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The Effects of Social Psychological Variables and Gender on the Grade Point Averages and Educational Expectations of University Students: A Case Study

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Abstract

This paper uses a social psychological model to examine the educational attainment and expectations of 569 male and female Education students enrolled in a major university in Western Canada. Structural equation modeling was used to examine the effects of gender on six social psychological variables (positive affect, negative affect, interaction with students, interaction with professors, motivation, and self-concept of ability) and the effects of gender and the social psychological variables on the students' grade point averages and educational expectations. In comparison with males, females had higher positive affect and more positive motivation. Two of the social psychological variables, self-concept of ability and interaction with students, had strong effects on grade point average and slightly weaker effects on educational expectations. When the interaction effects of gender and the social psychological variables were added to the analyses, slight increases in the explained variance in grade point average and educational expectations were evident. Females had slightly higher grade point averages than males and males had slightly higher educational expectations than females.

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Résumé

Les auteurs de cet article font référence à un modèle socio-psychologique pour analyser les attentes et la réussite éducative de 569 élèves inscrits en faculté d'éducation, dans une université de l'ouest du Canada. La modélisation par équation structurante *(structural equation modelling)* a été utilisée pour étudier les effets du sexe sur six variables socio-psychologiques: l'affect positif et négatif, l'interaction avec l'étudiant, l'interaction avec le professeur, la motivation et la perception de compétence. De plus, les effets du sexe et de ces variables socio-psychologiques ont été étudiés en relation aux attentes des étudiants et à leur note moyenne. Si l'on compare les hommes let les femmes, on trouve que les femmes ont plus d'un effet positif et plus de motivation. Deux variables s'avèrent fortement liées aux attentes éducatives et à la réussite: il s'agit du sentiment de compétence et de l'interaction avec les étudiants. L'ajout des variables d'interaction sexuée entraîne une augmentation légère mais marquée dans la variance expliquée des attentes éducatives et de la réussite moyenne. Les femmes ont une moyenne légèrement supérieure à celle des hommes et ceux-ci ont des attentes éducatives légèrement plus élevées que celles des femmes.

Introduction

For more than 25 years researchers have been estimating the effects of social background and educational characteristics of people on their later educational and social attainments (see, for example, Astin, 1993; Clifton, Williams, & Clancy, 1991; Pascarella & Terenzini, 1991). In addition, researchers have incorporated social psychological processes, in particular self-conceptions, motivation, and interactions with significant others, as intervening variables between the social and educational backgrounds and the social attainments of people (see Astin, 1993; Bank, Slavings, & Biddle, 1990; Clifton, et al., 1991; Pascarella & Terenzini, 1991).

In this paper I expand on this research in two ways. First, measures of the quality of life that students experience in universities are theoretically and empirically related to the traditional social psychological variables. Second, I examine how gender affects the social psychological variables, grade point averages, and educational expectations. Recent research suggests that males and females develop different social psychological dispositions towards their experiences in university, and these

dispositions, in turn, are differentially related to their educational attainment and expectations (see Astin, 1993). Nevertheless, Pascarella and Terenzini (1991) note that "uncertainty [still] exists about whether the developmental paths of men and women are the same" (p. 59).

The Theory

Quality of Life, Social Psychological Dispositions, and Educational Attainment

Human capital theory has been the basis for the development of models of educational and social attainments. Bidwell (1989) notes three ways that educational institutions create human capital. First, schools and universities increase the knowledge that people have; second, they help shape the social psychological dispositions that facilitate learning; and finally, educational institutions increase the reasoning power of individuals. This theory postulates that people use their knowledge, social psychological dispositions, and reasoning power as resources for occupational attainment and increased income.

There is a strong empirical relationship between the amount of education that individuals have and their ultimate social and economic attainments. In fact, educational attainment is one of the most powerful predictors of occupational prestige and income. The correlations between educational attainment and occupational status range between 0.5 and 0.7, and the correlations between educational attainment and income range between 0.3 and 0.4 (see Ashenfelter & Krueger, 1994; Krymkowski, 1991). More specifically, when other relevant variables are controlled, students who complete a 4-year university degree, in comparison with students who complete secondary school, have between 30 and 40 percent net average increase in occupational status and between 20 and 40 percent net average increase in incomes (Pascarella & Terenzini, 1991).

Considerable evidence suggests that to efficiently develop the human capital of students, universities need to provide an environment that enhances their quality of life (see Clifton, Etcheverry, Hasinoff, & Roberts, 1996; Roberts & Clifton, 1992). Presumably, students who are well-integrated into their academic programs and who are satisfied are more likely to have higher grade point averages and higher educational expectations than students who are not well-integrated into their programs and who are not satisfied (see Bidwell, 1989; Pascarella & Terenzini, 1991). On a practical level, professors must present their

intellectual demands to students in an environment that features positive interactions with them, as professors, and with other students. High intellectual demands coupled with positive social interactions with professors and other students presumably increases students' social and academic integration into the university (Phelan, 1979; Tinto, 1975).

Four variables are used in this study as indicators of the student's social (positive affect, negative affect, and interaction with students) and academic (interaction with professors) integration as postulated by Tinto (1975). At the organizational level, these variables are identified as dimensions of the quality of life, but at the level of individual students they are social psychological dispositions. Positive affect refers to students' global assessment of their educational experiences in terms of general enjoyment, feeling positive, and liking their faculty. Negative affect refers to the intensity and frequency with which students experience being upset, lonely, and restless. Interaction with students represents the quality of the interaction students have with each other, both inside and outside of classrooms, and indicates the degree to which they perceive that other students are easy to get to know, help them understand themselves, and accept them. Finally, interacting with professors represents students' perceptions that professors are fair, just, and take a personal interest in their work.

In addition, two other social psychological variables, motivation and self-concept of ability, have important relationships with the grade point averages and educational expectations of students (see Clifton, Williams & Clancy, 1991; Pascarella & Terenzini, 1991; Rosenberg, Schooler, Schoenbach & Rosenberg, 1995). Specifically, students who are highly motivated and/or those who have high self-concepts of ability are more likely to have higher educational attainment and expectations than students who have lower motivation and/or lower self-concepts of ability. As with the other social psychological variables, these two variables intervene between the social and educational backgrounds of university students and their educational attainment and expectations (see Pascarella & Terenzini, 1991; Rosenberg, et al., 1995).

Gender Differences

Gilligan (1982) proposed that moral reasoning, and subsequent social psychological dispositions that develop from it, are different for males and females. She argued that the major difference between the genders is

that females are more likely to define themselves in terms of relationships with others and to be concerned about intimacy and care. Males, on the other hand, are more likely to define themselves as autonomous individuals who are concerned with the attainment of status. As a result, the concern that females have with the well-being of others is said to reflect a "voice of care", and the concern that males have with status is said to reflect a "voice of attainment" (see also, Coser, 1991; Marini, Fan, Finley, & Beutel, 1996).

Furthermore, both Coser (1991) and Thoits (1986) have argued that males and females have different social identities. According to Thoits (1986) "the prevalence of certain role patterns by sex may structure the meaning of various roles for self-conceptions" (p. 271). Not surprisingly, females tend to have identities that relate to interpersonal relationships, and males tend to have identities that relate to employment and status. Consequently, I hypothesize that male and female university students have different social psychological dispositions that affect their grade point averages and educational expectations (Astin, 1993; Davis & Murrell, 1993; Ethington & Smart, 1986; Phelan, 1979).

The Social Psychological Model

Figure 1 presents the theoretical model to be tested in this study. This model follows established conventions and assumes that social background variables (gender, age, and socioeconomic status) and university variables (year, degree, program, and credit hours) are exogenous (see, for example, Astin, 1993; Bank, Slaving,, & Biddle, 1990; Pascarella & Terenzini, 1991). In turn, the social background and university variables influence the social psychological dispositions of students (positive affect, negative affect, interaction with students, interaction with professors, motivation, and self-concept of ability), and all of these variables influence the education variables (grade point average and educational expectations).

In this model I assume that the social background variables are correlated with the university variables, and I do not estimate the causal relationships between the variables in these two groups. In addition, I assume that the causal relationships between the exogenous and endogenous variables are unidirectional as many other researchers have assumed. These assumptions are not likely to bias the estimates of either gender or the social psychological variables on the educational variables (see Astin, 1993; Pascarella & Terenzini, 1991).

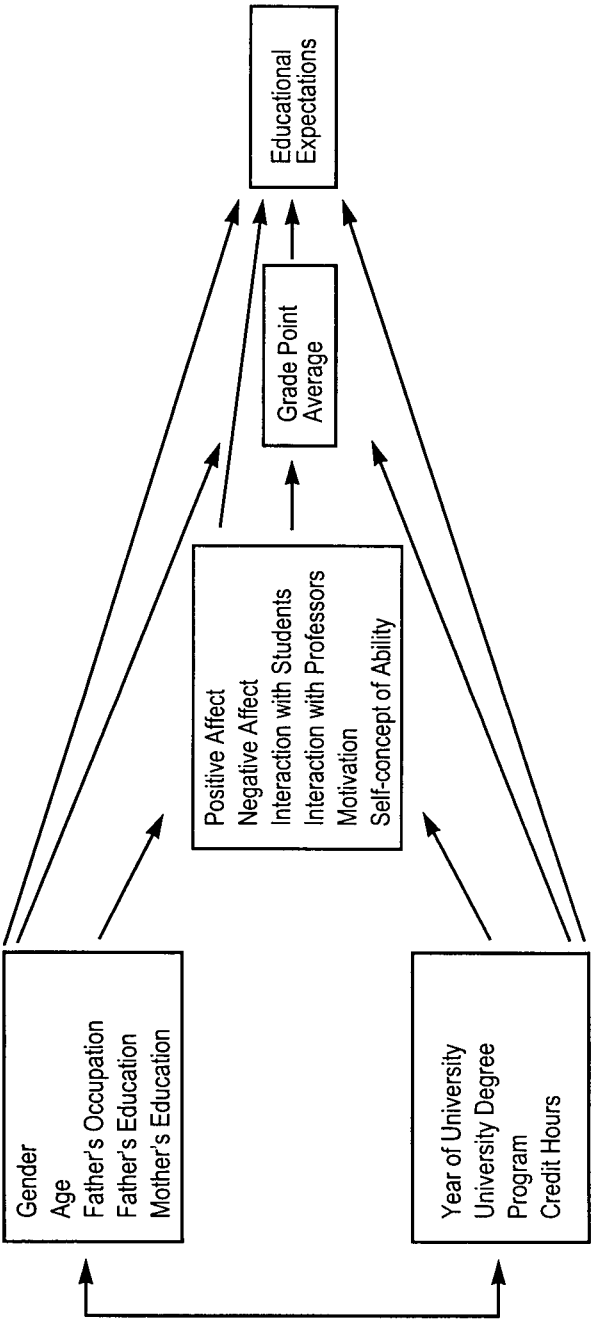

Figure 1
The model

This theoretical model is supported by social cognitive theory (Bandura, 1991), which argues that social psychological dispositions emerge as students, both males and females, respond to specific social situations and regulate the way they achieve the educational and occupational goals they set for themselves. The social psychological dispositions are related to specific ideals or norms that students hold and are directed towards defining and reinforcing appropriate behavior, such as obtaining high grade point averages and expecting to pursue graduate studies.

Method

Data

The data for this study were collected at a large university located in a Western Canadian city of approximately 650,000 people. In the spring of 1987, the Faculty of Education conducted a study of its students and programs for a review mandated by the senate of the university. A stratified random cluster sampling procedure was used to select undergraduate students to receive copies of a questionnaire that was designed to assess their social and university characteristics, the perceptions of the quality of their preparation programs, their social psychological dispositions, their grade point averages, and their educational expectations. A total of 19 classes of students from all required courses within each year of the undergraduate Bachelor of Education and Bachelor of Education/After Degree programs were selected, representing approximately 27 percent of the population of students. In total, 397 students were enrolled in these classes, and 308 students completed questionnaires resulting in a return rate of approximately 76 percent.

In the spring of 1992, the faculty conducted a second study of its students and programs. Similar procedures were used to select classes of students to ensure that approximately 20 percent of the population within each academic year of the Bachelor of Education and Bachelor of Education/After Degree programs was selected. This time, questionnaires were distributed to 364 students in 27 classes, and 261 students completed them resulting in a return rate of approximately 72 percent.

In both administrations of the questionnaires, students who were registered in two or more of the selected classes were asked to complete only one questionnaire. Some students were not present in the classroom when the questionnaires were distributed, and a few students chose not to

complete a questionnaire. Overall, data were obtained from 569 students who were representative, in terms of gender, age, residency (urban/rural), and grade point averages, of the population of students enrolled in the faculty during the 1986-1987 and 1991-1992 academic years.[1]

Questions about the generalizability of the findings may be raised because the sample is from a single faculty in a single Canadian university. The students in this sample are very similar in social background to students in the university, particularly the students in the Faculties of Arts and Sciences. Females are over-represented in the Faculty of Education compared with the University as a whole (66% vs. 53%), and the students in this Faculty have slightly higher GPAs than students in the Faculties of Arts and Sciences (2.82 vs. 2.77 out of 4.50). This evidence is consistent with evidence from other faculties of education in North America (see, for example, Pascarella & Terenzini, 1991). In addition, the correlations between a number of the variables in this study (see Table 2) are very similar to the correlations between similar variables in studies from other North American universities (see Hearn, 1987; Pascarella, 1984; Stage, 1989).[2]

Even though this evidence suggests that this sample is similar, at least in some respects, to other samples of university students reported in the literature, there is some evidence that sub-environments exist in universities, and students probably have a different quality of life depending on the particular environment they experience (see Pascarella & Terenzini, 1991). Specifically, a number of researchers have found that academic programs (e.g., Arts, Education, Sciences) affect the educational attainment and expectations of students (see Hearn, 1987; Pascarella & Terenzini, 1991). As a consequence, this study may be considered to be a case study of a single faculty.

Variables

Seventeen variables are used in the analyses, and they are grouped into four clusters: social background variables, university variables, social psychological variables, and educational variables (see Figure 1).

Five social background variables were included. **Gender** was treated as a dummy variable with males coded as 1 and females coded as 2. Responses to the question "How old are you?" provided data for age that was coded into single years from 18 to 28 and recoded into four groups for students who were 29 or older in order to normalize the distribution. The students indicated their **father's occupation** by selecting from a

standard hierarchical list of 15 categories ranging from farm laborers, coded 1, to self-employed professionals, coded 15. **Father's and mother's education** were measured on 9-point scales ranging from elementary school to completed graduate degree.

Four variables were included as indicators of university characteristics. **Year of university** was measured by the question "How many years of university education do you have? If you have been a part-time student, then estimate the number of equivalent full-time years." Students reported years of university ranging from 1 to 6 years. **University degree** was measured by asking the students to indicate whether they had already completed a university degree. A code of 1 was used to indicate that students had not completed a degree and a code of 2 was used to indicate that they had completed a degree.[3] Students indicated their **program** of study by reporting whether they were enrolled in elementary education, coded 2, or secondary education, coded 3. **Credit hours** was estimated by asking the students to indicate the number of credit hours of university work they were taking during the academic year. The data for this variable ranged, in increments of 3 hours, from 6 to 39 credit hours.

Six social psychological variables were used. Four of the variables were derived from 31 items developed to measure the students' quality of life (see Roberts & Clifton, 1992). Each item is a 5-point Likert scale ranging from definitely disagree, coded 1, to definitely agree, coded 5. The four variables were created by adding the appropriate items. **Positive affect** was indicated by 13 items, such as "The things I learn are important to me" and "The work I do is good preparation for my future." The alpha reliability coefficient for positive affect is .93. **Negative affect** was indicated by 4 items, such as "I feel depressed" and "I get upset." The alpha reliability coefficient for this variable is .79. **Interaction with student** was indicated by 5 items, such as "Other students accept me as I am" and "I get on well with the other students in my class." The alpha reliability coefficient for interaction with students is .75. **Interaction with professors** is indicated by 9 items, such as "Professors treat me fairly" and "Professors help me to do my best." The alpha reliability for this variable is .90. **Motivation** was measured on a 5-point scale with 1 indicating "unmotivated" and 5 indicating "very motivated" in response to the question "Please check how motivated you are to do well in your courses this year" (see Entwistle, 1968). To measure **self-concept of ability**, the students were asked "How good are you at your university

work compared to other students in your year?" (see Brookover & Erickson, 1975). The five response choices ranged from "a lot below average" to "a lot above average."

Finally, two educational variables were measured. **Grade point average** was measured by self-reported responses ranging from 0.0–0.9, coded as 1, to 4.0–4.5, coded as 8. **Educational expectations** were based on the question "What is the highest level of education you expect to complete?" and responses ranged on a 5-point scale from "a bachelor's degree," coded 2, to "a doctorate degree," coded 6.

Results

Zero-Order Relationships

A profile of the students is presented in Table 1. Three of the university characteristics were different for males and females. Specifically, the average male had an advantage, in comparison with the average female, of more than half a year in university education. Frequency distributions illustrate that slightly more than 30 percent of males and slightly less than 18 percent of females were enrolled in years 5 and 6. Moreover, almost 35 percent of males and only 19 percent of females held university degrees. Finally, approximately 22 percent of the males and 60 percent of the females were enrolled in the elementary program.

Important differences also existed between males and females on the social psychological variables. In comparison with males, female students had, on average, higher scores on positive affect (by 7%) and motivation (by 7%), and they had lower scores on negative affect (by 10%). On the educational variables, females had a lower grade point average, by slightly more than 11 percent, than males, and females had lower educational expectations than males. A frequency distribution illustrated that about 49 percent of the males and 39 percent of the females expected to pursue graduate studies. These results are consistent with the findings of other researchers (see Ethington & Smart, 1986; Isaac, Malaney, & Karras, 1992).

The correlation coefficients between all variables in the model are presented in Table 2. These coefficients were used to estimate the parameters of the model using ordinary least squares procedures (see Pedhazur, 1982, pp. 577–632). The structural equation modeling proceeded in three steps.

Table 1
Means, Standard Deviations, and Percentage of Missing Data on the Variables by Gender

Variables	Total Sample (n = 568)			Males (n = 192)			Females (n = 376)		
	Means	S D	Missing Data (%)	Means	S D	Missing Data (%)	Means	S D	Missing Data (%)
Gender	1.66	0.47	0.2						
Age	23.46	4.76	2.8	24.65	4.60	3.6	22.86	4.73	2.1
Father's Occupation	9.83	3.64	4.6	9.70	3.58	3.1	9.90	3.67	5.3
Father's Education	4.14	2.60	2.3	4.03	2.61	2.6	4.20	2.59	2.1
Mother's Education	3.77	2.05	1.8	3.58	1.97	2.1	3.87	2.08	1.6
Year of University	3.13	1.58	1.6	3.50	1.62	2.1	2.95	1.52	1.3
University Degree	1.24	0.43	0.0	1.35	0.48	0.0	1.19	0.39	0.0
Program	2.49	0.50	8.5	2.77	0.42	6.3	2.33	0.47	9.6
Credit Hours	27.31	5.77	2.5	27.71	5.15	1.6	27.11	6.05	2.7
Positive Affect	44.46	8.71	8.3	42.16	8.77	6.3	45.68	8.45	9.3
Negative Affect	10.25	3.20	7.9	10.34	3.18	7.3	10.20	3.21	8.3
Interaction with Students	18.63	2.48	6.7	18.37	2.29	5.7	18.77	2.55	7.2
Interaction with Professors	32.35	5.55	8.1	32.14	5.57	6.8	32.46	5.55	8.8
Motivation	3.63	1.22	0.9	3.39	1.30	0.5	3.76	1.16	1.1
Self-concept of Ability	3.68	0.71	1.1	3.77	0.70	1.6	3.62	0.71	0.5
Grade Point Average	5.96	1.01	2.8	6.02	0.96	2.1	5.93	1.04	3.2
Educational Expectations	3.50	1.37	1.6	3.77	1.39	1.0	3.36	1.35	1.9

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Table 2
Correlation Matrix for the Variables in the Model

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
1. Gender																
2. Age	–.178															
3. Father's Occupation	.025	–.098														
4. Father's Education	.031	–.156	.625													
5. Mother's Education	.068	–.215	.381	.536												
6. Year of University	–.164	.328	.020	.066	–.014											
7. University Degree	–.179	.210	.085	.062	–.035	.537										
8. Program	–.413	.027	–.092	–.047	–.082	.180	.196									
9. Credit Hours	–.050	–.212	.037	.030	.069	–.032	.016	.164								
10. Positive Affect	.192	–.002	–.023	–.047	.046	–.246	–.211	–.227	–.081							
11. Negative Affect	–.021	.064	.024	.032	–.022	.237	.165	–.018	.014	–.409						
12. Interaction with Students	.076	–.020	.115	.069	.038	.059	.023	–.116	.042	.384	–.133					
13. Interaction with Professors	.028	.023	–.061	–.044	–.023	–.093	–.102	–.026	.013	.569	–.331	.463				
14 Motivation	.142	.145	–.085	–.087	–.024	–.083	–.106	–.134	.018	.457	–.251	.193	.266			
15. Self–concept of Ability	–.100	.199	.083	.112	.070	.242	.135	.114	.119	–.043	–.046	.174	.149	.178		
16. Grade Point Average	–.041	.284	.028	.061	.002	.212	.221	.074	.079	.007	–.024	.200	.141	.198	.640	
17. Educational Expectations	–.141	.194	.089	.135	.065	.354	.294	.105	.048	–.162	.089	.071	–.026	–.001	.292	.277

First, reduced form estimates (Alwin & Hauser, 1975) of the social and university characteristics on the social psychological variables (Table 3), grade point average, and educational expectations (Table 4), were used to estimate their total effects. Second, the step-by-step addition of the intervening variables, for both grade point average and educational expectations (Table 4), allowed the computation of direct effects, from the full model, and indirect effects, from a comparison of the full model and the reduced models. Finally, to assess the interaction effects of gender and the six social psychological variables on grade point average and educational exceptions, the increments in R^2 that result from gender and the interaction variables were computed (Table 5).[4]

Main Effects of Gender and the Social Psychological Variables

A simple way of determining the main effects of gender and the social psychological variables on the dependent variables, using structural equation modeling, is to incorporate them, as an exogenous variables, into the analyses of the fully developed models. The standardized coefficients for these analyses are presented in Tables 3 and 4. By examining the fully recursive model presented in Table 3, it is seen that gender had small effects on two of the six social psychological variables. Females had higher positive affect (.107) and higher motivation (.129) than males.[5] In addition, when separate analyses were conducted with gender removed from the list of exogenous variables, there were significant decreases, by approximately 1 percent, in the coefficients of determination for these two variables but not for the other four social psychological variables. These results are consistent with the findings of Hearn (1987) and Phelan (1979) who suggested that females, in comparison with males, have a somewhat more positive evaluation of the social environment of universities and are more motivated to succeed.

Also of interest are other social background and university variables that are correlated with gender (see Table 2) and have important effects on the social psychological dispositions of students. The most important of these are age and year of university. Older students had higher scores than younger students on positive affect (.098), motivation (.226), and self-concept of ability (.202). For year of university, students with more education had lower scores on positive affect (–.192), higher scores on negative affect (.224), and higher scores on self-concept of ability (.174). The effects of year of university may result from either socialization or

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Table 3
Standardized Regression Coefficients and R^2s for the Social Psychological Variables

Independent Variables	Positive Affect	Negative Affect	Interaction with Students	Interaction with Professors	Motivation	Self-concept of Ability
Gender	.107*	–.006	.041	.016	.129**	–.014
Age	.098*	–.019	–.023	.066	.226***	.202***
Father's Occupation	–.008	.005	.109	–.053	–.063	.027
Father's Education	–.062	.028	–.007	.006	–.037	.087
Mother's Education	.083	–.046	–.020	.001	.044	.054
Year of University	–.192***	.224***	.096	–.072	–.080	.174***
University Degree	–.077	.059	–.004	–.070	–.065	–.024
Program	–.125**	–.079	–.116*	–.004	–.078	.062
Credit Hours	–.043	.031	.059	.029	.084	.150***
R^2	.123	.066	.036	.019	.084	.121

* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

attrition, and it is impossible to determine if students develop less positive affect and higher self-concepts over the years that they were enrolled in the university or if students with more positive affect and lower self-concepts were more likely to drop out of university. Consequently, these results are not interpreted.

In Table 4, both reduced-form coefficients and coefficients reflecting the fully recursive model are presented for grade point average and educational expectations. For grade point average, step 1 presents the reduced-form coefficients and step 2 presents the fully recursive coefficients. For educational expectations, steps 1 and 2 present the reduced form coefficients and step 3 presents the fully recursive coefficients (see Alwin & Hauser, 1975). Indirect effects can be calculated by subtracting the relevant coefficients from the coefficients reported in previous steps.

Net of the other social background and university variables, gender had a small positive effect on grade point average (.060) and a small negative effect on educational expectations (–.056). Neither of these effects are statistically significant. In addition, virtually none of the effects of gender on grade point average and educational expectations were mediated by the social psychological variables. A comparison of the correlation coefficient reported in Table 2 (–.041 and –.141 respectively) with the standardized regression coefficients in the fully recursive model shows that what may have been interpreted, at the zero-order level, as a slight disadvantage to female students in grade point average and a substantial disadvantage in educational expectations is largely explained by differences between the genders on the university background variables.

There are, however, other exogenous and endogenous variables that significantly affected grade point average and educational expectations. Of these, self-concept of ability had the most powerful effect on grade point average (.568). The second most powerful effect on GPA was age (.170); older students had significantly higher grades than younger students. In this case, almost 43 percent of the total effect of age was mediated by the social psychological variables (.296 – .170 = .126), which suggests that older students had a higher grade point average than younger students, in part, because of their social psychological dispositions, particularly their positive affect, motivation, and self-concept of ability.

Of the variables that affected educational expectations, the most powerful was year of university. The direct effect of this variable was .183 and the indirect effect was .048 (.231 – .183 = .048). In other words, 21 percent

Table 4
Standardized Regression Coefficients and R^2s for Grade Point Average and Educational Expectations

Independent Variables	Grade Point Average		Educational Expectations		
	Step 1	Step 2	Step 1	Step 2	Step 3
Gender	.062	.060	−.058	−.051	−.056
Age	.296***	.170***	.122**	.091	.075
Father's Occupation	−.027	−.048	.002	−.007	−.003
Father's Education	.099	.051	.109	.088	.084
Mother's Education	.017	−.012	.040	.040	.041
Year of University	.045	−.063	.231***	.177***	.183***
University Degree	.132**	.149***	.126**	.125**	.111*
Program	.039	.017	.009	−.007	−.008
Credit Hours	.134**	.036	.068	.031	.028
Positive Affect		−.031		−.117*	−.114
Negative Affect		.005		−.002	−.002
Interaction with Students		.095*		.058	.049
Interaction with Professors		.016		.010	.009
Motivation		.068		.036	.030
Self-concept of Ability		.568***		.171***	.119*
Grade Point Average					.090
R^2	.139	.469	.172	.211	.215

* p<.05
** p<.01
*** p<.001

of the total effect was mediated by the social psychological variables and grade point average. In addition, as expected, university degree had a significant direct effect (.111) on educational expectations.[6] In this case, 12 percent of the total effect (.126 – .111 = .015) was mediated by the social psychological variables and grade point average.

Finally, two of the six social psychological variables had important effects on educational expectations. Self-concept of ability had a total effect of .171 and a direct effect of .119. Not surprisingly, 30 percent of the total effect (.171 – .119 = .052) was mediated by grade point average, which suggests that while self-concept of ability and grade point average were significantly interrelated, they had independent effects on educational expectations (see Rosenberg, et al., 1995). The other social psychological variable that had an important effect on educational expectations was positive affect, with a total effect of –.117 and less than 3 percent being mediated by grade point average (–.117 – (–.114) = –.003). The effect of negative affect was essentially zero, probably because positive and negative affect are moderately correlated (–.409). Surprisingly, these results suggest that students who had positive affective dispositions were more likely to have had lower educational expectations than students who had neutral or negative dispositions.

In the theoretical perspective I hypothesized that gender interacts with the social psychological variables and that these interactions affected grade point average and educational expectations. If this is true, the interaction effects should account for additional explained variance in both grade point average and educational expectations. Consequently, the data were examined for gender-based interactions as recommended by Jaccard, Turrisi, and Wan (1990) and Pedhazur (1982).

Interaction Effects

The first panel of Table 5 presents coefficients of determination for grade point average and educational expectations based on different combinations of predictor variables. The first row presents the amount of variance explained in grade point average by the social background, university background, and social psychological variables. The second row presents the amount of variance explained in grade point average when gender was incorporated into the predictive equation. Thus, differences between rows 2 and 1 represent increases in the explained variance due to gender, net of social background, university background, and social

psychological variables. In row 3, six interaction effects (Gender x Positive Affect, Gender x Negative Affect, Gender x Interaction with Students, Gender x Interaction with Professors, Gender x Motivation, and Gender x Self-concept of Ability) were incorporated into the predictive equation. The amount of variance explained by these six terms, net of the main effects, was obtained by comparing the percentage in row 3 with the percentage in row 2. Similar information and interpretations were obtained for educational expectations from the figures in rows 4, 5, and 6. F-ratios, testing the significance of the net gender main effects and the two-way gender interaction effects, are presented in the second panel of this table (see Jaccard, Turrisi, & Wan, 1990).

When gender was added to the social background, university background, and social psychological variables, a small but statistically significant increase in the explained variance was obtained for grade point average (.469 – .466 = .003) but not for educational expectations (.215 – .213 = .002).[7] Moreover, when the six interaction effects were added to the full model, statistically significant increases were contributed to both grade point average (.479 – .469 = .010) and educational expectations (.253 – .215 = .038). In other words, the interaction effects contribute 1 percent to the explained variance in grade point average and almost 4 percent to the explained variance in educational expectations. In total, these findings illustrate that slopes and intercepts vary with gender (Jaccard, et al., 1990). The advantage that females had in grade point average, net of the other exogenous variables, resulted from both the main effect of gender and the two-way interaction effects of gender and the social psychological variables. For educational expectations, the main gender effect, net of the other exogenous variables, was not significant, but the six two-way gender interaction effects were significant. Specifically, males had higher educational expectations than females largely because of their social psychological dispositions.[8]

Discussion

A major concern of researchers in education has been to estimate the effects of social background, educational characteristics, and social psychological dispositions of people on their later educational attainment and expectations. This paper focused on the effects of gender and social psychological variables on the educational attainment and expectations of university students because this has been a neglected area of research

Table 5
Variance Explained in the Academic Variables by Gender and the Gender X Social Psychological Interactions

Predetermined Variables	Grade-Point Average	Educational Expectations
1. Social Background, University Background, Social Psychological	.466	
2. Social Background, University Background, Social Psychological, Gender	.469	
3. Social Background, University Background, Social Psychological, Gender, Interactions	.479	
4. Social Background, University Background, Social Psychological, Grade Point Average		.213
5. Social Background, University Background, Social Psychological, Grade Point Average, Gender		.215
6. Social Background, University Background, Social Psychological, Grade Point Average, Gender, Interactions		.253

Row Differences	F-ratios	
1 vs 2	2.46***	
2 vs 3	7.86***	
4 vs 5		1.43
5 vs 6		22.67***

*** p<.001

(Pascarella & Terenzini, 1991). It was argued that social psychological variables intervene between the social and university characteristics of students and their educational attainment and expectations. Specifically, the social psychological dispositions that students develop in a university (positive affect, negative affect, interaction with students, interaction with professors, motivation, and self-concept of ability) emerge as they respond to specific social situations, and which, in turn, influence their grades and the amount of education they expect to receive. The literature also suggests that these social psychological variables function differently for males and females.

Overall, self-concept of ability had the most powerful effect on grade point average with age, university degree, and interaction with other students having smaller effects. This implies that students who have high self-concepts of ability, are older, have degrees, and have positive interaction with other students have higher grades than students who lack these resources. In turn, for educational expectations, year of university had the most powerful effect, followed by university degree and self-concept of ability with similar, and smaller, effects. It is not surprising that students who have completed more university education expect to complete even more education. The effect of year of university may result from either socialization or attrition and it is impossible to determine if students developed higher educational expectations over the years they are enrolled in university or if those with lower expectations are more likely to drop out.

The analyses also suggest that females had a slight advantage in grade point average, which resulted from both the main and interaction effects. As such, females did slightly better than males because they had more positive social psychological dispositions and because they had other attributes that were not measured in this study. For educational expectations, on the other hand, males had slightly higher educational expectations largely because of their social psychological dispositions. These results are consistent with the findings of Hearn (1987) and Phelan (1979) who suggest that females, in comparison with males, have a more positive evaluation of the social environment in universities and are more motivated to succeed.

These results support social cognitive theory (Bandura, 1991) which argues that social psychological dispositions emerge as students respond to specific social situations, particularly specific aspects of their social

(gender and age) and university backgrounds (year of university and degree). In turn, social psychological variables (self-concept of ability and interaction with students) affect grade point averages and educational expectations. In this respect, these social psychological variables are directed towards defining and reinforcing students' quests for higher grades and pursuing graduate studies.

Moreover, the results of this study also support the literature which suggests that females are more often affected by social relationships than males, and irrespective of social relationships, males expect to obtain higher educational credentials than females (see Coser, 1991; Gilligan, 1982; Marini, et al., 1996; Tinto, 1975). In this respect, the results lend some support to the notion that females have a "voice" that relates to other people, while males have a "voice" that relates to educational and occupational attainment (see Gilligan, 1982).

Future research should investigate the effects of social psychological variables and gender for other samples of university students – students in Arts and Engineering, for example — to determine if these results are generalizable. In addition, a panel study, which follows students as they progress through university, could help determine, in greater detail, what is happening to students. It is important to understand, for example, why female students are more likely than males to enroll in certain programs and not in other programs. Also, it is important to understand why females have more positive social psychological dispositions than males, and how these dispositions change as students progress through their programs.

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Notes

[1] The effects of cohort on all the variables in the model were examined, and no appreciable effects were evident. Consequently, cohort was not used as a variable in the analyses.

[2] For example, in a study of 418 students enrolled in two moderately selective U.S. universities, Hearn (1987) reports a correlation of –.06 between gender and GPA, and I report a correlation of –.04; both Hearn and I report correlations between gender and faculty-student interaction of .03; and he reports a correlation between GPA and educational plans of .23 and I report a correlation between GPA and educational expectations of .28.

[3] Dummy variables are usually coded 0 and 1, as one of the reviewers correctly noted. However, it does not matter how the levels of dummy variables are coded if a researcher is only interpreting the slopes and not the intercepts, which are affected by the coding (see Pedhazur, 1982, pp. 273–316). Only slopes are interpreted in this article.

[4] Before the analyses were conducted, missing data were examined, and they were relatively randomly distributed across the variables. In addition, the effects of missing data were examined when both listwise and pairwise procedures were used. In both cases, the pattern of results remained the same for both males and females. These results are based on pairwise procedures because it

retains the greatest number of cases, has the least effect on the precision of the estimates of the population parameters, and has the least effect on the power of the tests of statistical significance. Tabachnik and Fidell (1989, pp. 60–66) provide a justification of this procedure.

[5] The standardized coefficients for gender are small. However, this is deceptive because dichotomous variables generally have small coefficients for technical reasons. Specifically, two values for an independent variable (male and female) shrink the standardized coefficients for the relationships between that variable and dependent variables. In addition, the relatively large standard deviations in the social psychological variables, among males and among females, diminishes the standardized effect of gender even when the average differences between the groups are relatively large (see Table 1).

[6] As noted previously, 27 percent of the students already had completed a university degree. Consequently, there was a necessary relationship between these two variables. However, the correlation between the two variables is only .294 (see Table 2) so multicolinearity is not a problem.

[7] The significant increase in R^2 for GPA may seem surprising because the direct effect of gender on GPA (Table 4) is not significant. However, statistically, the direct effect of gender is relatively small as already noted, and it is calculated in a different way than the increment in R^2 that is explained by a variable (see Pedhazur, 1982, pp. 175–181).

[8] An alternative way of partitioning the total gender variance is by comparing the coefficients in separate analyses for males and females. Separate analyses for each gender were examined, but they added very little to the analyses already presented.