct:* Misconduct was assessed in four categories: alcohol related misconduct with law enforcement, alcohol related misconduct with UNC administration, other misconduct with law enforcement, and other misconduct with UNC administration. Due to low rates of reported misconduct, a binary variable was created; participants with *any* misconduct in the aforementioned categories were given a score of one, and all other participants were given a score of zero.

### **Data Analysis**

Three sets of analysis were performed to examine the study's hypotheses. First, descriptive statistics (means and standard deviations) and t-tests were employed to examine the study variables and gender differences over the four-year timespan. Correlation analyses were used to gauge relationships among the primary study variables. Second, in order to test the longitudinal changes in alcohol use, an unconditional growth model using latent curve analysis was examined. The use of latent curves allows for the estimation of slopes and intercepts while simultaneously maintaining the ability to test for individual growth trajectories. Latent growth analysis also has a distinct advantage over hierarchical regression because it provides the ability to test model fit with several different indicators (Bollen & Curran, 2006). Additionally, given that data were missing, this approach allowed for the estimation of slopes and intercepts of individuals with incomplete data. All latent curve analyses were performed with AMOS 21.0

For the current analysis, a linear growth trajectory was modeled. As a general rule, in order to test a relationship of polynomial of degree  $d$ , it is necessary to have a minimum of  $d+2$  repeated observations (i.e., linear relationships are polynomials of degree 1 and testing linear relationships requires three repeated observations) (Bollen & Curran, 2006). The initial model estimated the latent slopes and intercepts from risky alcohol use as observed indicators at all



three time points. Path weights between the latent intercept and all observed indicators were set to one. Path weights between the latent slope factor and each observed indicator were set to 0 and 1 for the first and third time points respectively; the path between the latent slope factor and Time 2 risky alcohol use was allowed to freely vary. A multi-group model (by gender) was utilized to allow the latent slope and latent intercept factors to freely vary between genders.

By building upon the initial unconditional model, the study hypotheses were tested by using a multi-group conditional latent growth curve model. Descriptive norms perceptions from high school were added as observed exogenous predictors of the latent slope factor and the latent intercept factor. After adding norms perceptions from high school, descriptive norms from Time 3, academic achievement, and misconduct were added as observed endogenous outcomes in order to understand how the intercept and slope related to these outcomes (see Figure 1).

## **Results**

### **Descriptive Statistics**

Table 1 reports means, standard deviations, and tests of gender differences among the primary study variables. Males scored higher than females on the risky alcohol use consistently across all time points, as expected. There were no gender effects for the perceptions of descriptive norms during the first or third time point. At the first time point, 44% of the participants had not consumed any alcohol and had not experienced any risky alcohol use side effects (hangover, sickness, etc.) in the six months prior to participating. By the last assessment, the percentage had dropped to 6%. Finally, 10% of participants had experienced misconduct.

Correlations revealed expected relationships between study variables (See Table 2). Alcohol use was correlated across all time points for males and females. Descriptive norms perceptions at Time 1 and Time 3 were correlated with risky alcohol use at the corresponding

time point for both males and females. Further, initial descriptive norms perceptions were correlated with risky alcohol use at later time points for both males and females. Misconduct was mildly correlated with initial alcohol use and initial descriptive norms perceptions for females. For males, this trend was only found between alcohol use and misconduct.

### **Risky Alcohol Use over Time**

The analysis of unconditional growth curve model began by estimating the latent slope and latent intercept of the risky alcohol use from baseline, Time 1, and Time 2. A multi-group model by gender was used. Parameters were systematically allowed to be fixed across gender or to freely vary.  $\Delta\chi^2$  difference tests were used to determine which parameters could freely vary; results suggested that the variance around the error terms for each of the three risky alcohol use measures varied significantly across time and gender. The model fit approached adequate,  $\chi^2(8) = 60.03$ ,  $p < .001$ ;  $\chi^2/df = 6.00$ ; CFI = .92; RMSEA = .07. The estimated slope factor for both males and females ( $M = .79$ ,  $p < .001$ ; variance = .21,  $p < .001$ ) suggested that risky alcohol use was increasing from high school to the fourth year of college. The estimated intercept factor was significantly greater than zero ( $M = 1.59$ ,  $p < .001$ ; variance = .35,  $p < .001$ ). For males, the estimated unstandardized path weight for risky alcohol use at Time 2 on the slope factor was  $-.06$ ,  $p = .18$ , and for females  $-.03$ ,  $p = .27$ .

A multi-group conditional model was then tested by adding Time 1 descriptive norms perceptions as observed exogenous predictors of the latent slope factor and latent intercept factor. Additionally, descriptive norms from Time 3, academic achievement, and misconduct were all added as observed outcomes. Gender interactions were examined by fixing paths or by allowing paths to freely vary by gender.  $\Delta\chi^2$  difference tests were used to examine changes in model fit for each path. Nine paths were constrained without significant detriment in model fit.

Three paths remained unconstrained across gender: the paths between descriptive norms perceptions at Time 1 and the intercept factor, the intercept factor and academic achievement, and descriptive norms perceptions at Time 1 and academic achievement. The final model was a good fit,  $\chi^2(36) = 85.95$ ,  $p < .0001$ ;  $\chi^2/df = 2.39$ ; CFI = .94; RMSEA = .04.

### **Relationship Between Norms Perceptions and Alcohol Use**

Table 3 reports the unstandardized path weights for the final multi-group conditional model. Descriptive norms perceptions at Time 1 were significantly related to the latent intercept factor for both males and females such that perceiving higher rates of alcohol use for UNC students at Time 1 predicted higher rates of initial risky alcohol use. The slope and intercept factors were then related to descriptive norms at the third assessment equally for males and females. Higher levels of baseline alcohol use (i.e., intercept) related to increases in social norms perceptions longitudinally; similarly, higher rates of change in risky alcohol use (i.e., slope) predicted higher perceptions of social norms perceptions. Together these three paths suggest a reciprocal relationship between risky alcohol use and descriptive norms perceptions.

### **Academic Achievement and Misconduct**

Descriptive norms perceptions from baseline were associated with academic achievement for both males and females. Higher social norms predicted lower academic achievement for males; the opposite was true for females. Finally, higher levels of baseline risky alcohol use predicted lower academic achievement (for females only) and higher likelihood of having misconduct.

## **Discussion**

Decades of research have been devoted to understanding alcohol culture on college campuses across the United States. In order to effect change on the rates of risky alcohol use

across college campuses, the social norms approach has become widely-used (Borsari & Carey, 2003). Few empirical studies have assessed the effectiveness of these campaigns, and some campaigns have reported no success at all (Cullum et al., 2010). The future success of interventions that lower rates of risky alcohol use depends upon thoroughly understanding the mechanisms that affect alcohol use. A solid theoretical understanding will aid in creating effective interventions that target critical time periods and high risk populations in a cost-effective manner.

Few studies have used longitudinal designs to understand the reciprocal relationship between social norms perceptions and alcohol use. This study confirmed both directions of influence. Social norms perceptions were associated with initial levels of alcohol use. Perhaps more importantly, initial levels of risky alcohol use and changes in risky alcohol use were associated with later social norms perceptions. The exact reason for this relationship is not clear; however, it has been suggested that dissonance reduction and selective affiliation explain the effects of alcohol use on social norms perceptions (Cullum et al., 2010). Gerrard et al. (1996) found that when individuals engage in risky behaviors they are more likely to project those behaviors onto others in order to normalize their behavior and experience less dissonance (Festinger, 1957; Marks et al., 1992). Selective affiliation suggests that people gravitate to individuals with similar behaviors and attitudes as themselves (Read, Wood, & Capone, 2005; Reifman, Watson, & McCourt, 2006; Rosenbaum, 1986). Over time, by associating with people who drink similar amounts, perceptions and generalizations would become similar to their own. Neither this study nor previous studies have been able to test either process specifically. Future studies should investigate the distinct roles of dissonance reduction and selective affiliation in understanding this association.

It was expected that baseline social norms perceptions would also be related to changes in alcohol use, but the results did not support this hypothesis. The lack of findings could be due to a variety of explanations. The ability of latent growth models to predict differences in slopes relies on individual variability around the slope. The variance around the latent slope factor was relatively small suggesting that, over a four-year period, individual changes in risky alcohol are considerably uniform (i.e., each individual changes at a similar rate). A better explanation might be that as social norms perceptions change over time, more recent social norms are relevant and initial social norms become less relevant. This explanation is supported by the findings of Cullum et al. (2010) who utilized structural equation modeling to show that the previous year's social norms perceptions had a consistent effect on the next years alcohol use. The latent growth curve model employed in this study was unable to account for changes of social norms perceptions as a predictor. This effect could be examined in future studies by employing a multivariate latent growth curve model in which latent slope and latent intercept factors are estimated for both alcohol use and social norms perceptions.

The lack of findings regarding changes in risky alcohol use could also be due to the linear estimation of growth in risky alcohol use. This study was not able to examine non-linear growth trajectories, but alcohol use most likely changes in different rates throughout college. Berkowitz and Perkins (1987) reported that the transition to college provokes the greatest changes in alcohol use in relation to other years in college. Similarly, others have concluded that students' alcohol use may vary significantly throughout a semester depending upon tests, holidays, or other specific occasions (Del Boca, Darkes, Greenbaum, & Goldman, 2004; Greenbaum, Del Boca, Darkes, Wang, & Goldman, 2005; Neighbors et al., 2006). These findings suggest non-linear growth in alcohol use. Future studies could build upon the latent growth curve model by

examining non-linear trends, which may illuminate critical periods around entry into college or turning 21 (Berkowitz & Perkins, 1987; Day-Cameron, Muse, Hauenstein, Simmons, & Correia, 2009).

The last prediction that alcohol use would relate to both academic achievement and misconduct was only partially supported. Initial levels of alcohol use appear to be a factor, but changes in alcohol use were not related to either outcome. The connection between baseline alcohol use and misconduct is most likely explained by an underlying deviancy tendency. Individuals who participate in higher levels of risky alcohol at an earlier age are more likely to be generally deviant. Finally, baseline social norms perceptions appear to be related to academic achievement. This effect has not been found in previous studies and was not originally predicted. An explanation is not readily accessible, especially when accounting for opposite effects between males and females. One explanation could be that perceptions of alcohol social norms are related to general expectations for college. In other words, students who perceive higher drinking norms could be influenced to think about college as a party experience and less of an academic experience. Unfortunately, this explanation does little to clarify why females who perceive higher norms tend to have higher academic achievement. Another explanation could be that females who perceive higher norms are also more likely to react contrary to the norm as a protective measure (i.e., they focus on academics in order to avoid being influenced by the norm). This relationship should be explored further in future studies.

There were limitations to this study which future research can improve upon. Three time periods were sufficient to model growth in alcohol use, but the time lapse between assessments left several years without assessments. In order to model non-linear growth and obtain more accurate trajectories, future studies should use shorter and more consistent time intervals. Next,

the risky alcohol use questionnaire had a high internal consistency over time, but other alcohol related questionnaires may be more reliable. The questionnaire assessed frequency of behavior over a long period of time (six-months or three months). Longer recall periods can lead to heuristic biases that skew self-report (Robinson & Clore, 2002). Further, the questionnaire differed in the recall period assessed at Time 2; future studies should use a consistent recall period and consider other questionnaires such as the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). Attrition was another limitation to the findings in the study. Students who participated after the baseline assessment had lower baseline levels of risky alcohol use, and the gender ratio became more skewed with time. Findings may be limited to students with lower levels of risky alcohol use than the general population. Future studies should consider strategies to limit attrition, especially among students with higher levels of alcohol use.

In conclusion, this study supplements recent longitudinal research of alcohol use and social norms perceptions, by utilizing a different statistical approach. The results confirm the mutual relationship between norms perceptions and alcohol use, while also suggesting implications of alcohol use on academic achievement. The latent growth curve employed in this study should be built upon in future research; the procedure may be an effective way to understand underlying longitudinal trends in alcohol use. Findings about initial levels of alcohol use and social norms perceptions suggest that interventions should happen before college. Finally, the latent growth model approach should be used in future studies to identify factors that predict changes in alcohol use over time. These factors, which affect trajectories, will be the most important when designing interventions with lasting effects.

## References

- Baer, J. S., & Carney, M. M. (1993). Biases in the perceptions of the consequences of alcohol use among college students. *Journal of Studies on Alcohol*, 54(1), 54–60.
- Berkowitz, A. D., & Perkins, H. W. (1987). Recent research on gender differences in collegiate alcohol use. *Journal of American College Health*, 36(2), 123–129.
- Blane, H., & Hewitt, L. E. (1977). *Alcohol and youth : an analysis of the literature, 1960-75*. Rockville, Md.: National Institute on Alcohol Abuse and Alcoholism ; Springfield, Va. : available from National Technical Information Service.
- Bollen, K. A., & Curran, P. J. (2006). *Latent Curve Models: A Structural Equation Perspective*. Wiley.
- Bonar, E. E., Young, K. M., Hoffmann, E., Gumber, S., Cummings, J. P., Pavlick, M., & Rosenberg, H. (2012). Quantitative and qualitative assessment of university students' definitions of binge drinking. *Psychology of Addictive Behaviors*, 26(2), 187–193.
- Borsari, B., & Carey, K. B. (2003). Descriptive and Injunctive Norms in College Drinking: A Meta-Analytic Integration. *Journal of Studies on Alcohol*, 64(3), 331–341.
- Brown, B. B., Bakken, J. P., Ameringer, S. W., & Mahon, S. D. (2008). A comprehensive conceptualization of the peer influence process in adolescence. In M. J. Prinstein & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents*. (pp. 17–44). New York, NY US: Guilford Press.
- Carey, K. B., Borsari, B., Carey, M. P., & Maisto, S. A. (2006). Patterns and importance of self-other differences in college drinking norms. *Psychology of Addictive Behaviors*, 20(4), 385–393.



- Cialdini, R. B. (2012). The focus theory of normative conduct. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology (Vol 2)*. (pp. 295–312). Thousand Oaks, CA: Sage Publications Ltd.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58(6), 1015–1026.
- Clapp, J. D., Lange, J. E., Russel, C., Shillington, A., & Voas, R. B. (2003). A failed norms social marketing campaign. *Journal of Studies on Alcohol*, 64(3), 409–414.
- Collins, R. L., Parks, G. A., & Marlatt, G. A. (1985). Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology*, 53(2), 189–200.
- Cullum, J., Armeli, S., & Tennen, H. (2010). Drinking norm–behavior association over time using retrospective and daily measures. *Journal of Studies on Alcohol and Drugs*, 71(5), 769–777.
- Day-Cameron, J. M., Muse, L., Hauenstein, J., Simmons, L., & Correia, C. J. (2009). Alcohol use by undergraduate students on their 21st birthday: Predictors of actual consumption, anticipated consumption, and normative beliefs. *Psychology of Addictive Behaviors*, 23(4), 695–701.
- Del Boca, F. K., Darkes, J., Greenbaum, P. E., & Goldman, M. S. (2004). Up Close and Personal: Temporal Variability in the Drinking of Individual College Students During Their First Year. *Journal of Consulting and Clinical Psychology*, 72(2), 155–164.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford University Press.

- Gerrard, M., Gibbons, F. X., Benthin, A. C., & Hessling, R. M. (1996). A longitudinal study of the reciprocal nature of risk behaviors and cognitions in adolescents: What you do shapes what you think, and vice versa. *Health Psychology, 15*(5), 344–354.
- Grant, J. D., Agrawal, A., Bucholz, K. K., Madden, P. A. F., Pergadia, M. L., Nelson, E. C., ... Heath, A. C. (2009). Alcohol Consumption Indices of Genetic Risk for Alcohol Dependence. *Biological Psychiatry, 66*(8), 795–800.
- Greenbaum, P. E., Del Boca, F. K., Darkes, J., Wang, C.-P., & Goldman, M. S. (2005). Variation in the Drinking Trajectories of Freshmen College Students. *Journal of Consulting and Clinical Psychology, 73*(2), 229–238.
- Haines, M. P., & Barker, G. P. (2003). The Northern Illinois University experiment: A longitudinal case study of the social norms approach. In H. Wesley Perkins (Ed.), *The social norms approach to preventing school and college age substance abuse: A handbook for educators, counselors, and clinicians*. (pp. 21–34). San Francisco, CA US: Jossey-Bass.
- Haines, M., & Spear, S. F. (1996). Changing the perception of the norm: A strategy to decrease binge drinking among college students. *Journal of American College Health, 45*(3), 134–140.
- Jones, E. E., & Harris, V. A. (1967). The attribution of attitudes. *Journal of Experimental Social Psychology, 3*(1), 1–24.
- Larimer, M. E., Irvine, D. L., Kilmer, J. R., & Marlatt, G. A. (1997). College drinking and the Greek system: Examining the role of perceived norms for high-risk behavior. *Journal of College Student Development, 38*(6), 587–598.

- Lo, C. C. (1995). Gender differences in collegiate alcohol abuse. *Journal of Drug Issues*, 25(4), 817–836.
- Maggs, J. L., Patrick, M. E., & Feinstein, L. (2008). Childhood and adolescent predictors of alcohol use and problems in adolescence and adulthood in the National Child Development Study. *Addiction*, 103(s1), 7–22.
- Marks, G., Graham, J. W., & Hansen, W. B. (1992). Social projection and social conformity in adolescent alcohol use: A longitudinal analysis. *Personality and Social Psychology Bulletin*, 18(1), 96–101.
- Mattern, J. L., & Neighbors, C. (2004). Social norms campaigns: examining the relationship between changes in perceived norms and changes in drinking levels. *Journal of studies on alcohol*, 65(4), 489–493.
- Miller, D. T., & McFarland, C. (1991). When social comparison goes awry: The case of pluralistic ignorance. In J. Suls & T. A. Wills (Eds.), *Social comparison: Contemporary theory and research*. (pp. 287–313). Hillsdale, NJ England: Lawrence Erlbaum Associates, Inc.
- Miller, D. T., & Prentice, D. A. (1996). The construction of social norms and standards. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles*. (pp. 799–829). New York, NY US: Guilford Press.
- Musgrave-Marquart, D., Bromley, S. P., & Dalley, M. B. (1997). Personality, academic attribution, and substance use as predictors of academic achievement in college students. *Journal of Social Behavior & Personality*, 12(2), 501–511.

- National Institute on Alcohol Abuse and Alcoholism. (2007, November). What Colleges Need to Know Now An Update on College Drinking Research. National Institute of Health (NIH).
- Neighbors, C., Dillard, A. J., Lewis, M. A., Bergstrom, R. L., & Neil, T. A. (2006). Normative Misperceptions and Temporal Precedence of Perceived Norms and Drinking. *Journal of studies on alcohol*, 67(2), 290–299.
- Nisbett, R. E., & Kunda, Z. (1985). Perception of social distributions. *Journal of Personality and Social Psychology*, 48(2), 297–311.
- O'Malley, P. M., & Johnston, L. D. (2002). Epidemiology of Alcohol and Other Drug Use among American College Students\*. *Journal of Studies on Alcohol, Supplement No. 14*, 23–39.
- Orcutt, J. D. (1991). The social integration of beers and peers: Situational contingencies in drinking and intoxication. In D. J. Pittman & H. R. White (Eds.), *Society, culture, and drinking patterns reexamined*. (pp. 198–215). Piscataway, NJ US: Rutgers Center of Alcohol Studies.
- Perkins, H Wesley. (2002). Surveying the damage: a review of research on consequences of alcohol misuse in college populations. *Journal of studies on alcohol. Supplement*, (14), 91–100.
- Perkins, H. (2003). *The social norms approach to preventing school and college age substance abuse : a handbook for educators, counselors, and clinicians* (1st ed.). San Francisco: Jossey-Bass.

- Perkins, H. W., & Berkowitz, A. D. (1986). Perceiving the Community Norms of Alcohol Use among Students: Some Research Implications for Campus Alcohol Education Programming\*. *Substance Use & Misuse*, 21(9-10), 961–976.
- Perkins, H. Wesley. (1997). College Student Misperceptions of Alcohol and other Drug Norms Among Peers: Exploring Causes, Consequences, and Implications for Prevention Programs. In *Designing Alcohol and Other Drug Prevention Programs in Higher Education: Bringing Theory into Practice*. Newton, Mass: Higher Education Center for Alcohol and Other Drug Prevention, U.S. Department of Education.
- Perkins, H. Wesley, Haines, M. P., & Rice, R. (2005). Misperceiving the College Drinking Norm and Related Problems: A Nationwide Study of Exposure to Prevention Information, Perceived Norms and Student Alcohol Misuse. *Journal of Studies on Alcohol*, 66(4), 470–478.
- Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of personality and social psychology*, 64(2), 243.
- Prentice, Deborah A. (2008). Mobilizing and weakening peer influence as mechanisms for changing behavior: Implications for alcohol intervention programs. In M. J. Prinstein & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents*. (pp. 161–180). New York, NY US: Guilford Press.
- Presley, C. A., & Pimentel, E. R. (2006). The Introduction of the Heavy and Frequent Drinker: A Proposed Classification to Increase Accuracy of Alcohol Assessments in Postsecondary Educational Settings. *Journal of Studies on Alcohol*, 67(2), 324–331.

- Read, J. P., Wood, M. D., & Capone, C. (2005). A Prospective Investigation of Relations between Social Influences and Alcohol Involvement during the Transition into College. *Journal of Studies on Alcohol*, 66(1), 23–34.
- Real, K., & Rimal, R. N. (2007). Friends talk to friends about drinking: Exploring the role of peer communication in the theory of normative social behavior. *Health communication*, 22(2), 169–180.
- Reifman, A., Watson, W. K., & McCourt, A. (2006). Social Networks and College Drinking: Probing Processes of Social Influence and Selection. *Personality and Social Psychology Bulletin*, 32(6), 820–832.
- Rimal, R. N., & Real, K. (2005). How Behaviors are Influenced by Perceived Norms: A Test of the Theory of Normative Social Behavior. *Communication Research*, 32(3), 389–414.
- Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: Evidence for an accessibility model of emotional self-report. *Psychological Bulletin*, 128(6), 934–960.
- Rosenbaum, M. E. (1986). The repulsion hypothesis: On the nondevelopment of relationships. *Journal of Personality and Social Psychology*, 51(6), 1156–1166.
- Rosenbluth, J., Nathan, P. E., & Lawson, D. M. (1978). Environmental influences on drinking by college students in a college pub: Behavioral observation in the natural environment. *Addictive Behaviors*, 3(2), 117–121.
- Rosenthal, R. (1966). *Experimenter Effects in Behavioral Research*. East Norwalk, CT US: Appleton-Century-Crofts.
- Schroeder, C. M., & Prentice, D. A. (1998). Exposing Pluralistic Ignorance to Reduce Alcohol Use Among College Students<sup>1</sup>. *Journal of Applied Social Psychology*, 28(23), 2150–2180.

- Singleton, R. A. J. (2007). Collegiate alcohol consumption and academic performance. *Journal of Studies on Alcohol and Drugs*, 68(4), 548–555.
- Straus, R., & Bacon, S. D. (1953). *Drinking in college*. New Haven, CT US: Yale University Press.
- Suls, J., & Green, P. (2003). Pluralistic ignorance and college student perceptions of gender-specific alcohol norms. *Health Psychology*, 22(5), 479–486.
- Wardell, J. D., & Read, J. P. (2013). Alcohol expectancies, perceived norms, and drinking behavior among college students: Examining the reciprocal determinism hypothesis. *Psychology of Addictive Behaviors*, 27(1), 191–196.
- Wechsler, H., & Nelson, T. F. (2008). What we have learned from the Harvard School of Public Health College Alcohol Study: Focusing attention on college student alcohol consumption and the environmental conditions that promote it. *Journal of Studies on Alcohol and Drugs*, 69(4), 481.
- Wechsler, H., Nelson, T. F., Lee, J. E., Seibring, M., Lewis, C., Keeling, R. P., & others. (2003). Perception and reality: A national evaluation of social norms marketing interventions to reduce college students' heavy alcohol use. *Journal of Studies on Alcohol*, 64(4), 484–494.
- Werch, C. E., Pappas, D. M., Carlson, J. M., DiClemente, C. C., Chally, P. S., & Sinder, J. A. (2000). Results of a social norm intervention to prevent binge drinking among first-year residential college students. *Journal of American College Health*, 49(2), 85–92.

Table 1.

*Means (Standard Deviations) and Tests of Gender Differences for Primary Study Variables*

Measure	Total	Males	Females	Statistic
Time 1, N	863	304	559	
Alcohol Use	1.59 (.74)	1.73 (.81)	1.53 (.70)	$t(549.7)^a = 3.70^{***}$
Descriptive Norms	2.86 (.72)	2.81 (.75)	2.89 (.70)	$t(861) = 1.53$ , NS
Time 2, N	776	268	508	
Alcohol Use	1.55 (.68)	1.63 (.70)	1.51 (.66)	$t(516.6)^a = 2.32^*$
Time 3, N	370	112	258	
Alcohol Use	2.31 (.79)	2.51 (.83)	2.25 (.76)	$t(368) = 2.89^{**}$
Descriptive Norms	3.12 (.59)	3.01 (.63)	3.17 (.57)	$t(368) = 2.35^*$
Academic Achievement	3.36 (.38)	3.33 (.43)	3.37 (.35)	$t(368) = 0.92$ , NS
Trouble, N (%)	38 (10.3)	13 (11.6)	25 (9.7)	$\chi^2(1) = .12$ , NS

<sup>a</sup> Equal variances not assumed.\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$



Table 2.

*Pearson Correlations among Primary Study Variables by Gender (Boys above the diagonal, girls below)*

	Time 1		Time 2	Time 3			
	1.	2.	3.	4.	5.	6.	7.
Time 1							
1. Alcohol Use	--	.47***	.67***	.48***	.16	-.06	.30**
2. Descriptive norms	.36***	--	.28***	.40***	.17	-.20*	.15
Time 2							
3. Alcohol Use	.71***	.31***	--	.51***	.10	.22	.04
Time 3							
4. Alcohol Use	.48***	.17**	.57***	--	.44***	-.01	.20*
5. Descriptive Norms	.11	.14*	.18**	.31***	--	-.03	.08
6. Academic Achievement	-.10	.10	-.08	-.06	-.02	--	
7. Trouble	.13*	.15*	.14	.02	-.10	-.08	--

\*  $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Table 3.

*Prediction of Risky Alcohol Use, Descriptive Norms Perceptions, Academic Achievement, and Misconduct; Unstandardized Regression Weights for Males (Females)*

	Risky Alcohol Use		Outcomes		
	Intercept	Slope	DNP <sup>a</sup> Time 3	Academic Achievement	Misconduct
DNP <sup>a</sup> Time 1	.39 (.32)***	-.04 (-.04) <sup>b</sup>	.08 (.08) <sup>b</sup>	-.13 (.08)*	.03 (.03) <sup>b</sup>
Intercept		-.03 (-.03) <sup>b</sup>	.20 (.20) <sup>b***</sup>	.06 (-.11*)	.10 (.10) <sup>2**</sup>
Slope			.54 (.54) <sup>b***</sup>	.03 (.03) <sup>b</sup>	-.08 (-.08) <sup>b</sup>

<sup>a</sup> Descriptive norms perceptions.

<sup>b</sup> Path constrained across gender.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Figure 1.

*Final Multi-Group Conditional Latent Growth Curve Model Displaying Significant Paths*

