

## Do friends always help your studies? Mediating processes between social relations and academic motivation

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**Abstract** Previous studies suggest that social relations can increase one's motivation to learn in school. However, other evidence showed that having more friends may also distract from one's academic involvement. To understand the mechanisms behind this apparent contradiction, this study identified and tested the effects of a potentially important positive and negative mediator between social relations and academic motivation. A total of 226 university students were used to test the hypothesized path model. Results showed that the impact of social relations on students' academic motivation was negatively mediated by alcohol use, but positively mediated by their place attachment to the university, although the model fit differed for women and men. Implications for social relations, school policy and freshman orientation programs are discussed.

**Keywords** Academic motivation · School belongingness · University · Alcohol use · College drinking · Social relations · Place attachment

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## 1 Introduction

Theory and research on social relations suggest that the well-being, behaviors and motivations of an individual can be affected by one's social relations (Cheng 1997; Fiske 1992; Schmitz and Crystal 2006; Wentzel 1998). However, are these effects of social relations always beneficial? When can social relations be harmful? What are the mechanisms behind social relations and behavioral or motivational outcomes? To further look into these questions, the present study examines the positive and negative effects of social relations in a college student sample. Since students' learning often occurs in a social group setting, it is likely to be affected by the social relations they experience in school. There is evidence that positive social relations are important in increasing academic motivation (Anderman and Anderman 1999; Buhs and Ladd 2001; Juvonen and Wentzel 1996; McDermott 1977; Ryan and Patrick 2001; Stage 1989; Welsh et al. 2001; Wentzel and Asher 1995; Wentzel and Caldwell 1997). However, the underlying explanation for why good social relations should be a positive predictor of academic interest or motivation is not well explained, especially in a college or university environment. Most of the supporting research has been based on middle school students (e.g., Anderman and Anderman 1999; Wentzel 1998; Wentzel and Caldwell 1997). However, it is important for practical as well as theoretical reasons to know if social relations do predict academic motivation in *college students* (Hoffman et al. 2002), especially in the university context, where high motivation is needed to develop independent learning and critical thinking (McMillan 1987). This study added to this literature by identifying possible positive and negative mediating processes between social relations and academic motivation in the context of university students.

### 1.1 Alcohol use as a negative mediator

One negative impact of social relations might be an increase in alcohol use in college students. Others have suggested that the relationship between students' social relations and activities, alcohol use, and academic motivation needs additional investigation (Igra and Moos 1979; McGee and Kypri 2004). There is evidence of a relationship between social interactions and alcohol use in college students. For example, Igra and Moos (1979), in their longitudinal study of more than 800 university students, found that the more students engaged in social activities, the more students drink. Perkins (2002) also argued that since university students usually have fewer contacts with parents, family and other groups, such as religious groups or a full-time job environment once they enter college, peer groups are the strongest factor affecting students' drinking behaviors. These peers often encourage alcohol use. In studying factors relating to college binge drinking, Wechsler et al. (1995) found that having more friends relates to higher odds of binge drinking in their large national university sample of over 17,000 students. In another study using more than 2,000 high school students, Hundley and Mercer (1987) found that having more friends and higher ratings of friends' interpersonal warmth and trust was related to higher alcohol use in the past six months. Therefore, it appears that students with stronger social relations are more likely to drink.

At the same time, there is evidence that alcohol use can affect academic motivation and performance. For example, [Scott et al. \(2004\)](#) found that more drinking predicted a lower grade point average (GPA). Using data from the 1993 Harvard College Alcohol Study, [Wolaver \(2002\)](#) found a significantly lower GPA for students who drank more heavily, even after controlling for other demographic data and personal characteristics. However, other research has not replicated these results. For example, [Paschall and Freisthler \(2003\)](#) found that heavy drinking did not predict students' GPA. As noted in their paper, one can argue that students who drink often may still manage to get good grades in exams, perhaps because of higher levels of ability or other factors than the efforts put into study. This logic is reflected in studies that found no relation between alcohol and academic performance after controlling for students' ability and high school grades (e.g., [Wood et al. 1997](#)). However, studies that look at different indicators for motivation for learning, instead of merely formal academic outcomes, found that alcohol use was related to students' academic motivation. For example, [McGee and Kypri \(2004\)](#), using nearly 2,000 students, found that in general, both male and female students who drink more show less motivation for school activities, such as being late for class, missing class, not concentrating, or failure to complete assignments. Therefore, alcohol appears to have a negative impact on students' motivation to learn and affects behaviors devoted to study.

The effects of alcohol may differ for women and men. [McGee and Kypri \(2004\)](#), mentioned above, also investigated gender differences and found that the impact of alcohol on motivation to learn was greater for men than for women. Similarly, [Webb et al. \(2007\)](#) found that alcohol use only significantly predicted lower academic motivation in males, but not in females. When looking at studies that examined predictors of alcohol use, gender differences were also identified, suggesting that the reasons for drinking could differ between men and women (e.g., [Gire 2002](#); [Stewart et al. 1996](#)). For example, studies suggested that more men than women drank because of social reasons (e.g. [Carrigan et al. 1998](#); [Simons et al. 2000](#)). These gender differences suggested that the mediating process proposed here should be stronger for men than for women. Given these possible gender differences, the current model is analyzed separately for women and men.

Combining the findings that better social relations are associated with higher alcohol use, and that higher use of alcohol relates to lower academic motivation, especially for men, it appears that alcohol use is a mediating variable between social relations and academic motivations. However, although research evidence mentioned above appeared to support alcohol use as a negative mediating process, research in general suggested a positive link between social relations and academic motivation. Therefore, with the negative association suggested by alcohol use, there should be another, and even stronger, positive mediating process that operates to support a positive relationship between social relations and academic interest and motivation.

## 1.2 Place attachment to university as a positive mediator

While alcohol use seems to make social relations detrimental to one's academic motivation, how can social relations benefit students' learning? One possibility could be a

feeling of belonging and attachment with the university, associated with positive social relationships. Such speculation can be supported by research showing that social relations inside and outside classrooms help students develop an attachment to school (France et al. 2010), and such attachment to school, in turn, may predict higher academic motivation (Bergin and Bergin 2009; Osterman 2000). In other words, attachment to school can be one of the important mediating processes between social relations and academic motivations. This feeling of belongingness or attachment to a place can be understood through a concept called *place attachment* (Low and Altman 1992).

### 1.2.1 Defining place attachment

There have been debates in environmental psychology on how to define place attachment, and a number of measures have been derived from these different definitions. Thus, there is no measure consistently used by researchers to assess place attachment. Two major definitions have been employed in the history of place attachment research. One of them defined place attachment as place identity and place dependence (e.g., Kyle et al. 2004; Semken and Freeman 2008; Todd and Anderson 2006; Williams and Roggenbuck 1989), while the other defined place attachment as emotional bonding (e.g., Hidalgo and Hernandez 2001; Lewicka 2005, 2008). Studies that adopted the first definition, defined place identity as “those dimensions of the self that define the individual’s personal identity in relation to the physical environment” (Proshansky 1978, p. 155) and place dependence as “the importance an individual attaches to the use of a particular recreation resource” (Jacob and Schreyer 1980, p. 373). Other researchers have accepted this two-part definition and developed measures of place attachment based on it (e.g., Kyle et al. 2004; Semken and Freeman 2008; Todd and Anderson 2006). For example, Williams and Roggenbuck (1989) developed a scale with 11 place dependence and 16 place identity items rated on 5-point Likert scales. Sample items for place dependence were “I enjoy doing the type of things here more than in any other area” and “I wouldn’t substitute any other area for doing the type of things I did here.” Sample items for place identity were “I find that a lot of my life is organized around this place” and “I feel like this place is part of me”. However, a problem with the above definitions and measures lies in a lack of differentiation of place attachment as distinct from place identity. Although these definitions and measures were commonly used in studies since the 1980s, recent literature raises doubts on whether place identity should be a sub-dimension of place attachment (e.g., Hernandez et al. 2007; Rollero and Piccoli 2010).

These concerns have led to another group of researchers defining place attachment as emotional bonding to a location. In arguing that place attachment should be a distinct concept and should be separated from place identity, Lewicka (2008) suggested that place attachment is the emotional bonding between people and place, while identity is ‘self categorization in terms of place’ (Lewicka 2008, p. 212). In other words, Lewicka was suggesting that place attachment is having positive feelings about a place; whereas place identity is the perception that the place is part of one’s own self. Thus, someone growing up in Pittsburgh might feel that Pittsburghness is a fundamental part of his or her self, but he or she might also dislike this part of himself or herself, and not feel a positive bonding toward Pittsburgh. Similarly, someone who just moves to

Pittsburgh may develop a positive bonding toward Pittsburgh, but he or she might not perceive Pittsburgh as part of his or her self. To measure place attachment according to this definition, Lewicka (2004) developed a scale measuring place attachment using 12 negatively framed and 12 positively framed items tapping participants' feelings toward a place. This was later reduced to a scale describing 9 positive and 3 negative feeling items (Lewicka 2006, 2008, 2010). Examples of positive items are 'I miss it when I am not here', and 'I know this place very well'. Examples of negative items are 'I don't like this place', and 'I leave this place with pleasure'. Negative items are reverse scored in this measure, as they are in other measures of place attachment. However, as we will mention in more detail below, we argue that place attachment does not only consist of affective, but also of behavioral and cognitive aspects. Focusing solely on the affective aspect of place attachment may not provide us with a measure that captures the full concept of place attachment.

The drawbacks of the two major definitions reviewed above may have affected the validity of the measures that have been developed. A better definition is, thus, needed to develop a clearer measure. In a recent paper, Scannell and Gifford (2010) defined place attachment not only as one's emotional feelings about a particular place, but also as the behaviors done to maintain contact with the place and as thoughts and memories about a place. The present study adopts Scannell and Gifford's (2010) more complete definition to further develop a new place attachment scale that included items measuring all of these aspects.

Place attachment research has shown strong evidence that social relations relate to one's attachment to a place (e.g., Pretty et al. 2003; Sampson 1988), which then affect one's attitudes and behaviors relating to the place (e.g. Kelly and Hosking 2008; Rollero and Piccoli 2010; Vorkinn and Riese 2001), suggesting place attachment as a mediator between social relations and different behavioral outcomes or motivational outcomes. Previous research successfully tested this mediating role of place attachment (measured based on this same Scannell and Gifford framework), identifying place attachment as a mediator between one's social relations and motivational outcomes in the context of migration intentions (Li and Frieze 2011). Thus, there is evidence that underlying place attachment can relate to other psychological factors and supports testing a similar theoretical model in the university context, with place attachment as a mediator between one's social relations and academic motivation.

### *1.2.2 Social relations and place attachment*

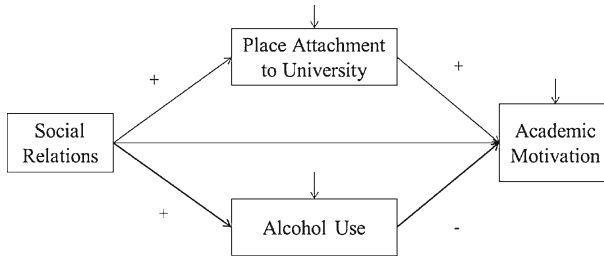
Research evidence based on university student samples suggested that better social relations in the university related to stronger school attachment. Using a quantitative method, Freeman et al. (2007) found that the perception of being accepted in the university was associated with higher levels of students' attachment to the university. In another study, France et al. (2010) also found that more positive relationships with others significantly related to higher university attachment. Chow and Healey (2008), in their interview study of first year university students moving from home to the university, found that students' establishment of social relationships allowed students to feel more settled or feel at home. This feeling of being at home or settled at school can be understood as place attachment. These studies add support to the argument

that having more social contacts with people in the university may relate to stronger development of attachment to the school.

Place attachment research outside of the university context has also supported the idea that positive social relations were related to stronger attachment to the neighborhood. For example, [Pretty et al. \(2003\)](#) asked participants the level of perceived friendship in their neighborhood and found that those who experienced more friendship had significantly higher attachment to the neighborhood. [Bonaiuto et al. \(1999\)](#), measuring social relations by asking participants about the quality of relationships with neighbors and friends, found that social relations significantly predicted higher place attachment. Using a single item “where do your close friends live” to see if participants’ close friends are in the target place, [Rollero and Piccoli \(2010\)](#) also found a positive significant relationship between friendships in a place and attachment to the place. Therefore, research evidence based on both university and non-university samples supports the argument that social relations are major predictors of place attachment.

### *1.2.3 Place attachment and academic motivations*

Place attachment to school was found to be important for positive academic outcomes ([Bergin and Bergin 2009](#); [Osterman 2000](#)). [Freeman et al. \(2007\)](#) conducted a study on place attachment to the university by surveying more than 200 freshmen on their attachment to university using items such as “Sometimes I feel as if I don’t belong to this university (reverse coded)”. Freshmen’s university attachment was found to correlate with their intrinsic motivation for academic study. Other studies have examined the relationship of school attachment to academic outcomes in younger students. Although not directly related to academic motivation, [Jackson et al. \(2011\)](#) found that having higher affect toward the university campus was associated with higher college involvement. Research that tested the effects of school attachment or school belongingness on elementary to high school students has shown that students’ attachment to their school was significantly related to their academic motivation and attitudes in these younger samples. For example, [Goodenow and Grady \(1993\)](#) studied junior high school students’ school belongingness by using belongingness items such as “I feel like a real part of this school” and found that students with higher belongingness had higher interest and effort in schoolwork. In another study, [Solomon et al. \(1996\)](#) also found that as fourth to sixth graders’ sense of belonging was increased in school through an intervention program, students’ academic self-esteem and achievement motivation increased. While the above studies measured academic motivation using items appropriate for elementary or junior high school students, the present study measures academic motivation in terms of students’ interest and efforts using modified items for college students. The above research evidence suggested that better social relations relate to stronger place attachment to university, which in turn relates to higher academic motivation. This suggests that place attachment positively mediates the relationship between social relations and academic motivation, which has the opposite effect compared to the negatively mediating process of alcohol use. In other words, we propose that students develop higher academic motivation from social relations through their stronger feeling of attachment to school.



**Fig. 1** Hypothesized model

### 1.3 Hypothesized model

Based on these prior studies, as shown in Fig. 1, it was hypothesized that social relations and academic motivation are related through two mediating processes, alcohol use and place attachment to university. We proposed that students who have good social relations may develop higher academic motivation through healthy attachment to school, but may develop lower academic motivations through more frequent alcohol use. The mediating process through alcohol use may be stronger in men than in women. In other words, it was hypothesized social relations can be associated with academic motivations in two ways, positively through place attachment and negatively through alcohol use. Specifically, we predicted that students' social relations would positively predict higher place attachment. Place attachment, in turn, would predict higher academic motivations. Social relations, however, would also predict higher alcohol use, which in turn predict lower academic motivations. The hypothesized model was computed separately for women and men to detect possible gender differences.

## 2 Method

### 2.1 Sample

A total of 295 students taking an Introduction to Psychology class at the University of Pittsburgh were recruited through the subject pool of the department of psychology. For the purpose of the current study, only participants who are 1) not native to Pittsburgh (where the University of Pittsburgh is located) and 2) living on campus were included in the analyses. Only participants aged 18–22 were included in the analyses for this paper, with those older or younger excluded. Thirteen participants who answered the survey with errors were also excluded. This reduced the number of participants to 271. Then participants who lived with their parents in Pittsburgh (where the University of Pittsburgh is located) ( $N=10$ ) and/or whose hometown is Pittsburgh ( $N=41$ ) were excluded, since effects of place attachment might have differed for these students. There were three participants who did not indicate whether they lived with their parents, so they were excluded. One participant who did not indicate year of study and one participant who did not indicate gender were excluded.

The final sample consisted of 228 university students. Among them, about half were female (52%) and half were male (48%). About 80% were freshman (N=180), 11% were sophomores (N=25), 6% were juniors (N=13) and 3% were seniors (N=8).

## 2.2 Procedure

Announcements were posted on the online system for recruiting Introduction to Psychology students. Students were free to choose which studies they would participate in. Participants were given a survey upon their arrival in the experimental room. The survey was described as ‘university life survey’. Participants had one hour to finish. After participants finished, a feedback sheet with a debriefing about the purpose of the study was given to each.

## 2.3 Measures

### 2.3.1 *Social relations*

Social relations were measured by six items adopted from [Cemalcilar \(2009\)](#) peer relationships subscale of the Scale for Measuring Schools’ Social Climate. The items were modified to refer in particular to social relations in the university, namely, ‘at Pitt’. For example, ‘I feel close to my classmates’ was modified as ‘I feel close to my classmates at Pitt’, and ‘we usually have a good time with my friends’ was modified as ‘we usually have a good time with my friends at Pitt’. Two items measuring participants’ relations with friends were added, including ‘I feel close to my friends at Pitt’ and ‘I can share my problems with my friends at Pitt’. Participants rated these items based on a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree). The obtained Cronbach’s Alpha for these items was .88. [Appendix A](#) shows the comparison between items from the original scale and modified items to be used in the present study. The modified items were averaged to create a mean score.

### 2.3.2 *Alcohol use*

Alcohol use was measured using 6 items based on the young adult questionnaire for the Monitoring the Future study ([Johnston et al. 2009](#)). Instead of measuring alcohol use in the past 12 months, the items adopted in the present study assessed the frequency of alcohol use, frequency of becoming drunk and frequency of binge drinking over the previous 30 days and during the previous week. The response categories of alcohol use were also changed from the original response categories for measuring alcohol use per year (0, 1–2, 3–5, 6–9, 10–19, 20–39, and 40 or more occasions) to 0, 1–2, 3–5, 6–9, 10–15, 16–20, and more than 21 times for monthly alcohol use and 0, 1–2, 3–5, and 6–7 times for weekly alcohol use. The items were averaged to create a mean score. The obtained Cronbach’s alpha for the scale was .84.



### 2.3.3 Place attachment to university scale

Attachment to the university was measured using a 30-item Psychological Place Attachment Scale (PPAS), modified from a previous 24-item version (Li and Frieze 2011). Items of the scale are shown in Appendix B. The target of attachment referred to Pitt, which was the abbreviated form of University of Pittsburgh. Sample items were 'I feel happy when I am at Pitt', 'I don't care about what happens at Pitt, and 'I have significant memories of Pitt'. Items were modified to fit the context of university. Particularly, instead of 'I know all the best places to go in (target place)'. It was modified as 'I know all the buildings and areas at Pitt'. Similar modifications were applied to 'I don't enjoy showing people important buildings or areas (instead of 'places') at Pitt'. Participants were asked to rate on a scale from 1 (strongly disagree) to 5 (strongly agree). The Cronbach's alpha for this scale was .94. To verify that the items consisted of one factor, exploratory factor analysis (EFA) was conducted to examine the number of factors existing within the scale. One major factor was found. Therefore, items were averaged to create a mean score.

### 2.3.4 Academic motivation

Academic motivation was originally measured with two scales assessing effort and interest in study. Effort in study was measured by a combined scale consisting of four items taken from the effort subscale in Ryan (1982) Intrinsic Motivation Inventory (IMI) and four items taken from the subscale of effort regulation in Pintrich et al. (1991) Motivated Strategies for Learning Questionnaire (MSLQ). The items were modified by adding 'at Pitt' or 'classes I take at Pitt' to refer in particular to their effort in studying at Pitt. Sample items were 'I put a lot of effort into the classes I take at Pitt' and 'when class work at Pitt is difficult, I give up or only study the easy parts (Reversed coded)'. Appendix C shows the modified items compared to the original items. The items were rated on a 5-point Likert scale from 1 (Strongly disagree) to 5 (strongly agree).

Interest in study was measured using Harackiewicz et al. (2008) Initial Interest Scale. The scale was originally used to measure students' interest in psychology. Items were thus modified to reflect students' general interests toward the classes they are taking by replacing "psychology" or this class' with 'the classes I am taking now at Pitt'. Sample items were 'I have always been fascinated by the classes I am taking now at Pitt', and 'I think the classes I am taking now at Pitt will be important for me to know.' Appendix D shows the modified items compared to original items. Participants rated the items on a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree).

The effort and interest scales were found to be highly correlated ( $r = .42$ ). Their mean scores fell on one single factor in an EFA. Therefore, in the main analysis, interest and effort were combined to measure students' academic motivations. The Cronbach's Alpha for the combined academic motivation scale was .89.

### 2.3.5 Demographic information

Lastly, participants were asked to report their age, year in college, and gender. Items about whether Pittsburgh (where the University of Pittsburgh is located) was their

**Table 1** Means of all tested variables

Tested variables	Male Means (S.D.)	Female Means (S.D.)
Social relations	3.88 (.05)	3.94 (.05)
Alcohol use**	2.37 (.09)	1.96 (.09)
Place attachment to university	3.82 (.07)	3.93 (.07)
Academic motivation**	3.62 (.05)	3.96 (.05)

\*\* $p < .01$ , based on a MANOVA testing the effect of gender on all variables. All variables were measured on a 1 = Strongly disagree to 5 = Strongly agree scale

**Table 2** Correlations among tested variables by gender

	1	2	3	4
1. Social relations	–	.27**	.64**	.40**
2. Alcohol use	.22*	–	.11	–.13
3. Place attachment to university	.70**	.29**	–	.51**
4. Academic motivations	.26**	.04	.37**	–

\* $p < .05$ ; \*\* $p < .01$ . Correlation coefficients above diagonal represent coefficients of male participants and coefficients below diagonal represent coefficients of female participants

hometown, the area where participants were living and whether they are living with their parents were included. These items were used to filter participants who were not qualified for our study's purpose.

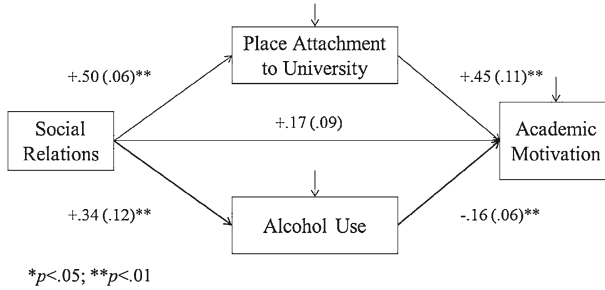
## 2.4 Data analysis

To test the hypothesized model, path model analyses were employed using Amos 18.0 software program (Arbuckle 2009) to look at the two mediating processes. The fit of the models were assessed with various fit indices, including  $\chi^2$  statistics, comparative fit index (CFI; Bentler 1990) and root mean square error of approximation (RMSEA; Browne and Cudeck 1993). Insignificant  $\chi^2$  statistic, CFI higher than .95, and RMSEA less than .08 were used as determinants of whether the data fit the proposed model.

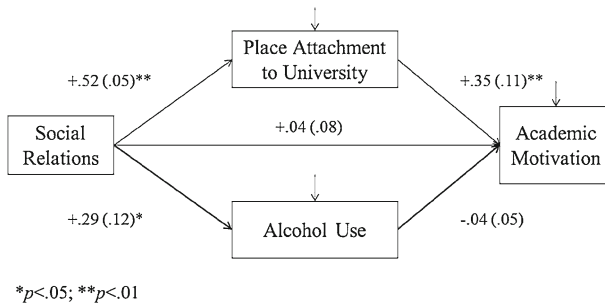
## 3 Results

### 3.1 Testing the hypothesized model

Before model testing, descriptive data consisting of means (as shown in Table 1) and correlations (as shown in Table 2) by gender for all tested variables was calculated. A one way MANOVA testing the main effects of gender on all tested variables was conducted. As shown in Table 1, gender effects were significant for academic motivation,  $F(1, 225) = 21.01$ ,  $p < .01$ , and alcohol use,  $F(1, 225) = 10.55$ ,  $p < .01$ . Men reported higher levels of alcohol use, while women reported higher levels of academic



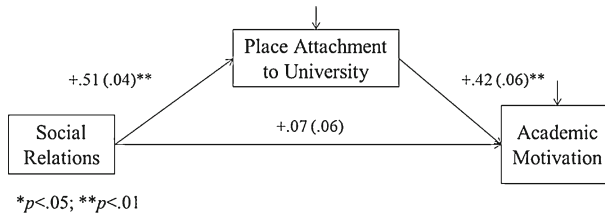
**Fig. 2** Testing the hypothesized model for men



**Fig. 3** Testing the hypothesized model for women

interest and motivation. These significant differences provided further support for the need to do separate analyses for men and women. The hypothesized model was then tested, and unstandardized regression weights and standard errors for male participants are shown in Fig. 2 and for female participants are shown in Fig. 3. To test alcohol use as a mediator, indirect effects are examined. As hypothesized, social relations significantly predicted higher alcohol use in both men ( $B = .34$ ,  $S.E. = .12$ ,  $p < .01$ ) and women ( $B = .29$ ,  $S.E. = .12$ ,  $p < .05$ ). However, alcohol use only significantly predicted lower academic motivations in men ( $B = -.16$ ,  $S.E. = .05$ ,  $p < .01$ ), but not women. A Sobel test (1982) was done to examine the mediating role of alcohol use. Significant Sobel Test Statistics,  $z = -2.12$ ,  $p < .05$ , were obtained in men, suggesting a significant mediation effect.

For testing place attachment to university as a mediator, indirect effects reflected that social relations significantly predicted higher place attachment to the university in both men ( $B = .50$ ,  $S.E. = .06$ ,  $p < .01$ ) and women ( $B = .52$ ,  $S.E. = .05$ ,  $p < .01$ ). Place attachment to the university significantly also predicted higher academic motivations in both men ( $B = .45$ ,  $S.E. = .11$ ,  $p < .01$ ) and women ( $B = .35$ ,  $S.E. = .11$ ,  $p < .01$ ). Significant Sobel Test Statistics were obtained for both men ( $z = 3.67$ ,  $p < .01$ ) and women ( $z = 3.04$ ,  $p < .01$ ), suggesting significant mediated effects in both genders. The direct effect between social relations and academic motivation was not significant for either gender, suggesting complete mediation. Overall, the model fit the data well for men  $\chi^2 = .82$ ,  $df = 1$ ,  $p = .36$ ,  $CFI = 1.00$  and  $RMSEA = .00$ . The whole set of predictors for men explained 41 % ( $R^2 = .41$ ) of variance of place attachment, 31 %



**Fig. 4** Improved model for women

( $R^2 = .31$ ) of variance of academic motivation, and 7% of variance of alcohol use ( $R^2 = .07$ ). The model fit data for women were  $\chi^2 = 4.36$ ,  $df = 1$ ,  $p < .05$ ,  $CFI = .97$  and  $RMSEA = .17$ . The whole set of predictors for women explained 49% ( $R^2 = .49$ ) of variance of place attachment, 15% ( $R^2 = .15$ ) of variance of academic motivation, and 5% of variance of alcohol use ( $R^2 = .05$ ). With only one out of the three models fit indicators matching with our criteria, the model may not fit the data well for women.

### 3.2 Improved model for women

Since the mediation through alcohol use was not significant in women, an improved model for women was developed by removing alcohol use and using place attachment to university as the only mediator. The model was then analyzed using OLS Regression. Figure 4 shows the unstandardized regression coefficients and standard errors. Indirect effects reflected that social relations significantly predicted higher place attachment to the university in women ( $B = .51$ ,  $S.E. = .04$ ,  $p < .01$ ). Place attachment to the university significantly also predicted higher academic motivations in women ( $B = .42$ ,  $S.E. = .06$ ,  $p < .01$ ). Significant Sobel Test Statistics were obtained ( $z = 6.14$ ,  $p < .01$ ), suggesting significant mediated effects. The direct effect between social relations and academic motivation was not significant, suggesting complete mediations.

## 4 Discussion

The data in general confirmed the hypothesized model. Particularly, we identified two mediating processes between social relations and academic motivation, with results differing by gender. For male college students who have good social relations, our data suggested that they may develop higher academic motivation through healthy attachment to university, but they may develop lower academic motivations through more frequent alcohol use. However, for women, no negative mediating process through alcohol use was identified, which is consistent with previous studies (Carrigan et al. 1998; Webb et al. 2007). Our data suggested that social relations are helpful for women's academic motivation through their stronger place attachment to the university. For both men and women, once mediators were added to the model, the relations between social relations and academic motivation became non-significant, suggesting that the two variables were complete mediators.

The university experience is a critical period that contributes to students' development of independent and critical thinking, which are important skills that they will use throughout their lives (McMillan 1987). Such skills require students to be highly motivated and active learners (Facione et al. 1996; Garcia and Pintrich 1992). However, students' lack of motivation is common in today's universities and colleges. Educators and researchers continually try to develop ways to organize and present materials to increase student' motivation (e.g., Bidwell 1990; Van Voorhis 1995). The present study offers a new way to think about the problem and a new way to approach improving students' academic motivation.

Our study considered the inter-related roles of alcohol use and place attachment in the relations between making friends (social relations) and students' academic motivation. Specifically, to answer our question "do friends always help your study", our results indicated that social relations do not seem to always help students' college study. Our results suggested that the impact of friends on academic motivation is based on students' place attachment to the school. If the social relations relate to higher drinking, students' academic motivation will then be discouraged. However, if the social relations enhance students' attachment to the school, students' academic motivation will be increased. Our data showed that this is particularly true in male students. While the model also works for female students, female students are less impacted by alcohol use.

Do our results simply suggest that students are influenced by the type of friends they make? Or, as referring to an old Chinese saying, "one takes the color of one's company"? Do the implications of our results merely indicate that colleges should try to guide college students to make well-behaved friends? Our data suggest that this may only be half-true. It is well-known that alcohol use relates to peer influence, meaning that knowing friends who use a lot of alcohol increases the likelihood that one drinks oneself (Engels et al. 1999). However, our study did not aim to find out the type of friends that one should make. Instead, we identified a positive role of college students' social relations in their academic learning. We suggest that one of the roles of the social relations is to help students feel attached at school. In other words, through making friends, students should be able to feel belongingness to the school or even feel at home when they are in school. Feeling that they belong will then encourage students to be more interested in studying and learning in school.

Our results also have practical implication for universities' orientation programs. Every year, universities welcome students with a series of orientation programs, hoping to help students mingle with one another and develop a stronger sense of belonging. Our results further support the potential benefits of such programs. However, our data suggest that if schools only focus on encouraging students to build social relations, it is possible that students, especially male students, may build their relations through alcohol use, resulting in negative academic motivations. Previous research also suggests that students build social relations through informal social environments such as parties which usually involve alcohol (Igra and Moos 1979). Therefore, to avoid the negative impact of social relations on academic motivation through alcohol use, schools may encourage students, especially male students, to develop healthy attachment and sense of belongingness to the school, resulting in a positive impact on academic motivation. Taking some examples from the items of our Psychological Place Attachment Scale

(PPAS), to help students' academic motivations in their following years in universities, schools can try to help students become familiar with the school environment, make them feel secure and at home, or engage them in more school related extra-curricular activities

Another possible application of the present findings is in dealing with students lacking academic motivation. Instead of merely providing students with more academic help or sending them to academic resource centers to get tutoring, professors, course instructors or school counselors may help them by looking into the students' social relations and guiding them to develop healthy relations and to feel attached to the school. Such an approach could be accomplished both within a particular class context such as starting a study group but also outside of a class such as through extracurricular activities at the school. A potential benefit of such an out-of-the-class approach may be that it has larger impact on the students' general academic motivation beyond any one class.

Also, it should be noted that our place attachment items solely described one's feelings, cognitions and behaviors towards the place, and were independent of one's relations with other people. This may suggest that helping students to feel affiliated with the school, develop significant and meaningful memories, and initiate attaching behaviors (cheering for school sports team, putting things around them that remind their school such as a souvenir with the school logo or encouraging them to update news of the school) are enough to increase their academic motivation. One explanation for such impact of place attachment may be due to the emotions and behaviors relating to the attachment. For example, with higher place attachment, students may be more likely have positive emotions toward the school and classroom environment, to keep track of information or news of the school, and to have better knowledge and understanding of school-related information. This is consistent with research that suggested the positive benefits for learning with positive affect (e.g., [Aspinwall 1998](#); [Isen et al. 1987](#)). These attaching behaviors are all beneficial for students as a learner in the environment. Also, previous studies suggested that when people are attached to a place, they are more likely to contribute to that place (e.g., [Lewicka 2005](#); [Payton et al. 2005](#)). Having higher place attachment may increase the likelihood of the students 'identifying' with that place, meaning they may take more personal responsibility and make more of an effort to perform well in that place. Similarly, having higher place attachment may also mean placing a higher value on the place. Students may then value the place-related activities and be more likely to engage and show more interest in academic study.

The present study also contributes to an improved measure of place attachment. The single major factor identified from the EFA suggested that psychological place attachment has three different components: affective, behavioral and cognitive, but these three components do not appear to be independent of one another. Overall, the scale has high reliability, and the items only relate to the central concepts of place attachment (affect, behavior and cognition toward place). Although the item wordings did not reflect relations with other people, the scale is highly correlated with social relations, a factor previously identified with place attachment (e.g., [Pretty et al. 2003](#); [Sampson 1988](#)). Also, the scale was tested in both a pilot study and our actual study, and yielded consistent results. Therefore, this scale is recommended to be used in future place attachment studies.

A limitation lies in detecting differences between the self-report measures of interest and effort. Initially, interest and effort were thought to be separate factors, a view that is consistent with prior work in the motivation literature (e.g., [Pintrich et al. 1991](#); [Schiefle 1991](#)). However, our initial data analysis (vis-à-vis EFA) suggested that combining them and treating them as a single motivational factor was a more valid measure of motivation for our data. This combined measure was shown to be internally reliable and consisted of previously used items, but the results suggest that it may not be complete in measuring *different aspects* of academic interest and effort. The similarity we observed between these two measures is consistent with prior work that has also shown strong positive correlations between these two measures (e.g., [Schiefle 1991](#)). These results call for further investigation into whether these two instruments really measure separate constructs (see [Pintrich 2003](#) and [Entwistle and McCune 2004](#) for similar concerns regarding the measurement of motivational constructs). Future studies should develop or refine measures to differentiate the two distinct types of academic motivations, interest and effort. For example, one approach may be to develop and use behavioral measures in addition to self-report questions. Future studies may also further look at different kinds of motivations, such as self-efficacy, achievement goals and extrinsic motivations.

The present study is also limited to attachment to a specific university taking introductory psychology course. This may limit the generalizability of the current findings. However, as a general requirement to most of the students in the university, the introduction to psychology courses in the university consists of students from many different majors. Also, statistics from 2010 school admission ([University of Pittsburgh 2011](#)) suggests that one third of the students are from out of the state of Pennsylvania. This may suggest that our sample was drawn from a diverse student sample coming from different majors and backgrounds.

## 5 Conclusion

In conclusion, the present work, despite some limitations, contributes to better understanding of the positive and negative effects of social relations on academic motivation by identifying the underlying mediation processes, highlighting the importance of positive school attachment through social relations on academic motivations. The present data also caution educators to help students not to develop social relations through the negative mediating process of alcohol use. The present data also raised the issue of place attachment, which has been predominantly discussed in environmental psychology. More place attachment studies are needed to expand the current context to better understand human relations with place and its influences on human motivations and behaviors. In terms of social relations research, our data showed that social relations can be negative when the relations happen in an unhealthy setting. However, if the social relations help students feel attached to the school, the outcome is very positive. Future social relations research may conduct similar studies to extend the scope of the field by identifying more circumstances when the impact of social relations may be negative. Through understanding this destructive side of social relations, more awareness can be brought to guide people in building a more positive social life.

## Appendix A

**Table 3** Comparison between original and modified social relations items

Items from Cemalcilar's (2009) study	Modified items for the present study
1. I feel close to my classmates	I feel close to my classmates at Pitt
2. I can share my problems with my classmates	I can share my problems with my classmates at Pitt
3. We usually have a good time with my friends	We usually have a good time with my friends at Pitt
4. I feel lonely in my class	I feel lonely at Pitt
5. We often help each other in class	We often help each other at Pitt
6.	I feel close to my friends at Pitt
7.	I can share my problems with my friends at Pitt

## Appendix B

**Table 4** Psychological place attachment scale (PPAS) items

1. I feel happy when I am at Pitt
2. I have significant memories of Pitt
3. I don't care about what happens at Pitt\*
4. I feel secure when I am at Pitt
5. Pitt has a special meaning for me
6. I keep up with the news about Pitt no matter where I am
7. I would not feel sad if I had to leave Pitt\*
8. I call my Pitt friends in order to know what is happening in Pitt when away
9. I don't feel I belong at Pitt\*
10. I know all the buildings and areas at Pitt
11. I have had bad experiences at Pitt\*
12. I suggest to others that they should visit Pitt
13. I like Pitt
14. I will forget about Pitt if I move away\*
15. I feel bored at Pitt\*
16. Pitt is not a comfortable place for me\*
17. I don't enjoy showing people important buildings or areas in Pitt\*
18. I put things around me to remind me of Pitt
19. Pitt seems unfamiliar to me\*
20. I know how to show people around at Pitt
21. When I am not in Pitt, I lose track of things happening at Pitt\*
22. I tell people about things that happened to me at Pitt
23. I don't know much about Pitt\*



**Table 4** continued

- 
24. I am proud of Pitt
  25. It feels good to come back to Pitt after I have been away
  26. I am always glad to meet people from Pitt if out of town
  27. I feel relaxed at Pitt
  28. Pitt is very special to me
  29. Pitt means a lot to me
  30. I cheer for at least one Pitt sports teams
- 

Pitt represents the University of Pittsburgh, which is the place of attachment the current study examined. It is located within the city of Pittsburgh in Pennsylvania, USA.

\*Reversed items

## Appendix C

**Table 5** Comparison between original and modified items for efforts in study

Original items (1–4 are from Ryan 1982; 5–8 are from Pintrich et al. 1991)	Modified items for the present study
1. I put a lot of effort into this	I put a lot of effort into the classes I take at Pitt
2. I didn't try very hard to do well at this activity	I don't try very hard to do well at the classes I take at Pitt
3. I tried very hard on this activity	I try very hard on the classes I take at Pitt
4. I didn't put much energy into this	I don't put much energy into the classes I take at Pitt
5. I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do	I often feel so lazy or bored when I do homework for the classes I take at Pitt that I quit before I finish what I planned to do
6. I work hard to do well in this class even if I don't like what we are doing	I work hard to do well in the classes I take at Pitt even if I don't like what we are doing
7. When course work is difficult, I give up or only study the easy parts	When class work at Pitt is difficult, I give up or only study the easy parts
8. Even when course materials are dull and uninteresting, I manage to keep working until I finish	Even when class materials are dull and uninteresting, I manage to keep working until I finish

## Appendix D

**Table 6** Comparison between original and modified items for interests in study

Original items from Harackiewicz et al. (2008)	Modified items for the present study
1. I have always been fascinated by <i>psychology</i>	I have always been fascinated by the classes I am taking now at Pitt
2. I'm really excited about <i>taking this class</i>	I'm really excited about the classes I am taking now at Pitt

**Table 6** continued

Original items from Harackiewicz et al. (2008)	Modified items for the present study
3. I'm really looking forward to learning more about <i>psychology</i>	I'm really looking forward to learning more about the classes I am taking now at Pitt
4. I think <i>the field of psychology</i> is an important discipline	I think the classes I am taking now at Pitt are important disciplines
5. I think what <i>we will study in introductory psychology</i> will be important for me to know	I think the classes I am taking now at Pitt will be important for me to know
6. I think <i>what we will study in introductory psychology</i> will be worthwhile to know	I think the classes I am taking now at Pitt will be worthwhile to know

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