

## Depression Symptoms in Canadian Psychology Graduate Students: Do Research Productivity, Funding, and the Academic Advisory Relationship Play a Role?

Daniel L. Peluso, R. Nicholas Carleton, and Gordon J. G. Asmundson  
University of Regina

Depression is one of the most common psychological disorders affecting university students (Rimmer, Halikas, & Schuckit, 1982; Vazquez & Blanco, 2008); however, undergraduate students have received the majority of the research focus. The limited research available on graduate students suggests they may also be vulnerable to developing depression (Eisenberg, Gollust, Golberstein, & Hefner, 2007). The current investigation provides initial data on depression symptoms in Canadian psychology graduate students. Participants included psychology graduate students from across Canada ( $N = 292$ ; 87% women) who were currently enrolled in clinical, experimental, counselling, and educational programmes. Each of the participants completed the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) and measures of: funding, research productivity, hours worked, and their advisory relationship. A substantial proportion of students (33%) reported clinically significant symptoms of depression ( $CES-D > 16$ ), with a significant minority reporting severe symptoms of depression and impairment. There were no differences in symptom reporting across programme type; however, results of regression analyses indicated that advisory relationship satisfaction and greater current weekly hours worked were significant predictors of depressive symptoms for students enrolled in experimental programmes. In contrast, depression symptoms were unrelated to funding, research productivity, hours worked, and advisory relationship satisfaction for students in all other programmes. Implications and future directions for research are discussed.

**Keywords:** graduate psychology students, depression, research productivity, graduate student funding, advisory relationship

Depression is a disabling disorder that can disrupt an individual's occupational, social, and physiological functioning (American Psychiatric Association, 2000). The lifetime prevalence of major depression is estimated at 16% in the general population (Kessler et al., 2003). In many cases (20–30%) symptoms of depression persist for years, often without remission (Wells, 2009). University students represent a group thought to be at particular risk for developing depression and emotional disorders (Stewart-Brown et al., 2000). Indeed, depression is one of the most common psychiatric disorders affecting university students, with current prevalence rates estimated at 10% in undergraduate samples (Rimmer, Halikas, & Schuckit, 1982; Vazquez & Blanco, 2008). In Canada, a study of first-year undergraduates at a Canadian institution found 7% of men and 14% of women met criteria for major depressive disorder (Price, McLeod, Gleich, & Hand, 2006). The prevalence of depression may be due, in part, to the myriad stressors confronting students (e.g., financial concerns, academic performance, relationship issues; Lee, 2009; Westefeld & Furr, 1987). Such stressors represent significant predisposing factors to developing

depressive symptoms (Kessler, 1997). Depressive symptoms in students can compromise learning and memory processes, adversely affecting academic performance (Hysenbegasi, Hass, & Rowland, 2005), and are associated with problem drinking (Beck et al., 2008) and suicidal ideation (Garlow et al., 2008).

Research on depression in graduate students is limited. Vazquez and Blanco (2008) found that 8.7% of a sample of 554 university students met criteria for a major depressive episode; however, relatively few respondents (4%) were graduate students. Eisenberg and colleagues (2007) have reported that 11.3% of a mixed sample of graduate students had clinically significant depression. More recently, Sturman and Mongrain (2008) found that involuntary subordination (i.e., a latent variable comprised of both entrapment and poor social comparison, wherein a person feels subjugated) predicted recurrence of depression symptoms in a mixed sample of graduate students, with 13% meeting criteria for major depressive disorder. Those who felt trapped in a subordinate social position or rank were particularly vulnerable to symptoms of depression—a finding supported by substantial research literature (Brown, Harris, & Hepworth, 1995; Kendler, Hettema, Butera, Gardner, & Prescott, 2003). Other cognitive risk variables, such as sociotropy, perfectionistic beliefs, and a negative inferential style regarding academic failure have been associated with a more chronic history of depression among a sample ( $N = 77$ ) of graduate students (Mongrain & Blackburn, 2005). This study also found that a negative inferential and autonomous style uniquely predicted re-

---

Daniel L. Peluso, R. Nicholas Carleton, and Gordon J. G. Asmundson,  
Department of Psychology, University of Regina.

Correspondence concerning this article should be addressed to Gordon J. G. Asmundson, Department of Psychology, University of Regina, 3737 Wascana Parkway, Regina SK, Canada S4S 0A2. E-mail: gordon.asmundson@uregina.ca

currence of depression above history of depression. Similarly, Mongrain and Leather (2006) found that self-criticism was increasingly associated with past depressive episodes as immature dependence increased. After controlling for current symptoms, neuroticism, and number of previous depressive episodes, the interaction between self-criticism and immature dependence predicted future depressive episodes. In clinical psychology graduate students the prevalence of depression appears to be substantially elevated relative to that in the general population and mixed samples of graduate students. For example, in one large study of American clinical psychology graduate students, nearly 25% were currently depressed (Holzman, Searight, & Hughes, 1996). This finding has not been replicated. Moreover, there is no comparative evidence evaluating depressive symptoms in clinical psychology graduate students relative to experimental, counselling, and education psychology graduate students.

The primary purpose of the current study was to assess for the prevalence of current depressive symptoms among psychology graduate students. The only prior investigation (Holzman et al., 1996) focused on clinical psychology graduate students without comparisons across programme types; as such, the current investigation included students enrolled in clinical, experimental, counselling, and educational programmes. The secondary purpose was to determine the relationship between depression and various indices of academic functioning. Research productivity—typically indexed by publications (Feist, 1997) — is essential for securing institutional and federal funding to support students. Similarly, funding can be seen as an index of student achievement, given that scholarship and bursaries are typically distributed based on the success or perceived quality of the student (Matson et al., 2005). Finally, there is empirical evidence demonstrating the importance of a supportive supervisory relationship for graduate students (Schlosser & Gelso, 2001; Schlosser, Knox, Moskovitz, & Hill, 2003). Students' perceptions of their advisory relationship were positively correlated with their perceptions of the advisor's expertise, attractiveness, and trustworthiness (Schlosser & Gelso, 2001). Positive ratings of the advisory alliance were associated with greater self-efficacy with respect to research and more positive perceptions of research. Subsequent qualitative research in this area provided further support for the importance of advising to student success in graduate training (Schlosser et al., 2003); specifically, satisfied students typically perceived their advisory relationship as positive and encouraging and indicated that open management of conflict actually strengthened the relationship (Schlosser et al., 2003). Evaluating the contributions of each of these factors (i.e., research productivity, funding, supervisory relationship) to the variance in depressive symptoms may provide useful insights for both graduate students and academic supervisors.

## Method

### Participants

Participants ( $N = 292$ ) were recruited from the Canadian Psychological Association (CPA) student list-serve via e-mail as well as Web media advertising, both of which directed them to a secure Web site for completion of an online questionnaire package. Web-based data collection has been demonstrated to be a valid approach for questionnaire-based research (Gosling, Vazire, Srivastava, &

John, 2004). With respect to distribution of sex, 255 (87%) participants reported being women (21–46 years old;  $M_{\text{age}} = 27.4$ ;  $SD = 4.1$ ), 33 (11%) reporting being men (23–57 years old;  $M_{\text{age}} = 28.9$ ;  $SD = 6.2$ ), and four participants chose not to indicate their sex. The reported sex ratio is in line with prior research (i.e., 88% female respondents) assessing student perspectives of Canadian psychology graduate programmes (Peluso, Carleton, & Asmundson, 2010). Approximately 34% reported being enrolled in master's degree programmes, 22% in direct-entry doctoral programmes, and 44% in doctoral programmes. Participation was restricted to psychology graduate students who were currently enrolled in a psychology programme in Canada. Participants were informed that the study received ethical approval from the University Research Ethics Board. Furthermore, participants were assured that all responses would be kept confidential. Limited demographic information was obtained in order to further safeguard confidentiality. Participants were not compensated.

### Measures and Procedure

The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) was used to assess symptoms of depression. The CES-D comprises 20 items, each phrased as a self-statement (e.g., "I did not feel like eating; my appetite was poor", "I felt hopeful about the future"). Respondents rate how frequently each item applied to them over the course of the past week using a four-point Likert-type scale ranging from 0 ("Rarely or none of the time [less than 1 day]") to 3 ("Most or all of the time [5–7 days]"). Although highly conservative consensus supports a CES-D cutoff score of 33 for symptoms consistent with a diagnosis of severe depression (Santor, Zuroff, Ramsay, Cervantes, & Palacios, 1995), more general consensus suggests that scores greater than 16 are consistent with a diagnosis of clinically significant symptoms of depression (Boyd, Weissman, Thompson, & Myers, 1982; Roberts, Lewinsohn, & Seeley, 1991). The reliability for the current sample was .93 (95% CI was .91–.94) and the average interitem correlation clinical was .39.

Students also responded to questions on student mentorship, productivity, and funding. Participating students characterised their general satisfaction, and perceived quality of their relationship with their academic advisor (i.e., level of satisfaction with the relationship and perceptions about the quality of the relationship) using a 5-point Likert-type scale ranging from 1 (*Not at all*) to 5 (*Extremely*). Second, using a comparable 5-point Likert-type scale, participants rated the quality of advising in areas identified as being central to graduate students' functioning (i.e., theses/dissertation, research design, writing, grants/scholarships/awards, publications, coursework, clinical work, professional politics, self-care and balance). Third, participants quantified their own scholarly activity to provide an index of research productivity (i.e., peer-reviewed journal articles, posters, symposia, and book chapters). Finally, participants were asked to quantify the amount of funding they received from academic sources (i.e., Tri-Council, scholarship from the institution, funding from academic advisor). In answering these questions, the students provided an index of four main areas of graduate student life—the advisory relationship itself, aspects of advising, scholarly productivity, and awards or funding.

## Analyses

Descriptive statistics were calculated for each item within the total sample. Thereafter, a Pearson's correlation analysis was performed to assess the interrelationships between the variables. A series of *t* tests were used to compare responses from men and women on each of the measures to assess for any systematic differences based on sex. Students were categorised with clinically significant depression to provide simple comparisons with prior epidemiological research reports (Eisenberg et al., 2007; Holzman et al., 1996). To that end, the number of students in the sample and each programme type who reported depression symptoms that exceeded the conservative (>33) or standard (>16) CES-D cutoff scores were calculated (see Table 1). An analysis of variance (ANOVA) was used to compare CES-D scores across each of the programme types to assess for between-groups differences. Tukey's Honestly Significant Difference (HSD) post hoc tests were used to delineate any significant result from the ANOVA. Finally, simple multiple regression analyses were used to assess the independent contributions of each of the indices of academic functioning (i.e., relationship with academic advisor, research productivity, and funding) to depression symptoms as measured by the CES-D across all programme types. Similar regression analyses were performed for each of 1) the experimental students and 2) those training to provide therapeutic services (i.e., clinical, counselling, education programmes). The distinction in assessment was made *a priori* to evaluate whether there were differences in variable relationships based on those planning for a career primarily in research and those planning a therapy-oriented career.

## Results

A cross-tabulation of the number and percentage of students reporting clinically significant depression symptoms suggested that a greater proportion of experimental students were experiencing significant symptoms; however, a chi-square analysis (student group by symptom severity) indicated that this difference was not significant,  $\chi^2(3) = 3.94$ , *ns*, *V* = .12 (see Table 1). The cell sizes for the counselling and education students who exceeded the stringent cutoff score for the CES-D (i.e., >33) within the chi-square analyses (student group by symptom severity) were potentially problematically small; however, no significant differences were found when analyses were performed with only those students with scores of less than 33,  $\chi^2(6) = 4.05$ , *ns*, *V* = .05, or only the clinical and experimental students,  $\chi^2(3) = 4.17$ , *ns*, *V* = .05. The descriptive statistics from the sample for each of the indices of academic functioning are presented in Table 2. The

values associated with the demographics and productivity are generally comparable to and representative of those reported by students who were in the Association of Psychology Postdoctoral and Internship Centers' Matches from 2008, 2009, 2010 (Association of Psychology Postdoctoral and Internship Centers, 2010). Most of the Pearson's correlations were statistically significant (see Table 2). The relationships between advisory relationship items were all moderate (Cohen, 1988); however, in the current investigation we sought to be more thorough by assessing each aspect of the relationship independently. As expected, the skew and kurtosis for productivity as measured by publications and posters/symposia presentations were notably high (i.e., had positive standardized skewness values that exceeded 2 or positive standardized kurtosis values that exceeded 7 (Curran, West, & Finch, 1996; Tabachnick & Fidell, 2001). Consideration was given to logarithmic transformation; however, this would have excluded all persons with zero publications (43%) or zero posters/symposia presentations (19%) from subsequent analyses. Accordingly, the values were left untransformed. Frequency values have been presented to further characterise the sample (see Table 3).

There were no significant differences in reported levels of depression symptoms based on current degree programme (i.e., master's, direct-entry doctoral, doctoral),  $F(2, 291) = 1.62$ , Welch  $F(2, 144.49) = 1.54$ , *ns*,  $\eta^2 < .001$ , and as such, degree programme was not included as a factor in subsequent analyses. There were also no statistically significant differences (two-tailed) between men and women on the indices of academic functioning, even without corrections for multiple comparisons (*ps* = *ns*,  $r^2$ s < .01). There was one trend, wherein men appeared to be slightly older than women,  $t(283) = 1.79$ ,  $p = .07$ ,  $r^2 = .01$ . Given the absence of significant sex differences, men and women were pooled for the subsequent analyses. The substantially different sample sizes within each of the symptoms groups, while not prohibitive for ANOVA, does make meeting the assumption of homogeneity of variance more important (Tabachnick & Fidell, 2001); however, even if violated, a Welch correction can be employed along with discriminating post hoc tests to ensure any statistically significant differences are likely to be robust (Judd, McClelland, & Culhane, 1995; Tabachnick & Fidell, 2001). The assumption of homogeneity was violated ( $p < .05$ ) only for age ( $p < .01$ ); however, for the sake of thoroughness, the Welch corrections have been presented for all *F* values. The ANOVA revealed statistically significant differences between programme types on age,  $F(3, 287) = 4.52$ ,  $p < .01$ ,  $\eta^2 = .05$ ; current funding,  $F(3, 287) = 4.04$ ,  $p < .01$ ,  $\eta^2 = .04$ ; and current weekly hours worked,  $F(3, 287) = 3.90$ ,  $p < .01$ ,  $\eta^2 = .04$ . There was

Table 1  
*Clinically Relevant Depression Symptoms*

	CES-D < 17	CES-D > 16	CES-D < 34	CES-D > 33	Totals
Clinical	101 (71%)	41 (29%)	136 (96%)	6 (4%)	142
Experimental	65 (61%)	42 (39%)	99 (93%)	8 (7%)	107
Counselling	15 (75%)	5 (25%)	19 (95%)	1 (5%)	20
Education	14 (61%)	9 (39%)	20 (87%)	3 (13%)	23
Totals	195 (67%)	97 (33%)	274 (94%)	18 (6%)	292

Note. CES-D = Center for Epidemiologic Studies Depression Scale.

Table 2  
Sample Descriptive Statistics and Intervi-  
variable Correlations

	Min	Max	M (SD)	Median	Mode	S (.14)	K (.29)	CES-D Total	1	2	3	4	5	6	7	8	9
CES-D Total	0	54	14.36 (10.88)			1.00	0.69										
1. Age	21	57	27.69 (4.57)	27	26	2.33	8.56	-.02									
2. How would you rate the quality of your relationship with your academic advisor?	1	5	3.82 (1.04)	2	4	-.60	-.44	-.10	<.01								
3. How important do you feel you are to your academic advisor?	1	5	3.33 (1.00)	2	3	-.49	-.06	-.10	-.07	.61**							
4. How important to you is your relationship with your academic advisor?	1	5	4.02 (.79)	3	4	-.71	.83	<.01	<.01	.39**	.54**						
5. How satisfied are you with the quality of the mentorship you receive from your academic advisor?	1	5	3.43 (1.15)	2	3	-.47	-.53	-.19**	-.01	.72**	.66**	.48**					
6. Total Journal Publications	0	20	1.57 (2.37)	1	0	3.22	16.52	-.02	.09	.08	.02	.14*	.08				
7. Total Posters and Symposium Presentations	0	55	6.10 (7.51)	4	0	2.65	9.85	-.01	.09	.12*	.06	.08	.12*	.54**			
8. Current Funding (\$)	0	84000	20503 (16948)	19000	0	.70	.16	-.09	-.15*	.17**	.15*	.18**	.16**	.21**			
9. Current Hours Worked per Week	9	110	50.13 (19.17)	49	20	.36	.17	.09	-.08	.05	.05	.11*	.06	.17**	.18**	.17**	
10. Years in Graduate School	1	8	3.33 (1.98)	3	1	.73	-.29	-.09	.43**	.08	-.07	-.13*	.06	.30**	.38**	-.12*	.01

Note. All correlations were bi-directional.  
\*  $p < .05$  — \*\*  $p < .01$  —

also a trend indicating some differences between programme types on CES-D scores,  $F(3, 287) = 2.52$ ,  $p = .06$ ,  $\eta^2 = .03$ . More specifically, students in education reported the highest depression scores, followed by experimental, counselling, and finally clinical students. Following Tukey post hoc tests, the significant between-groups differences were found most often when comparing the clinical, experimental, and educational psychology programmes (see Table 4). The comparative analyses demonstrated significant differences between clinical and experimental students on one hand and education students on the other—counselling students typically fell in between the clinical and experimental students on depression scores.

The first multiple regression was calculated across the programme types, the second regression was calculated using only data from the experimental students, and the third regression was calculated using only data from the clinical, counselling, and education psychology programmes. The results indicated that student satisfaction with their advisory relationship and current weekly hours worked were significant predictors of depression symptoms, but only for experimental programme students (see Table 5). Specifically, a decrease in satisfaction with the advisory relationship was associated with an increase in depression,  $p < .05$ , and there was a trend ( $p = .06$ ) suggesting that increased hours worked per week was associated with increased depression. None of the indices of academic functioning accounted for statistically significant portions of variance on CES-D scores for students in the clinical, counselling, and education psychology programmes.

## Discussion

Converging evidence suggests that the multiple stressors endemic to university life, such as academic pressure, financial strain, and social adjustment, may contribute to vulnerability to emotional disorders (Westefeld & Furr, 1987). Accordingly, university students represent a group of individuals who appear to be particularly vulnerable for developing depression symptoms. Depression symptoms may exacerbate other co-occurring disorders (e.g., substance abuse), thereby resulting in more pervasive and diffuse impairment in university students (Floyd, 1991).

The deleterious effects of depression have been documented in undergraduate populations (Garlow et al., 2008); however, research on graduate students, particularly those in psychology, has been limited. The current study provided potentially important insights to fill the research gap by examining depression among psychology graduate students and across psychology graduate programmes. This is more than an epidemiological investigation, and its findings help to elucidate the relationship between depression and other areas relevant to graduate psychology students' academic functioning, such as funding, productivity, and academic advisory relationships.

The mental health and coping of psychologists who provide clinical services should present a significant concern, given that burnout and stress have been shown to impair a psychologist's ability to empathize with clients, to increase apathy toward clients, and to result in depersonalization of the client (Skorupa & Agresti, 1993). Consistent with prior research (Holzman et al., 1996), results of the present investigation indicated that a substantial proportion (33%) of psychology graduate students reported clinical



Table 3  
Frequencies

Age		Total Journal Publications		Total Posters and Symposium Presentations		Current Funding (\$)		Current Hours Worked per Week		Years in Graduate School		1 <sup>a</sup>		2 <sup>b</sup>		3 <sup>c</sup>	4 <sup>d</sup>
Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	%	%
21	.3	0	42.8	0	18.8	0	14	<13	2	1	20.5	Substantially Worse	1.7	Not at all	5.8	.7	7.2
22	1.4	1	23.6	1	7.2	<4,001	8.6	14–18	2.3	2	20.2	Worse	11.3	A little	12	2.7	13.4
23	6.9	2	11	2	9.9	4,001–8,000	8.9	19–24	4	3	19.5	Same	20.9	Somewhat	34.9	17.8	26.2
24	13.9	3	8.9	3	11.6	8,001–12,000	5.5	25–29	4.8	4	14	Better	35.6	Very	38	51.4	34.8
25	14.2	4	4.5	4	8.6	12,001–16,000	8	30–34	8.8	5	11.3	Substantially Better	30.5	Extremely	9.2	27.4	18.3
26	10.4	5	3.4	5	5.5	16,001–20,000	6.6	35–39	5.2	6	4.5						
27	11.5	6	2.1	6	6.8	20,001–24,000	5.4	40–44	9.3	7	5.5						
28	11.5	7	1.7	7	5.8	24,001–28,000	11.4	45–49	12	8	4.5						
29	6.9	8	.7	8	4.1	28,001–32,000	4.6	50–54	12.1								
30	5.2	9		9	1.7	32,001–36,000	5.9	55–59	9								
31	4.9	10	.3	10	2.4	36,001–40,000	4.9	60–64	6.5								
32	2.1	11		11	.7	40,001–44,000	5.4	65–69	6.2								
33	2.1	12		12	3.1	44,001–48,000	2.4	70–74	5.7								
34	2.1	13	.3	13	1.4	48,001–52,000	2.3	75–79	1.9								
35	1.4	14	.3	14	1.4	52,001–56,000	0.3	80–84	1.9								
36	.7	15		15	2.1	56,001–60,000	1.3	85–89	1.7								
37	.7	16		16	1.4	60,001–64,000	.3	90–94	1.6								
38	.7	17		17	.7	64,001–68,000	.6	95–99	.7								
41	1.0	18		18	1.4	68,001–72,000		100–104	1.3								
42	.3	19		19	.3	72,001–74,000		105–109									
44+	1.5	20+	.3	20+	4.9	74,001 +	.6	110–114	.3								

<sup>a</sup> How would you rate the quality of your relationship with your academic advisor? <sup>b</sup> How important do you feel you are to your academic advisor? <sup>c</sup> How important to you is your relationship with your academic advisor? <sup>d</sup> How satisfied are you with the quality of the mentorship you receive from your academic advisor?

cally significant symptoms of depression. Moreover, 6% of the current sample reported depressive symptoms consistent with significant clinical impairment. The rates of depression found in this study exceed the population prevalence rates of 12.3% (Kessler et al., 2003), while also exceeding existing rates for other university samples (i.e., 11.3%; Eisenberg et al., 2007). The rates also are elevated relative to other health care providers; for example, prior research demonstrated relatively lower rates of depression for medical students (i.e., 13%; Dahlin, Joneborg, & Runeson, 2005) and nursing students (i.e., 25.4%; Williams, Hagerty, Murphy-Weinberg, & Wan, 1995). Although there is evidence of substantial depression among health care providers in general (Haddad, Walters, & Tylee, 2007), psychology graduate students appear particularly prone.

The prevalence of depression symptoms here suggests attention is warranted not only to study the psychology graduate students' experiences, but also to determine the driving factors behind these heightened levels of depression. The current data provided support for the importance of being satisfied with one's academic advisor and of having sufficient funding. The importance of these factors is intuitive, given the central role that an academic advisor and availability of funding will play in the graduate student's life (Royalty, Gelso, Mallinckrodt, & Garrett, 1986). Academic advisors are typically responsible for a student's thesis or dissertation, and can also act as a student's clinical supervisor. Advisors also exert indirect influence on funding by affecting a student's pro-

spective financial and professional opportunities. Specifically, federal funding agencies and clinical placements almost invariably require a letter of support from the student's academic advisor, making the relationship one of critical importance to the student. Accordingly, the student's perceived satisfaction with his or her advisory relationship was negatively associated with self-reported depressive symptoms.

The importance of funding for subsistence (e.g., income) and professional success (e.g., travel for conferences, interviews) is intuitive; however, two important caveats are required when interpreting the impact of the advisory relationship and funding that was observed in this study. First, these two factors only accounted for significant variance in depression symptoms experienced by experimental students (those planning for a career primarily in research) and not by students planning a clinically oriented career. This difference for experimental students may, in part, be a reflection of the centrality of the supervisor for experimental students. Given the strict focus on research, the supervisor assumes a much more integral role in the experimental student's academic life, as compared to the clinical student's academic life (Peluso, Carleton, Richter, & Asmundson, in press). Second, the two factors accounted for slightly less than one fifth of the variance. Findings that hours worked per week are not inversely related to depression symptoms were somewhat surprising, given prior research suggesting that feelings of entrapment (e.g., overwhelming and inescapable work) contribute to depression symptoms in students

Table 4  
ANOVAs

						<i>M (SD)</i>			
	<i>F</i>	<i>p</i>	<i>Welch F</i>	<i>p</i>	<i>eta</i> <sup>2</sup>	Clinical ( <i>n</i> = 142)	Experimental ( <i>n</i> = 107)	Counselling ( <i>n</i> = 20)	Education ( <i>n</i> = 23)
CES-D Total	2.52	.06	2.36	.08	.03	12.70 (10.11)	15.90 (10.91)	14.20 (12.31)	17.57 (12.87)
Age	4.52	<.01	3.04	.04	.05	27.68 <sup>a</sup> (4.42)	26.86 <sup>a</sup> (3.83)	29.15 <sup>a,b</sup> (5.43)	30.30 <sup>b</sup> (6.46)
How would you rate the quality of your relationship with your academic advisor?	.25	.86	.26	.86	<.01	3.78 (1.02)	3.89 (1.01)	3.75 (1.02)	3.78 (1.38)
How important do you feel you are to your academic advisor?	.96	.41	.86	.47	.01	3.28 (.98)	3.45 (.98)	3.25 (.85)	3.13 (1.29)
How important to you is your relationship with your academic advisor?	1.22	.30	1.14	.34	.01	3.96 (.78)	4.13 (.81)	4.00 (.65)	3.87 (.81)
How satisfied are you with the quality of the mentorship you receive from your academic advisor?	1.10	.35	.79	.51	.01	3.44 (1.11)	3.49 (1.15)	3.60 (.94)	3.04 (1.46)
Total Journal Publications	.98	.40	1.43	.24	.01	1.44 (1.88)	1.79 (2.90)	.95 (1.39)	1.78 (2.88)
Total Posters and Symposium Presentations	1.97	.12	2.83	.05	.02	6.98 (8.36)	5.82 (6.31)	4.05 (9.08)	3.74 (4.36)
Current Funding (\$)	4.04	.01	6.79	<.01	.04	21978 <sup>a</sup> (17198)	21797 <sup>a</sup> (16688)	13835 <sup>a,b</sup> (18464)	11184 <sup>b</sup> (10668)
Current Hours Worked per Week	3.90	.01	3.92	.01	.04	48.84 (19.05)	54.05 (18.97)	42.80 (19.04)	44.13 (17.36)
Years in Graduate School	2.15	.09	2.29	.09	.02	3.61 (2.16)	3.01 (1.62)	2.95 (1.61)	3.43 (2.41)

Note. CES-D = Center for Epidemiologic Studies Depression Scale. Across columns, means with different superscripts are statistically significantly different after Tukey post hoc tests ( $p < .05$ ).

(Sturman & Mongrain, 2008; Vazquez & Blanco, 2008; Westefeld & Furr, 1987). Although students may work long hours for reasons other than entrapment, an association between hours worked and depression was expected. As such, depression symptoms in psychology graduate students appear related either to individual differences or to other unmeasured variables associated with psychology graduate programmes. If the symptoms are related to individual differences, there may be broader implications for mental health as a profession (Hysenbegasi et al., 2005), such as therapy or increased screening criteria. Alternatively, if the symptoms are related to other unmeasured variables associated with psychology graduate programmes, those variables should be identified in order to mediate such depressive influences. Longitudinal research appears to be necessary for evaluating such possibilities.

As might be expected, age and productivity were moderately positively correlated with years as a graduate student. There was a small, but significant negative correlation between years as a graduate student and current funding, which may be the result of insufficient funding during the final year of study because of scholarship and grant restrictions. The number of years as a graduate student were also positively correlated with relationship quality and satisfaction, but negatively correlated with importance; however, only one item, "How important to you is your relationship with your academic advisor?" was significant, and just barely so with a relatively small correlation. Perhaps satisfaction and quality of the relationship increase as a function of time, given that there would be more interactions across different situations, resulting in greater comfort and mutual understanding between members of the dyad.

### Limitations

There are several limitations in the current study that also provide directions for future research. First, depression symptoms were measured by self-report rather than clinical interview; how-

ever, the limitation is mitigated by the generally accepted quality of the CES-D as a clinical screen (Radloff, 1977). That being said, high levels of CES-D do not necessarily denote diagnosis of depression (Coyne & Schwenk, 1997) and the relationship between elevated scores on self-report measures and clinical diagnosis of depression can be tenuous, especially among university samples (Coyne, 1994; Roberts et al., 1991). Future research of this nature should consider using clinical interviews to augment self-report measures. Second, previous episodes of depression were not taken into account. Once an individual experiences a depressive episode, the likelihood of experiencing a recurrence is approximately 60% (American Psychiatric Association, 2000). In a similar vein, other vulnerability factors, such as family history of depression, were not assessed. Consequently, it is difficult to discern what peripheral factors, if any, contributed to the presence of self-reported depressive symptoms. Subsequent research could include pre-, during, and postgraduate school assessments of depression symptoms. Charting the course of depression over the academic life span of graduate students via such longitudinal studies may provide critical insights into which aspects of graduate school contribute to depression (e.g., burnout, nonsupportive academic climate, clinical work). Similarly, it may be helpful to measure goals and motivations across time, as those may contribute to changes in mood and satisfaction. Third, the relatively high rates of comorbidity between depression, anxiety, and other emotional disorders (Roy-Byrne et al., 2005) suggests that researchers should consider including broader assessments in subsequent studies. Fourth, other symptoms, such as anxiety, and personality factors, such as extraversion, were not assessed. Such assessments may provide critical insights into individual differences that may facilitate vulnerabilities for depression. Future research should consider including such measures. Fifth, given how little of the variance was accounted for by indices of academic performance included in the present study (i.e., advisory relationships, produc-

Table 5  
Regressions

	Coefficient Statistics				Statistics		
	$\beta$	$t$	$p$	$part\ r$	$\Delta R^2$	$\Delta F$	$P$
CES-D All Programmes (Constant)		2.66	<.01				
Age	.01	.10	>.10	.01	.07	2.15	<.05
How would you rate the quality of your relationship with your academic advisor?	.07	.81	>.10	.05			
How important do you feel you are to your academic advisor?	.05	.56	>.10	.03			
How important to you is your relationship with your academic advisor?	.11	1.51	>.10	.09			
How satisfied are you with the quality of the mentorship you receive from your academic advisor?	.24	2.59	<.01	.15			
Total Journal Publications	.03	.35	>.10	.02			
Total Posters and Symposium Presentations	.07	.90	>.10	.05			
Current Funding (\$)	.12	1.92	.06	.11			
Current Hours Worked per Week	.11	1.79	.07	.10			
Years in Graduate School	.11	1.46	>.10	.08			
CES-D Experimental Programme (Constant)		1.82	.07				
Age	.06	.53	>.10	.05	.22	2.55	<.01
How would you rate the quality of your relationship with your academic advisor?	.10	.69	>.10	.06			
How important do you feel you are to your academic advisor?	.08	.64	>.10	.06			
How important to you is your relationship with your academic advisor?	.19	1.70	.09	.16			
How satisfied are you with the quality of the mentorship you receive from your academic advisor?	.35	2.45	<.05	.23			
Total Journal Publications	.03	.28	>.10	.03			
Total Posters and Symposium Presentations	.14	1.07	>.10	.10			
Current Funding (\$)	.27	2.72	<.01	.25			
Current Hours Worked per Week	.19	1.91	.06	.18			
Years in Graduate School	.02	.16	>.10	.02			
CES-D Non-Experimental Programmes (Constant)		1.99	.05				
Age	.06	.69	.49	.05	.04	.66	>.10
How would you rate the quality of your relationship with your academic advisor?	.07	.60	.55	.05			
How important do you feel you are to your academic advisor?	.08	.63	.53	.05			
How important to you is your relationship with your academic advisor?	.03	.32	.75	.02			
How satisfied are you with the quality of the mentorship you receive from your academic advisor?	.12	.98	.33	.07			
Total Journal Publications	.06	.58	.56	.04			
Total Posters and Symposium Presentations	.03	.33	.74	.03			
Current Funding (\$)	.03	.39	.70	.03			
Current Hours per Week	.05	.64	.52	.05			
Years in Graduate School	.13	1.39	.17	.11			

Note. CES-D = Center for Epidemiologic Studies Depression Scale

tivity, funding, hours worked), other factors need to be considered. A qualitative analysis of the subjective experience of being a psychology student would provide a significant supplement to the knowledge base in this area. Sixth, given the method of data collection (i.e., open invitation to participate), we have no way of knowing how many people refused to participate. Seventh, there is a possibility of sampling bias in the study; specifically, a self-selection bias to participate by graduate students who were feeling depressed. Finally, the indices of academic productivity were not weighted (i.e., the value of posters, manuscripts, symposia relative to each other were not delineated), making quantification of productivity difficult.

### Conclusion

The current results suggest that satisfaction with the academic advisory relationship and access to funding is of particular importance to the mental health of experimental psychology students. Adverse effects of a poor relationship or insufficient funding appear to extend beyond the academic

boundary, thereby contributing to the presence of symptoms that affect students more diffusely. The pervasive low mood and self-esteem associated with depression are likely to affect areas outside the academic sphere, such as a student's interpersonal relationships. Such associations further underscore the importance, both for the student and the advisor, of working toward a healthy and functional advisory relationship. The relatively high incidence of depression seen in all programme types further highlights the need for programmes and students to be vigilant in supporting and engaging in appropriate self-care. Programme directors may also find it prudent to incorporate psychoeducation regarding the relatively higher rates of depression symptoms into curricula. Promoting openness and help-seeking for mental health concerns may be decidedly important with clinical and counselling students, since these individuals may be reticent to seek help in the community where they may also be placed for clinical training. Finally, the absence of information about graduate psychology student depression symptoms underscores the need for subsequent research.

## Résumé

La dépression est un des troubles mentaux les plus communs chez les étudiants universitaires (Rimmer, Halikas & Schuckit, 1982; Vazquez & Blanco, 2008); toutefois, les étudiants de premier cycle ont fait l'objet de la plupart des études. Les quelques données auprès des étudiants gradués suggèrent qu'ils pourraient aussi être vulnérables à la dépression (Eisenberg, Gollust, Golberstein & Hefner, 2007). La présente étude fournit des données initiales sur les symptômes dépressifs d'étudiants canadiens gradués en psychologie. Les participants incluent des étudiants de partout à travers le Canada ( $N = 292$ , 87 % de femmes) inscrits dans les programmes clinique, expérimental, d'orientation ou d'éducation. Chaque participant a complété la *Center for Epidemiological Studies Depression Scale* (CES-D; Radloff, 1977) ainsi que des mesures de : financement, productivité de la recherche, nombre d'heures travaillées et relation avec le superviseur. Une importante proportion d'étudiants (33 %) ont rapporté des symptômes dépressifs cliniquement significatifs ( $CES-D > 16$ ), avec une minorité significative rapportant des symptômes dépressifs sévères et des déficits. Il n'y avait pas de différence entre les programmes quant aux symptômes rapportés; toutefois, les résultats des analyses de régression ont indiqué que la satisfaction à l'égard de la relation avec le superviseur et le nombre d'heures de travail hebdomadaires constituaient des prédicteurs significatifs des symptômes dépressifs chez les étudiants inscrits au programme expérimental. À l'inverse, les symptômes dépressifs n'étaient pas associés au financement, à la productivité de la recherche, aux heures travaillées et à la satisfaction à l'égard de la relation avec le superviseur chez les étudiants des autres programmes. Les implications et les directions futures pour la recherche sont discutées.

**Mots-clés :** étudiants gradués en psychologie, dépression, productivité de la recherche, financement des étudiants gradués, relation avec le superviseur

## References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.
- Association of Psychology Postdoctoral and Internship Centers. (2010). Retrieved from [http://www.appic.org/match/5\\_2\\_2\\_match\\_about\\_statistics.html](http://www.appic.org/match/5_2_2_match_about_statistics.html)
- Beck, K. H., Arria, A. M., Caldeira, K. M., Vincent, K. B., O'Grady, K. E., & Wish, E. D. (2008). Social context of drinking and alcohol problems among college students. *American Journal of Health Behavior*, 32, 420–430.
- Boyd, J. H., Weissman, M. M., Thompson, W. D., & Myers, J. K. (1982). Screening for depression in a community sample. Understanding the discrepancies between depression symptom and diagnostic scales. *Archives of General Psychiatry*, 39, 1195–1200.
- Brown, G., Harris, T., & Hepworth, C. (1995). Loss, humiliation, and entrapment among women developing depression: A patient and non-patient comparison. *Psychological Medicine*, 25, 7–21.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Mahwah, NJ: Erlbaum.
- Coyne, J. C. (1994). Self-reported distress: Analog or Ersatz depression? *Psychological Bulletin*, 116, 29–45.
- Coyne, J. C., & Schwenk, T. L. (1997). The relationship of distress to mood disturbance in primary care and psychiatric populations. *Journal of Consulting and Clinical Psychology*, 65, 161–168.
- Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods*, 1, 16–29.
- Dahlin, M., Joneborg, N., & Runeson, B. (2005). Stress and depression among medical students: A cross-sectional study. *Medical Education*, 39, 594–604.
- Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry*, 77, 534–542.
- Feist, G. (1997). Quantity, quality, and depth of research as influences on scientific eminence: Is quantity most important? *Creativity Research Journal*, 10, 325–335.
- Floyd, J. A. (1991). Nursing students' stress levels, attitude toward drugs, and drug use. *Archives of Psychiatric Nursing*, 5, 46–53.
- Garlow, S. J., Rosenberg, J., Moore, J. D., Haas, A. P., Koestner, B., Henden, H., & Nemeroff, C. B. (2008). Depression, desperation, and suicidal ideation in college students: Results from the American foundation for suicide prevention college screening project at Emory University. *Depression and Anxiety*, 25, 482–488.
- Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about internet questionnaires. *American Psychologist*, 59, 93–104.
- Haddad, M., Walters, P., & Tylee, A. (2007). District nursing staff and depression: A psychometric evaluation of Depression Attitude Questionnaire findings. *International Journal of Nursing Studies*, 44, 447–456.
- Holzman, L. A., Searight, H. R., & Hughes, H. M. (1996). Clinical psychology graduate students and personal psychotherapy: Results of an exploratory study. *Professional Psychology: Research and Practice*, 27, 98–101.
- Hysenbegasi, A., Hass S. L., & Rowland, C. R. (2005). The impact of depression on the academic productivity of university students. *Journal of Mental Health Policy Economics*, 8, 145–151.
- Judd, C. M., McClelland, G. H., & Culhane, S. E. (1995). Data analysis: Continuing issues in the everyday analysis of psychological data. *Annual Review of Psychology*, 46, 433–465.
- Kendler, K. S., Hettema, J. M., Butera, F., Gardner, C. O., & Prescott, C. A. (2003). Life event dimensions of loss, humiliation, entrapment, and danger in the prediction of major depression and generalized anxiety. *Archives of General Psychiatry*, 60, 789–796.
- Kessler, R. C. (1997). The effects of stressful life events on depression. *Annual Review of Psychology*, 48, 191–214.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Koretz, D., & Merikangas, K. R., . . . Wang, P. S. (2003). The epidemiology of major depressive disorder: Results from the national comorbidity survey replication (NCS-R). *Journal of the American Medical Association*, 289, 3095–3105.
- Lee, A. S. (2009). Does empathy mediate the relationship between neuroticism and depressive symptomatology among college students? *Personality and Individual Differences*, 47, 429–433.
- Matson, J. L., Malone, C. J., Gonzalez, M. L., McClure, D. R., Laud, R. B., & Minshawi, N. F. (2005). Clinical psychology Ph. D. programs rankings: Evaluating eminence on faculty publications and citations. *Research in Developmental Disabilities*, 26, 503–513.
- Mongrain, M., & Blackburn, S. (2005). Cognitive vulnerability, lifetime risk, and the recurrence of major depression in graduate students. *Cognitive Therapy and Research*, 29, 747–768.
- Mongrain, M., & Leather, L. (2006). Immature dependence and self-criticism predict the recurrence of major depression. *Journal of Clinical Psychology*, 62, 705–713.
- Peluso, D. L., Carleton, R. N., & Asmundson, G. J. G. (2010). Clinical psychology graduate students' perceptions of their scientific and practical training: A Canadian perspective. *Canadian Psychology*, 51, 133–139.
- Peluso, D. L., Carleton, R. N., Richter, A. A., & Asmundson, G. J. G. (in



- press). The graduate advising relationship in Canadian psychology programmes: Advisee perspectives. *Canadian Psychology*.
- Price, E. L., McLeod, P. J., Gleich, S. S., & Hand, D. (2006). One-year prevalence rates of major depressive disorder in first-year university students. *Canadian Journal of Counselling*, 40, 68–81.
- Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Rimmer, J., Halikas, J. A., & Schuckit, M. A. (1982). Prevalence and incidence of psychiatric illness in college students: A four year prospective study. *Journal of American College Health*, 30, 207–223.
- Roberts, R. E., Lewinsohn, P. M., & Seeley, J. R. (1991). Screening for adolescent depression: A comparison of depression scales. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 58–66.
- Royalty, G. M., Gelso, C. J., Mallinckrodt, B., & Garrett, K. (1986). The environment and the student in counseling psychology: Does the research training environment influence graduate students' attitudes toward research? *The Counseling Psychologist*, 14, 9–30.
- Roy-Byrne, P. P., Craske, M. G., Stein, M. B., Sullivan, G., Bystrisky, A., Katon, W., . . . Sherbourne, C. D. (2005). A randomized trial of cognitive behavior therapy and medication for primary care panic disorder. *Archives of General Psychiatry*, 62, 290–298.
- Santor, D. A., Zuroff, D. C., Ramsay, J. O., Cervantes, P., & Palacios, J. (1995). Examining scale discriminability in the BDI and CES-D as a function of depressive severity. *Psychological Assessment*, 7, 131–139.
- Schlosser, L. Z., & Gelso, C. J. (2001). Measuring the working alliance in advisor–advisee relationships in graduate school. *Journal of Counseling Psychology*, 48, 157–167.
- Schlosser, L. Z., Knox, S., Moskovitz, A. R., & Hill, C. E. (2003). A qualitative examination of graduate advising relationships: The advisee perspective. *Journal of Counseling Psychology*, 50, 178–188.
- Skorupa, J., & Agresti, A. A. (1993). Ethical beliefs about burnout and continued professional practice. *Professional Psychology: Research and Practice*, 24, 281–285.
- Stewart-Brown, S., Evans, J., Patterson, S., Peterson, S., Doll, H., Balding, J., & Regis, D. (2000). The health of students in institutes of higher education: An important and neglected public health problem? *Journal of Public Health Medicine*, 22, 492–499.
- Sturman, E., & Mongrain, M. (2008). Entrapment and perceived status in graduate students experiencing a recurrence of major depression. *Canadian Journal of Behavioural Science*, 40, 185–188.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). New York: Harper and Row.
- Vazquez, F. L., & Blanco, V. (2008). Prevalence of *DSM-IV* major depression among Spanish university students. *Journal of American College Health*, 57, 165–171.
- Wells, A. (2009). *Metacognitive therapy for anxiety and depression*. New York: Guilford Press.
- Westefeld, J. S., & Furr, S. R. (1987). Suicide and depression among college students. *Professional Psychology: Research and Practice*, 18, 119–123.
- Williams, R. A., Hagerty, B. M., Murphy-Weinberg, V., & Wan, J. Y. (1995). Symptoms of depression among female nursing students. *Archives of Psychiatric Nursing*, 9, 269–278.

Received June 18, 2010

Revision received November 4, 2010

Accepted November 8, 2010 ■

### E-Mail Notification of Your Latest CPA Issue Online!

Would you like to know when the next issue of your favorite Canadian Psychological Association journal will be available online? This service is now available. Sign up at <http://notify.apa.org/> and you will be notified by e-mail when issues of interest to you become available!

### Avis par courriel de la disponibilité des revues de la SCP en ligne!

Vous voulez savoir quand sera accessible en ligne le prochain numéro de votre revue de la Société canadienne de psychologie préférée? Il est désormais possible de le faire. Inscrivez-vous à <http://notify.apa.org/> et vous serez avisé par courriel de la date de parution en ligne des numéros qui vous intéressent!