

**THE INFLUENCES OF SEX, GENDER IDENTITY, AND POWER ON
FACULTY-GRADUATE STUDENT RELATIONAL MENTORING AND ITS
ASSOCIATION WITH STUDENT PSYCHOLOGICAL HEALTH**

by

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Abstract

Evidence suggests that university student psychological health problems may be increasing, and graduate students may be at increased risk for problems such as depression relative to the general population. The limited extant research has identified a correlation between relational mentoring characterized by mutual authenticity, engagement, and empowerment, and female undergraduate student psychological health. The current research fills gaps in the mentoring and feminist psychological literatures by examining this correlation in faculty-graduate student mentoring and testing key assumptions of relational-cultural theory, from which the concept of relational mentoring is derived. Relational-cultural theory assumes: 1) relational mentoring is more important to the psychological health of women than men, and 2) women are more likely than men to adopt a relationship style that would foster relational mentoring. This research was also informed by feminist critiques of these assumptions. Consequently, using a survey of 421 graduate students from various disciplines across Canada, Study 1 examined the association between faculty-graduate student relational mentoring and psychological health outcomes. Study 1 further tested the moderating effects of student sex, gender identity (i.e., masculine, feminine traits), and the power dynamics of the individual faculty-student relationships. A significant correlation was observed between relational mentoring and positive psychological health (i.e., decreased depressive symptoms, increased self-esteem and life satisfaction). This association was not moderated by student sex, gender identity, or relationship power dynamics. Using an online, experimental design and a sample of 186 undergraduate students, Study 2 examined the effects of sex, gender identity, and a randomly assigned power condition (i.e., high-power

faculty mentor versus low-power student) on relationship styles in mentoring. Sex and gender identity influenced mentoring relationship styles (i.e., female participants and those with more feminine traits were associated with greater authenticity, engagement, and empowerment), and a notable interaction emerged. Specifically, sex differences in relationship style were observed in the high-power faculty mentor condition (i.e., female mentors were more authentic, engaged, empowering) but not the low-power student condition. Collectively, the results provide mixed support for relational-cultural theory. The results may be used to guide faculty-graduate student mentoring practices (e.g., student selection of mentors) to enhance graduate student psychological health.

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**The Influences of Sex, Gender Identity, and Power on Faculty-Graduate Student
Relational Mentoring and its Association with Student Psychological Health**

Chapter 1: General Introduction

Graduate school can be a stressful experience for many students. Despite the strict qualifications required to enter graduate programs, many graduate students fail to complete their degrees (Smallwood, 2004) and among those who complete their degrees, the process can still be lengthy (Glenn, 2010). Additionally, reports indicate that not only are student psychological health problems on the rise (Clay, 2013) but existing prevalence estimates for anxiety and depressive disorders remain high (i.e., 13%) among American graduate students (Eisenberg, Gollust, Golberstein, & Hefner, 2007). Even more worrisome, recent research within Canada indicates that 33% of psychology graduate students report clinically significant depressive symptoms (Peluso, Carleton, & Asmundson, 2011). The impact of poor psychological health on students is clear but there can also be substantial costs to educational institutions, including the expenses of counseling services and costs to university health insurance plans (Kadison, 2004). In extreme cases involving student suicide, expensive lawsuits against educational institutions may result (Franke, 2004).

Research has demonstrated associations between faculty-graduate student mentoring and positive academic outcomes for students (e.g., research productivity, skill development, research self-efficacy; see Johnson, 2007, for a review), but research has yet to explore the impacts of faculty-graduate student mentoring on graduate student psychological health. Limited research with undergraduate students has revealed a correlation between relational mentoring (characterized by mutual authenticity,

engagement and empowerment) and students' positive psychological health (Liang, Tracy, Taylor, & Williams, 2002a). Liang et al.'s (2002a) research was grounded in both the mentoring literature and feminist psychological theory. The current research was designed to extend Liang et al.'s work to graduate students and their mentoring relationships with thesis advisors specifically. Thus, the current research was also grounded in both the mentoring and feminist psychological literatures. This chapter provides a general overview of theory and research on mentoring and a broad review of feminist psychological theory and research, building to a conclusion outlining the two present studies which address multiple gaps in the extant literatures through experimental and survey methodologies.

Theoretical Background

Conceptualizing Faculty-Graduate Student Mentoring

Mentoring research began in earnest in the late 1970s with Levinson, Darrow, Klein, Levinson, and McKee's (1978) qualitative study of adult male development (see Johnson, 2007, 2014; and Johnson, Rose, & Schlosser, 2007, for excellent reviews of the history of academic mentoring research). In Levinson et al.'s (1978) study, mentoring emerged as a critical part of early adulthood and was "defined not in terms of formal roles but in terms of the character of the relationship and the functions it serves" (p. 98). These functions included the following:

He may act as a teacher to enhance the young man's skills and intellectual development. Serving as sponsor, he may use his influence to facilitate the young man's entry and advancement. He may be a host and guide, welcoming the initiate into a new occupational and social world and acquainting him with its

values, customs, resources and cast of characters. Through his own virtues, achievements and way of living, the mentor may be an exemplar that the protégé can admire and seek to emulate. He may provide counsel and moral support in time of stress. (p. 98)

The most important function identified by Levinson et al. was “to support and facilitate the realization of the Dream” (p. 98). According to Levinson et al., mentors help protégés fulfill their dreams and develop new identities through encouragement and belief in their protégés, and the mentoring relationship becomes increasingly mutual as the protégé develops an identity with greater authority and capability.

Later, in the early 1980s, Kram’s (1983) qualitative research on mentoring relationships in the workplace divided mentoring functions into two types: 1) career functions aimed at career development (e.g., providing opportunities for challenging work, networking opportunities, advocacy), and 2) psychosocial functions aimed at enhanced self-efficacy and identity development (e.g., providing acceptance, friendship, role modeling, advice). Further, Kram’s (1983) qualitative research specified four phases (i.e., initiation, cultivation, separation, redefinition) through which mentoring relationships evolve as they become increasingly defined as peer relationships.

Workplace mentoring has been the focus of most of the research efforts since these early developments around thirty years ago (Johnson et al., 2007). Research on academic mentoring relationships has been described as scarce and in a “state of developmental adolescence” (Johnson et al., 2007, p. 62). Primary among the limitations of this literature are difficulties conceptualizing mentoring, particularly in contrast to other academic relationships (e.g., advising relationships, role modeling; Johnson et al.,

2007). Johnson (2002) defined the mentoring of graduate students and junior professionals in training in the following way:

Mentoring is a personal relationship in which a more experienced (usually older) faculty member or professional acts as a guide, role model, teacher, and sponsor of a less experienced (usually younger) graduate student or junior professional. A mentor provides the protégé with knowledge, advice, challenge, counsel, and support in the protégé's pursuit of becoming a full member of a particular profession. (p. 88)

Johnson's definition includes multiple mentoring functions and emphasizes the positive strength and intent of the relationship to develop a protégé's career. Experts in the field have differentiated between mentoring relationships and other supportive relationships based on these characteristics (Johnson et al., 2007). For example, Mertz (2004) categorized supportive relationships (e.g., role model, advisor, mentor) based on the underlying intent of the relationship and the level of involvement required. Further, Schlosser, Lyons, Talleyrand, Kim, and Johnson (2011) distinguished between academic advising and mentoring relationships on five dimensions: 1) advising relationships can be good, bad, or anything in between, while mentoring relationships are generally perceived as positive relationships (although there may be negative aspects to the overall positive relationships), 2) advising relationships may or may not involve professional development, while this is a focus of mentoring, 3) advising is a formal relationship, while mentoring can be informal or formal, 4) advising is limited to a student's department, while mentoring relationships can be formed in a much broader social circle, and 5) advising relationships are almost always a part of graduate school, while

mentoring relationships are less commonly reported. Although advising relationships can become mentoring relationships, not all advising relationships would meet the criteria listed above (Schlosser et al., 2011).

Recent theoretical developments have moved away from conceptualizing faculty-student mentoring as a *type* of relationship and have instead identified mentoring as a *quality* that can define a range of supportive relationships (Johnson, 2014). Johnson's (2014) mentoring relationship continuum (MRC) model of developmental relationships places relationships such as advising and supervising on a continuum of more or less mentoring quality. First, developmental relationships low in mentoring are described in the model as transactional (e.g., advisors providing students with focused training for financial compensation) whereas those high in mentoring are transformational (e.g., advisors being committed to their students' personal and professional success and inspiring students to transform their professional identities). Second, developmental relationships in the model include greater amounts of social support (e.g., emotional support, advice, assistance) as they move along the continuum towards greater mentoring. Third, developmental relationships higher in mentoring quality in the model are also characterized by greater intimacy and commitment. Finally, some developmental relationships may also foster mentoring relationship qualities that are characterized as relational mentoring, involving mutuality in impact and growth, flexibility in roles as experts and learners, mutual empathy and vulnerability, and a holistic approach that is intended to impact a wide range of personal and professional outcomes.

Johnson's (2014) discussion of the model focused specifically on those developmental relationships in the field of psychology, but conceivably these could be

extended to other disciplines and mentoring outside academia as well. In fact, his discussion of relational mentoring draws on Ragins' (2012) description of relational mentoring in the workplace.

Ragins' (2012) work was in turn, influenced by a feminist psychological theory, relational-cultural theory, and its concept of growth-fostering connections (e.g., Jordan, Kaplan, Miller, Stiver, & Surrey, 1991). Ten years earlier, Liang et al. (2002a) had found a significant correlation between relational mentoring and positive student psychological health outcomes (i.e., increased self-esteem, decreased loneliness). Thus, the concept of relational mentoring may be particularly important to research investigating the impact of faculty-graduate student mentoring on student psychological health, and understanding this concept is enhanced by a thorough review of relational-cultural theory.

Relational Mentoring and Relational-Cultural Theory

As discussed above, relational mentoring is a concept derived from relational-cultural theory (e.g., Jordan et al., 1991) that has been linked to positive student psychological health outcomes (Liang et al., 2002a). Relational-cultural theory essentially began with a book by Jean Baker Miller (1976), which criticized mainstream psychological theories of human development as excluding women's experiences. The theory developed through meetings of four key women (Jean Baker Miller, Irene Stiver, Judith Jordan, and Janet Surrey), which began in 1978, and through work conducted at the Stone Center of Wellesley College since 1981 and the Jean Baker Miller Training Institute since 1995 (Jordan, 2008). As the theory has developed it has been called self-in-relation theory (e.g., Jordan et al., 1991), relational theory or the relational model (e.g., Liang et al., 2002a) and finally, relational-cultural theory (RCT; e.g., Jordan, 2008).

RCT suggests an alternative to traditional theories of development focused on increasing separation and autonomy – that of growth within connection (e.g., Jordan et al., 1991). Further, the theory suggests that this alternative path to development is normally encouraged for girls but discouraged for boys (Miller, 1991a). In this alternative path to development, one's self-esteem and well-being become tied to one's involvement in relationships (Miller, 1991a), particularly involvement in relationships characterized by mutual authenticity, engagement, and empowerment (i.e., those characteristics measured in a scale commonly used in RCT research - the Relational Health Indices; Liang, Tracy, Taylor, Williams, Jordan & Miller, 2002b). Mutual authenticity describes a mutual increase in self-awareness and a mutual freedom to be oneself in the relationship, mutual empowerment describes increases in energy and strength experienced by both parties, and mutual engagement involves “mutual involvement, commitment, and attunement to the relationship” (Liang et al., 2002a, p. 274). It was these relational aspects of mentoring that were correlated with increases in student self-esteem and decreases in student loneliness in Liang et al.'s (2002a) research.

Miller (1986) emphasized the role that women's subordination played in the socialization of women to focus more on relationships. Essentially, Miller argued that women's low power and dependence on men led to survival strategies, including greater sensitivity to the feelings of others (particularly those in dominant groups) and greater effort in maintaining relationships, even to the point of sacrificing authenticity. Despite this theory of the dark origins of women's relational selves, RCT theorists have discussed the focus on relationships and growth within connection in its most positive form as a strength that should be developed and shared to benefit all:

In this sense, I believe women have an urgent and historic mission: to examine still more accurately the very realm of growth-fostering relationships which women have been trying to provide all along; to raise these to their full value, and thus, to move to redefine public visions and goals; to provide the leadership to move all of our societal structures away from systems based on violence and toward systems based on mutual empowerment. (Miller, 2008, p. 379)

Although much of the focus of RCT theory and research has been on women's experiences because of its feminist roots, RCT theorists have increasingly discussed the importance of development within connection for men as well (Frey, 2013). For example, Bergman (1995) argued that men also want connection and suffer from relationships that are not mutually empowering but have been socialized to disconnect from others and focus on achievement and independent actions. He even suggested that the classic "midlife crisis" may be a result of men's unmet needs to connect and grow through mutually empathic relationships. Thus, a desire for connection coupled with a fear of intimacy can lead men to focus on relationships with larger groups rather than intimate dyads (Bergman, 1995; Frey, Beesley, & Miller, 2006; Frey, Tobin, & Beesley, 2004). In summary, relational-cultural theory presents an alternative model of development, in which relationships are central to growth, and further suggests that women have been socialized to have more relational selves than men. This leads to two predictions about differences between women and men in relationships: 1) women's sense of self and well-being are more likely to be impacted by their relationships, at least in dyads, and 2) women are more likely to develop growth-fostering relationships (i.e.,

mutually authentic, engaging, empowering). These predictions help to situate the theory within the broader feminist literature and are important to critiques of the theory.

Psychoanalytic and cultural feminist perspectives. Relational-cultural theory's suggestion that women are more relational than men (e.g., Jordan, et al., 1991) is similar to theories proposed by psychoanalytic and cultural feminists, such as Nancy Chodorow and Carol Gilligan, respectively (see Tong, 1998, for a review of psychoanalytic and gender/cultural feminism). For example, Chodorow (1978) discussed the effects of early developmental experiences on the production of masculine and feminine personalities:

A psychoanalytic investigation shows that women's mothering capacities and commitments, and the general psychological capacities and wants which are the basis of women's emotion work, are built developmentally into feminine personality. Because women are themselves mothered by women, they grow up with the relational capacities and needs, and psychological definition of self-in-representation, which commits them to mothering. Men, because they are mothered by women, do not. Women mother daughters who, when they become women, mother. (p. 209)

Gilligan's 1982 book, *In a different voice: Psychological theory and women's development*, detailed a qualitative study of 29 women making decisions about whether to terminate their pregnancies. Gilligan's analysis indicated women's relational personalities were influencing their decisions and their moral development was distinctly feminine:

The sequence of women's moral judgment proceeds from an initial concern with survival to a focus on goodness and finally to a reflective understanding of care as

the most adequate guide to the resolution of conflicts in human relationships. The abortion study demonstrates the centrality of the concepts of responsibility and care in women's constructions of the moral domain, the close tie in women's thinking between conceptions of the self and of morality, and ultimately the need for an expanded developmental theory that includes, rather than rules out from consideration, the differences in the feminine voice. (p. 105)

A number of critiques have been levied at cultural and psychoanalytic feminist theories of sex differences in behaviour based on men's and women's stable masculine and feminine personalities (e.g., with women being and acting more relational). There are two critiques that are central to this study (see Tong, 1998, for a detailed review of other critiques; see also Kimball, 1994, for a general review of debates regarding gender difference theory and research). First, psychoanalytic and cultural feminist theories positing sex differences have been criticized for ignoring variations in gender identity among members of the same sex and even within the same person over time (Deaux & Stewart, 2001). For example, Deaux and Stewart (2001) drew upon McGann's (1995, 1999, as cited in Deaux & Stewart, 2001) work when discussing female "tomboys" who do not conform to the traditional feminine identity, and who may or may not express these "tomboy" traits at different periods of their lives. It follows then that gender identity (i.e., masculine and feminine personalities) may be a better predictor of behaviour than sex (Unger, 1979).

Second, cultural and psychoanalytic feminist theories of sex differences in behaviour based on men's and women's stable masculine and feminine personalities have been criticized for ignoring variability in behaviour based on the influence of context and

situational factors (Deaux & Major, 1990). Deaux and Major (1990) specified a social-psychological model of gender in which behaviour is determined by an interaction among three factors:

The actual behavior of women and men in a situation depends on the relative weight of the three elements: the self-definitions and goals of each participant, the beliefs and expectations of the other, and the context in which the interaction takes place. By this analysis, sex differences, that is, observed differences in the actions of women and men, are one of several possible outcomes. In most cases this outcome could be altered relatively easily if one or more elements were changed. (p. 97)

In particular, power differentials between the sexes have been cited as the real cause of observed sex differences in behaviour (Yoder & Kahn, 1992). For example, in her seminal book, *Body politics: Power, sex, and nonverbal communication*, Henley (1977) argued that sex differences in nonverbal communication paralleled those differences between individuals in dominant and subordinate positions (e.g., men/superiors are less emotionally expressive than women/subordinates). Further writing on this “oppression hypothesis” or “subordination hypothesis” discussed observed sex differences in nonverbal sensitivity (i.e., the ability to decode others’ nonverbal behaviour) as explained by power differences: “it falls to persons of lower power to be able to read the cues of someone possessing higher power, because their ability to respond appropriately, if not their very survival, may depend upon it” (LaFrance & Henley, 1994, p. 291). LaFrance and Henley (1994) cited supportive experimental research demonstrating that situational power, not sex, determined this ability (e.g., Snodgrass, 1985).

It is important to note that relational-cultural theory cites differential socialization practices between the sexes as the source of sex differences (Miller, 1991a), which implies that an internalized gender identity is involved rather than biology.¹ Further, RCT suggests that the power differential between men and women shapes these socialization practices producing sex differences in the importance of relationships to development (Miller, 1986). However, it is ultimately the stability of differences between men and women hypothesized by RCT that is critiqued, and this stability is implicit in theories of sex differences, regardless of whether biology or socialization is cited as the cause of the differences (Deaux & Major, 1990). Thus, critiques of feminist perspectives emphasizing sex differences highlight the potential importance of considering variations in gender identity and situational power in research following from these perspectives.

Summary

Recent developments in mentoring theory have conceptualized mentoring as a quality of developmental relationships in academia (e.g., advising, supervising relationships) rather than a type of relationship (Johnson, 2014). Further, the concept of relational mentoring was also identified as mentoring characterized by mutual learning, growth, empathy and vulnerability, and a holistic approach that recognizes both the personal and professional impacts of mentoring (Johnson, 2014; Ragins, 2012). The concept of relational mentoring was derived from relational-cultural theory, which

¹ Even though *gender* (i.e., “nonphysiological components of sex that are culturally regarded as appropriate to males or to females;” Unger, 1979, p. 1086) is implicated in relational-cultural theory, *sex* is the term used throughout this thesis when referring to the differences between men and women proposed by relational-cultural theory (e.g., Jordan et al., 1991). This is because research informed by the theory has used biological sex as an indicator of the masculine and feminine personalities discussed in the theory, rather than measuring masculine and feminine personalities (e.g., Frey et al., 2004, 2006). Further, the

identified growth-fostering relationships (characterized by mutual authenticity, engagement, and empowerment) as predictors of positive psychological health and development (e.g., Jordan, 2008; Jordan et al., 1991). Relational-cultural theory further hypothesized that women have been socialized to define themselves more in terms of their relationships, which makes them more likely to be impacted by the quality of their relationships (in terms of psychological health) and more likely to cultivate these growth-fostering relationships (e.g., Jordan et al., 1991). Other feminist theories have made similar predictions about feminine and masculine personalities (e.g., Chodorow, 1978; Gilligan, 1982), and these theories have been criticized for ignoring variations in gender identity within each sex (and even within each individual over time), and ignoring the influence of situational factors (including power differentials) on behaviour (Deaux & Major, 1990; Deaux & Stewart, 2001; LaFrance & Henley, 1994; Unger, 1979; Yoder & Kahn, 1992). The next section of this chapter introduces limited research that has begun to explore the concept of relational mentoring and examine the sex differences predicted by relational-cultural theory. This research is discussed in relation to the broader mentoring and feminist psychological research literatures. Importantly, this discussion notes that the extant research has failed to address the theoretical critiques specified thus far.

Research Background

Faculty-Graduate Student Mentoring Research

In over thirty years of mentoring research, the majority of the focus has been on workplace mentoring, making research on faculty-student mentoring rather under-

current research seeks to generally disentangle sex and gender identity as predictors of behaviour, and this use of language helps to clarify this distinction.

developed (Johnson et al., 2007). Because of the conceptual distinction made between academic advising and mentoring (e.g., Johnson et al., 2007; Schlosser et al., 2011), some have examined the prevalence rates of the less common mentoring relationships (e.g., Clark, Harden, & Johnson, 2000). Current estimates suggest that between 50 and 66% of graduate students are mentored (Schlosser et al., 2011). The overall prevalence of mentoring does not appear to differ on the basis of student sex (Clark et al., 2000; Lyons, Scroggins, & Rule, 1990). Interestingly, research examining the prevalence of specific mentoring functions has sometimes found mentor sex differences, although not consistently. For example, Tenenbaum, Crosby and Gliner (2001) found that women mentors provided significantly more psychosocial support to their male and female student protégés. In contrast, Harden et al. (2009) found that both male and female mentors provided more overall support to female students, and male mentors provided more psychosocial support in particular to female students than male students. Other research has failed to demonstrate any differences in the provision of mentoring support on the basis of either mentor or student sex (Ülkü-Steiner, Kurtz-Costes, & Kinlaw, 2000; Wilde and Schau, 1991). Meta-analytic research in workplace mentoring has found that male mentors provided more career functions and female mentors provided more psychosocial functions, although effect sizes appeared to be small and varied (O'Brien, Biga, Kessler, & Allen, 2010).

Not surprisingly, research has also been devoted to identifying the outcomes of mentoring relationships. Johnson et al. (2007) identified several methodological limitations of this research, including a lack of conceptual clarity (e.g., assuming advisors were mentors), a lack of standard measures for mentoring functions, low response rates,

unsophisticated designs (e.g., retrospective surveys), and biased samples (e.g., looking at successful graduates and/or overrepresentation of students with wholly positive mentoring relationships). Nonetheless, research has linked faculty-student mentoring to student outcomes such as increased research productivity, skill development, and research self-efficacy (see Johnson, 2007, for a review). Some research has specifically examined the effects of each of Kram's (1983) mentoring functions; this research indicates career and psychosocial mentoring functions are associated with distinct outcomes (Forehand, 2008). For example, Tenenbaum et al., (2001) surveyed 189 graduate students from both science and social science departments at the University of California about the functioning of their mentoring relationships with their advisors and multiple outcomes. Their cross-sectional data yielded significant associations between instrumental help and networking help (which are essentially career functions of the relationship) and student productivity (e.g., conference presentations, published work). Psychosocial functions were associated with satisfaction with the mentor and school experience. More recently, Lunsford (2012) surveyed 477 doctoral students from multiple disciplines at two American universities and found a significant correlation between career mentoring functions provided by advisors and students' academic productivity (i.e., number of publications and conference presentations, progress in the student's degree), and a significant correlation between psychosocial functions and satisfaction with the advisor.

Relational mentoring research. Research on relational mentoring (Johnson, 2014; Liang et al., 2002a; Ragins, 2012) is particularly scarce. A recent qualitative study of master's students and professors in "a meaningful academic relationship" found

support for relational-cultural theory's concept of mutual growth in connection (Schwartz & Holloway, 2012). No quantitative research has been completed on relational mentoring with graduate students. To date, only three studies² have quantitatively examined the effects of relational mentoring on undergraduate students (i.e., Frey et al., 2004, 2006; Liang et al., 2002a). The implication of this construct being born from relational-cultural theory (e.g., Jordan et al., 1991) is that this research has been grounded in this feminist theory and its assumptions. This is evident in the measure of relational mentoring used, the outcomes examined, the students sampled, and the analyses performed. First, all three studies used the Relational Health Indices – Mentor scale (RHI-M; Liang et al., 2002b), which is directly informed by relational-cultural theory. Second, all three studies examined psychological health outcomes (i.e., loneliness, self-esteem, psychological distress). Relational-cultural theory posited that growth-fostering relationships characterized by mutual authenticity, engagement, and empowerment are associated with positive psychological health (e.g., Jordan et al., 1991). The third and fourth indications that this research has been grounded in relational-cultural theory can be discussed together because both relate to sex differences hypothesized in relational-cultural theory. In particular, recall that relational-cultural theory suggested women develop more relational selves than men, which increases the impact of relationship quality on women's psychological health in particular (e.g., Miller, 1991a). Thus, Liang et al. (2002a) studied the effects of relational mentoring on the psychological health of an exclusively female sample of undergraduate students, and Frey et al. (2004, 2006)

² A study by Liang, Tracy, Taylor, Williams, Jordan, and Miller (2002b) is not included in this count as it appears there may be overlap in the sample data used between this study and that of Liang, Tracy, Taylor, and Williams (2002a).

examined sex differences in the effects of relational mentoring on the psychological health of a sample of undergraduate students.

The results from these three studies were mixed. Liang et al. (2002a) found a significant correlation between relational mentoring and students' increased self-esteem and decreased loneliness, even after controlling for covariates, including structural aspects of the relationship such as the length of the relationship and frequency of contact. However, Frey et al. (2004, 2006) failed to find a significant correlation between relational mentoring and student psychological health in either male or female students. Frey et al. (2006) interpreted these findings as possibly indicating that mentoring experiences may be unusual for undergraduate students and/or may have a greater impact on academic as opposed to psychological health outcomes but recommended further research. It is also important to note that Liang et al. (2002a) sampled undergraduate students who identified themselves as being mentored by faculty or non-faculty contacts, while Frey et al. (2004, 2006) did not provide information on how their mentoring relationships were defined or who was involved.

Relational mentoring has not been examined within the context of faculty-graduate student mentoring relationships. Further, the three studies with undergraduate students described here failed to consider theoretical critiques of relational-cultural theory. Specifically, variations in gender identity and situational power should be considered in research grounded in theories of sex differences (e.g., Unger, 1979; Yoder & Kahn, 1992). Research is also needed to test relational-cultural theory's suggestion that women are more likely to cultivate growth-fostering relationships characterized by mutual authenticity, engagement, and empowerment (e.g., Jordan et al., 1991) within the

context of mentoring. Limited research has hinted at potential sex differences in the relationship style of academic mentors with reports of female-female academic role modeling relationships involving more personal dimensions (e.g., selecting mentors based on personal attributes, lifestyle and values) than male-male relationships (Gilbert & Evans, 1985). Heinrich's (1995) qualitative research with female doctoral graduates with female advisors also identified interpersonal warmth and empowerment as key to these same-sex mentorships but their results also indicated that not all of these relationships were positive (or had these key characteristics) and sex differences could not be examined. It may be argued that research on mentor sex differences regarding the provision of psychosocial mentoring functions may be relevant to a discussion of potential sex differences in relational mentoring given functions such as providing friendship, acceptance and confirmation (Kram, 1983) more closely resemble the elements of relational mentoring discussed (e.g., being authentic, engaged, and empowering; Liang et al., 2002a) than examples of career functions, such as providing visibility and networking opportunities (Kram, 1983). However, as discussed above, this research has produced mixed results. Feminist psychological research has begun to examine the core assumptions of relational-cultural theory in the context of other relationships and can provide a foundation for this research in mentoring.

Relational-Cultural Theory Research

Feminist psychological research began with the women's movement of the 1960s (see Crawford & Unger, 2004, for an excellent review). Much of this research has contributed to a debate within feminism regarding whether gender differences or similarities should be emphasized. Feminists within the "similarities tradition"

emphasize similarities between women and men to advocate equality, while feminists within the “differences tradition” emphasize women’s unique caring and relational selves to advocate social change that values these qualities (see Kimball, 1994, for a thorough review). Relational-cultural theory (RCT; e.g., Jordan, 2008; Jordan et al., 1991) and research informed by RCT clearly falls within the “differences tradition.” Given relational-cultural theory’s focus on women’s development (e.g., Jordan et al., 1991), much of RCT research on the importance of relationships to psychological health has been completed with women-only samples. This research has generally supported a correlation between greater relational qualities in relationships (i.e., mutual authenticity, engagement, empowerment) and better psychological health but has relied heavily on cross-sectional designs with mostly undergraduate university students. Nevertheless, the relational dimensions of relationships with partners, parents, and peers have been linked to outcomes in expected directions, including eating disorder symptoms, depression, self-esteem, and loneliness (Kayser, Sormanti, & Strainchamps, 1999; Liang et al., 2002b; Sanftner et al., 2006; Sperberg & Stabb, 1998; Tantillo & Sanftner, 2003; Wechsler, Riggs, Stabb, & Marshall, 2006).

Research on sex differences in the importance of relational qualities to psychological health has produced mixed results. Some has supported relational-cultural theory and demonstrated statistically significant correlations between the relational qualities of mutual authenticity, engagement and empowerment in relationships and positive psychological outcomes for women but not men in dyadic relationships³ with peers or partners (Frey et al., 2004, 2006; Genero, Miller, Surrey, & Baldwin, 1992). In

³ Recall that some have theorized the importance of intimate dyads to women and the importance of larger groups to men (e.g., Bergman, 1995).

contrast, others failed to find sex differences in the correlation between a mutual relationship with one's partner (i.e., balancing autonomy and connection in decision-making, need prioritization, sensitivity to feelings, boundaries, and preoccupation with the relationship) and positive psychological health (e.g., increased self-worth, decreased depression; Neff, Brabeck & Kearney, 2006; Neff & Harter, 2002). It is important to note that inconsistencies in measurement between studies make comparisons difficult. Importantly, tests of the moderating effects of gender identity (i.e., masculine and feminine traits) or power dynamics – in other words, variables recommended in research on sex differences (e.g., Unger, 1979; Yoder & Kahn 1992) – on the correlation between relational qualities and psychological health outcomes are absent from this literature.

Some research relevant to relational-cultural theory's prediction that men and women have different relationship styles has, however, examined gender identity or power (but not both together). Three areas of research are relevant to the hypothesis that women have more relational, feminine personalities and thus, are more likely to adopt a relationship style needed to develop growth-fostering relationships (i.e., mutual authenticity, empowerment, and engagement; e.g., Miller, 1991, 2008). First, research has examined sex differences in self-concepts and the incorporation of relationships in those self-concepts. Research appears to support sex differences, with women showing more interdependent self-construals than men, particularly with regards to close, intimate dyads (e.g., Cross & Madson, 1997; Gabriel & Gardner, 1999). Second, research has examined sex differences in average scores on scales of femininity and masculinity. This research has demonstrated both sex differences and changes in the characteristics associated with each sex over time. For example, between 1973 and 1994, women

increasingly identified with more masculine traits over time, but they were still more likely to identify with feminine traits than males, whose femininity scores remained largely unchanged (Twenge, 1997). The increases to women's endorsement of stereotypically masculine characteristics support critics of theories of stable sex differences, like RCT, but persistent sex differences in femininity items may arguably support RCT in its hypothesis that women have a distinct feminine personality. In either case, such research highlights the importance of examining gender identity in research on sex differences, as recommended by Unger (1979).

The most critical area of research is a third area that has examined sex differences in relationship styles directly; this research has produced mixed results. For example, Genero et al. (1992) found that friendships between women had the highest levels of mutual authenticity, engagement, and empowerment while friendships between men had the lowest mutual authenticity, engagement, and empowerment. In contrast, several studies completed by Neff et al. have cast doubt on the stability of sex differences in relationship styles. This research has found the presence of sex differences in relationship style to depend on cultural context (i.e., finding sex differences in a sample of Mexican Americans but not European Americans; Neff, Brabeck, & Kearney, 2006). Further, their research has indicated both women's and men's relationship styles vary across different relationship domains, including relationships with mothers, fathers, friends, and partners (Neff & Harter, 2003), and that the power dynamics of the relationship in particular predict relationship style rather than sex, with dominance associated with greater autonomy, subordination associated with greater connection, and equality associated with a balancing of autonomy and connection (Neff & Harter, 2002,

2003). However, their use of a relatively coarse instrument may have limited variability in their data, and thus, the statistical power of their analyses. Nevertheless these results suggest the importance of considering context, and power dynamics in particular, when examining sex differences in relationship style.

Current Research

The current research was designed to address critical gaps in the mentoring and feminist psychological literatures. First, research with undergraduate students has demonstrated a correlation between relational mentoring and positive student psychological health (Liang et al., 2002a), but this correlation has not been tested within the context of faculty-graduate student mentoring. Second, given the concept of relational mentoring is derived from relational-cultural theory, research on relational mentoring should test key assumptions of this feminist theory regarding sex differences in relationships (e.g., Jordan et al., 1991). In particular, two questions need to be addressed within the context of faculty-graduate student mentoring relationships: 1) is relational mentoring more important to the psychological health outcomes of women; and 2) are women more likely to adopt a relationship style that would foster relational mentoring? Limited research on undergraduate students has provided mixed results regarding the first question (Frey et al., 2004, 2006; Liang et al., 2002a), but this question needs to be addressed within faculty-graduate student mentoring relationships. No mentoring research has directly examined the second question, and research related to this issue (i.e., sex differences in feminine traits and relationship styles) in other relationship domains has overall produced mixed findings.

Finally and importantly, research on relational mentoring that tests these sex differences posited by relational-cultural theory should consider critiques of the “differences tradition” by including variables representing gender identity (i.e., feminine, masculine personalities) and situational power (e.g., Unger, 1979; Yoder & Kahn, 1992). Quantitative research on faculty-graduate student relational mentoring is absent from the literature, and limited research on undergraduate student relational mentoring has failed to consider gender identity or power (Frey et al., 2004, 2006; Liang et al., 2002a). Some feminist psychological research has examined sex differences in gender identity (e.g., Twenge, 1997) and some research has examined the influence of sex versus power on relationship styles (Neff & Harter, 2002, 2003), but research is absent from the literature that examines sex, gender identity, and power simultaneously as moderators of the correlation between the relational dimensions of a relationship and psychological health outcomes, or examines sex, gender identity, and power simultaneously as predictors of relationship styles.

Therefore, the next two chapters present two unique studies grounded in both mentoring and feminist psychological theory to address two important research questions: 1) is faculty-graduate student relational mentoring correlated with positive psychological health outcomes for students, and is this correlation moderated by student sex, student gender identity, and/or the particular power dynamics of the relationship; and 2) does sex, gender identity, and/or situational power predict whether an individual adopts a relationship style associated with relational mentoring (i.e., mutually authentic, engaged, empowering)? Chapter 2 presents a study with a cross-sectional survey design examining the first research question in a sample of graduate students from universities across

Canada. Chapter 3 presents an experiment addressing the second research question with a sample of undergraduate participants completing courses in Carleton University's Department of Psychology. Finally, Chapter 4 provides a general discussion of the results of these two studies in relation to the broader theory and research literature presented in this first chapter.

Chapter 2: Study 1

Do Sex, Gender Identity, and Power Moderate the Association between Faculty-Graduate Student Relational Mentoring and Student Psychological Health?

Limited research has demonstrated an association between relational mentoring characterized by mutual authenticity, engagement, and empowerment, and positive psychological health in female undergraduate students (Liang et al., 2002a). However, research is needed to explore this correlation within the context of faculty-student mentoring with male and female graduate students. Further, research is needed to test the theory that relational mentoring is more important to women's psychological health than men's (e.g., Jordan et al., 1991). Such research should also be informed by critiques of this cultural feminist theory, which have not been adequately incorporated in previous mentoring and feminist psychological research. The current study was designed to address these gaps in the literature. In particular, this study examined relational mentoring between graduate students and their faculty thesis advisors. In addition, the significance of the effects of several moderators on this association was directly tested. This study examined the moderating effect of sex based on cultural feminism, particularly relational-cultural theory (e.g., Jordan et al., 1991), and the moderating effect of gender identity (masculine/feminine traits) and power dynamics based on the critiques of cultural feminist perspectives (e.g., Deaux & Stewart, 2001; LaFrance & Henley, 1994; Unger, 1979; Yoder & Kahn, 1992). More specifically, this research was completed to test the following four hypotheses:

Hypothesis 1: Relational mentoring characterized by mutual authenticity, engagement and empowerment between graduate students and their faculty thesis advisors will be significantly correlated with better student psychological health (i.e., decreased depressive symptoms, and increased self-esteem and life satisfaction).

Hypothesis 2: The correlation between faculty-graduate student relational mentoring and student psychological health will be significantly moderated by sex with stronger effects emerging for women.

Hypothesis 3: The correlation between faculty-graduate student relational mentoring and student psychological health will be significantly moderated by gender identity with stronger effects emerging for those identifying with more feminine traits.

Hypothesis 4: The correlation between faculty-graduate student relational mentoring and student psychological health will be significantly moderated by power dynamics in the relationship with stronger effects emerging for those reporting lower power than other students in relation to their advisors (in other words, for those students reporting their faculty mentors have higher power over them).

Method

Participants

Participants were recruited from four professional, scholarly organizations with student memberships (two social science, two science/engineering) and twelve Canadian universities with graduate student populations. The recruitment procedures are described

in detail below. Overall, 469 graduate students in the process of completing a thesis under the supervision of a faculty member at a Canadian university participated in the study. Importantly, the recruitment notice specified mentoring relationships were the subject of the survey (see Appendix A).

Although the initial dataset was comprised of 469 participants, 48 cases were missing over 50% of the data. Consequently, these cases were eliminated, resulting in a final sample size of 421 participants. The final remaining sample was compared to the eliminated cases and no substantial differences emerged in terms of sex, ethnicity, degree (i.e., Master's versus Doctorate), faculty, or age (see Appendix B for detailed statistical results). Further, few extreme values were identified in the eliminated sample in terms of study variables they did report (i.e., only five reported knowing their mentor for relatively short periods of time, and one reported having extremely high funding). Thus, it is unlikely that eliminating these 48 cases introduced a systematic bias into the study.

Thus, the final sample included 133 (31.6%) men and 283 (67.2%) women. Five participants (1.2%) did not indicate their sex. Participants identified themselves as Caucasian (73.2%; $n = 308$), Arab/West Asian (4%; $n = 17$), Chinese (3.3%; $n = 14$), Latin American (2.9%; $n = 12$), South Asian (1.7%; $n = 7$), of mixed ancestry (3.1%; $n = 13$), other ancestry (11.6%; $n = 49$), or unknown ancestry (0.2%; $n = 1$). Participants' reported ages ranged from 21 to 67 years ($M = 29.48$; $SD = 6.62$). Seven participants (1.7%) did not indicate their age. Participants were completing Doctorates (57.5%; $n = 242$) and Master's (42.3%; $n = 178$) degrees in the following fields: arts and social sciences (44.7%; $n = 188$), science (28.5%; $n = 120$), engineering and design (15.7%; $n =$

66), public affairs (9%; $n = 38$), and business (1.2%; $n = 5$). One participant (0.2%) did not indicate their degree and four participants (1.0%) did not indicate their discipline.

Materials

Demographics. Participants provided the following demographic information: sex, age, ethnicity, degree (i.e., Master's or Doctorate), and academic discipline (see Appendix C).

Mentoring covariates. Based on the literature (i.e., Liang et al., 2002a; Peluso et al., 2011), the following covariates were included: mentor/student similarity, duration of mentoring relationship, degree of contact, funding amount, and satisfaction level with the mentoring relationship (see Appendix C). Two indices of similarity to one's mentor were used: similarity on the basis of sex and ethnicity, and perceived overall similarity. The former was assessed on a three-point scale with 0 indicating the mentor had a different sex and ethnicity from the student, 1 indicating the mentor had either the same sex or ethnicity, and 2 indicating the mentor had the same sex and ethnicity as the student. Perceived overall similarity was measured on a scale from 1 ("not at all similar") to 5 ("completely similar"). Mentoring relationship duration was assessed on a four-point scale with 1 indicating a relationship of less than 6 months, 2 indicating a relationship of 6 months to less than 1 year, 3 indicating a relationship between 1 and 2 years, and 4 indicating a relationship of at least 2 years. Degree of contact was measured by averaging across two items: how often they had individual meetings with their mentor, and how often they had contact with their mentor via e-mail or phone. Both items were measured on a scale from 1 to 4 (1 = less than once a month, 2 = once or twice a month, 3 = three or four times a month, 4 = more than once a week). Participants provided their

level of funding through academic sources (e.g., scholarships, research and teaching assistantships) for their current academic year. Overall satisfaction with the mentoring relationship was measured on a scale from 1 or “not at all satisfied” to 5 or “completely satisfied.”

Relational mentoring. Consistent with Liang et al. (2002a), relational mentoring was measured using the Relational Health Indices (RHI; Liang et al., 2002b). The RHI are directly informed by relational-cultural theory (e.g., Jordan et al., 1991) and capture the elements of mutual authenticity, engagement and empowerment. The RHI assess relationship quality in three domains: relationships with peers, mentors, and communities. However, only the RHI-Mentor (RHI-M) subscale was used in the study. The RHI-M includes 11 items with each item scored on a five-point Likert scale from 1 (“never”) to 5 (“always”). Sample items include “I believe my mentor values me as a whole person (e.g., professionally/ academically and personally),” “My mentor shares stories about his/her own experiences with me in a way that enhances my life,” “My mentor gives me emotional support and encouragement,” and “I feel comfortable expressing my deepest concerns to my mentor” (see Appendix D for full measure). An average RHI-M score was calculated; thus, scores could vary between 1 and 5, with higher mean scores indicating greater mutual authenticity, empowerment and engagement. The RHI-M has shown high internal consistency in past research (e.g., $\alpha=.85$, Liang et al., 2002a) and in the current study ($\alpha=.95$). Research has also illustrated that the RHI-M evidences strong convergent validity ($r = .51 - .68$ with other validated measures of relationship quality; Liang et al., 2002b), and adequate concurrent validity ($\beta = .14$ with self-esteem, $\beta = -.15$ with loneliness, Liang et al., 2002a). Further, factor

analyses have strongly supported the RHI-M's construct validity by confirming the presence of three factors: authenticity, engagement, and empowerment (factor loadings = .52 - .76; Goodness-of-Fit Index = .89; Comparative Fit Index = .91; Liang et al., 2002b).

Gender identity. Participants completed the Masculinity and Femininity subscales of the Personal Attributes Questionnaire (PAQ-M and PAQ-F; Spence & Helmreich, 1978). Each subscale had 8 items scored from 0 ("not at all like me") to 4 ("very much like me"); total scores could range from 0 to 32 with higher scores indicating higher identification with masculine and feminine traits, respectively. Sample items include "independent" for masculine, and "warm" for feminine (please see Appendix E for full measure used). Only femininity scores were used in the analyses given that relational-cultural theory posits that relationships are central to psychological health among women who are socialized to be feminine (Jordan et al., 1991).⁴ The femininity subscale has demonstrated adequate internal consistency in previous research (e.g., $\alpha = .75$, Burnett, Anderson, & Heppner, 1995; $\alpha = .72$ to $.80$ across six samples, Helmreich, Spence, & Wilhelm, 1981) and in the current sample as well ($\alpha = 0.79$). Factor analyses with the PAQ-M and PAQ-F subscales have supported the PAQ's construct validity by confirming the presence of two factors: masculinity and femininity (average factor loading = .53 for femininity items loading on the femininity factor across six samples; Helmreich et al., 1981). The strong convergent validity of the femininity scale has been demonstrated in multiple studies with correlations between PAQ-F scores and another popular measure of femininity (i.e., the femininity subscale of the Bem Sex

⁴ Masculinity total score was later assessed as a moderator in the planned regressions to see if the decision to focus on femininity total score impacted the results. However, the results with respect to moderation were consistent with those using femininity total score as a moderator.

Role Inventory; Bem, 1974) ranging from .52 to .71 (see Spence, 1991, for a review).

Women have also scored significantly higher than males on the PAQ-Femininity scale in previous research (e.g., English-speaking male versus female university administrators, $t(635) = 2.05, p = .02$, 1-tailed, Hill, Fekken, & Bond, 2000; female college student $M = 24.37, SD = 3.68$, male college student $M = 22.43, SD = 3.73, p < .01$, Spence & Helmreich, 1978), and in the current study (female $M = 24.33, SD = 4.41$, male $M = 22.38, SD = 5.31, t(217.55) = -3.64, p < .001$, 2-tailed).

Power. The power dynamics of the mentoring relationship were measured using a minimally modified version of the Interpersonal Power Inventory (IPI; Raven, Schwarzwald & Koslowsky, 1998). The IPI measures social power defined as “the resources one person has available so that he or she can influence another person to do what that person would not have done otherwise” (Raven et al., 1998, p. 307). The original IPI measures eleven different subtypes of social power in a supervisory relationship in the workplace. Participants are instructed to think of a situation when they complied with a request from their supervisor, despite initial reluctance to do so, and indicate the likelihood that each type of power contributed to their reason for compliance from 1 (“definitely not a reason”) to 7 (“definitely a reason”). These types of power include impersonal reward power (e.g., “A good evaluation from my supervisor could lead to an increase in pay”), impersonal coercive power (e.g., “My supervisor could make things unpleasant for me”), personal reward power (e.g., “My supervisor made me feel more valued when I did as requested”), and personal coercive power (e.g., “Just knowing that I was on the bad side of my supervisor would have upset me”). Social power bases also include referent power (e.g., “I looked up to my supervisor and generally modeled

my work accordingly”), expert power (e.g., “My supervisor probably knew the best way to do the job”), and informational power (e.g., “Once it was pointed out, I could see why the change was necessary”). Power derived from perceived legitimacy includes legitimate position power (e.g., “My supervisor had the right to request that I do my work in a particular way”), legitimate reciprocity (e.g., “For past considerations I had received, I felt obliged to comply”), legitimate equity (e.g., “Complying helped make up for things I had not done so well previously”), and legitimate dependence (e.g., “Unless I did so, his/her job would be more difficult”).

These subtypes of social power have been divided into two general categories: harsh and soft power. Erchul, Raven, and Ray (2001) described the distinction between harsh and soft power in the following way: “soft or weak bases tend to be more subtle, positive, and noncoercive, but harsh or strong bases tend to be more overt, punitive, and ‘heavy-handed’” (p. 6). Harsh power bases include impersonal coercive power, personal coercive power, impersonal reward power, personal reward power, legitimate reciprocity and legitimate equity. In contrast, soft power bases include expert power, referent power, informational power, legitimate dependence, and legitimate position (Raven et al., 1998; Elias & Mace, 2005; Wilson, Erchul, & Raven, 2008).

Minimal modification of the wording of instructions and items in the IPI was required to suit the context of the mentoring relationship between thesis advisors and graduate students. In particular, the instructions were modified slightly so that the word “subordinate” was replaced with “student,” “supervisor” was replaced with the term “thesis supervisor” and references to a “job” were replaced with the more general term “work.” The same replacement of terms was used in the individual items when needed.

In addition, references to the supervisor's influence on pay in two items were altered to refer to the thesis supervisor's influence on funding, and references to the supervisor's influence on promotions in two items were altered to refer to the thesis supervisor's influence on progress in the student's degree and/or career (see Appendix F for full measure). Similar modifications have been required when applying the IPI to other educational settings and research questions (Elias & Loomis, 2004). In their research on instructor power, Elias and Loomis (2004) calculated harsh and soft power averages using the items loading on these two factors in previous research (e.g., Elias & Mace, 2005; Raven et al., 1998; Wilson et al., 2008). The same procedure was used in the current study to calculate harsh and soft power averages. Thus, two scores were calculated (i.e., harsh and soft power) which could range from 1 to 7, with higher scores indicating the mentor had higher power (and the student had relatively lower power).

Multiple factor analyses have divided the eleven bases of social power into harsh and soft power (e.g., Elias & Mace, 2005; Raven et al., 1998; Wilson et al., 2008). The internal consistency of the harsh and soft power bases has been demonstrated in multiple studies, including studies that have modified the wording of the instructions and items to suit the hierarchical relationship between instructors and students in the classroom (e.g., harsh $\alpha = .85$, soft $\alpha = .85$, Elias & Loomis, 2004; harsh $\alpha = .81$, soft $\alpha = .71$, Elias & Mace, 2005). Similarly, the minor modifications applied to the IPI in the current study did not alter the internal consistency of the harsh and soft power scores ($\alpha = .88$ and $.73$, respectively). Previous research has also demonstrated the IPI's moderate to strong concurrent validity (partial r 's with employee self-esteem = $-.40$ and $.22$ for supervisor harsh and soft power, respectively, Pierro, Cicero, & Raven, 2008).

Psychological health. Self-esteem and depression were selected as psychological health outcomes based on previous use in the literature (i.e., Liang et al., 2002a; Peluso et al., 2011). Life satisfaction was also selected to determine the extent to which the relational dimension of mentoring affect additional global outcomes (outside of academia). Thus, three outcome measures were included: the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), the Rosenberg Self-Esteem scale (RSES; Rosenberg, 1965), and the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996).

The Satisfaction With Life Scale (Diener et al., 1985) is a five-item scale measuring one's personal satisfaction with the general state of one's life. Each item is rated on a Likert scale from 1 ("strongly disagree") to 7 ("strongly agree"). Scores range from 5 to 35 with higher summed scores indicating greater global satisfaction with life. Sample items include "In most ways my life is close to my ideal," and "The conditions of my life are excellent" (see Appendix G for full measure). Factor analyses have supported the construct validity of the SWLS, indicating all items loaded on a single factor (loadings = .61 - .84, Diener et al., 1985). The scale has demonstrated high internal reliability in past research ($\alpha = .88$, Chang & Sanna, 2001; $\alpha = .87$, Diener et al., 1985) and in the current study ($\alpha = .88$). Additional research has also demonstrated the SWLS' strong convergent validity (mean $r = .44$ with self-esteem for men across 31 cross-cultural samples, mean $r = .45$ with self-esteem for women across 31 cross-cultural samples, Diener & Diener, 1995), and strong criterion validity ($r = .41$ with positive affect, $r = -.44$ with negative affect, $r = -.50$ with depression, Chang & Sanna, 2001; $r = .50$ and $.51$ with positive affect, $r = -.37$ and $-.32$ with negative affect across two samples,

Diener et al., 1985; $r = .37$ with duration of positive affect over 40 to 70 days of self-reports, Larsen, Diener, & Emmons, 1985).

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) is a 10-item self-report scale measuring general feelings about oneself. Items are rated on a four-point scale from 1 (“strongly disagree”) to 4 (“strongly agree”). Item responses were totaled following the reverse-scoring of negatively-worded items; scale totals can range from 10 to 40 with higher total scores indicating higher self-esteem. Sample items include “On the whole, I am satisfied with myself,” and “I take a positive attitude toward myself” (see Appendix H for full measure). Multiple factor analyses have found RSES items to load on a single factor (factor loadings = .35 to .73 in a Canadian sample, Schmitt & Allik, 2005; Goodness-of-Fit = 45.98, Shevlin, Bunting, & Lewis, 1995; factor loadings = .66 to .85, Sinclair et al., 2010), and the RSES has demonstrated high internal reliability in previous research ($\alpha = .88$, Greenberger, Chen, Dmitrieva, & Farruggia, 2003; mean $\alpha = .81$ across samples in 53 countries, Schmitt & Allik, 2005; $\alpha = .91$, Sinclair et al., 2010), and in the current study ($\alpha = .90$). Further, the scale has demonstrated strong convergent ($r = .55$ and $.66$ with another self-esteem inventory in two overlapping samples of adolescents at two time points, Demo, 1985; r 's = $.37$, $.37$ and $.40$ with positive models of self in romantic attachments in mostly college student samples from Canada, the United Kingdom and United States, respectively, Schmitt & Allik, 2005) and criterion validity (r 's = $-.62$, $-.47$, and $-.52$ with depression, anxiety, and stress, respectively, Sinclair et al., 2010; r 's = $-.36$ and $-.22$ with dieting and binge eating, respectively, Stice, Presnell, & Spangler, 2002).

Finally, the Beck Depression Inventory-II (Beck et al., 1996) is a self-report measure of depressive symptoms with 21 items. Each symptom is rated from 0 to 3 based on presence and severity. Total scores could range from 0 to 63, with higher scores indicating more severe depressive symptoms. Sample symptoms include sadness, pessimism, and loss of pleasure. Factor analyses have found items to load on two factors representing cognitive-affective symptoms and somatic symptoms in samples of college students (Beck et al., 1996; Dozois, Dobson, & Ahnberg, 1998; Storch, Roberti, & Roth, 2004). The BDI-II has shown high internal consistency in previous research ($\alpha = .92$ and $.93$ for samples of psychiatric outpatients and college students, respectively, Beck et al., 1996; $\alpha = .90$, Leonard, Steer, Rissmiller, & Beck, 2009; $\alpha = .90$, Storch et al., 2004) and in the current study ($\alpha = .93$). Additional research has also demonstrated the scale's strong convergent validity (r 's = $.68$, $.37$, and $.71$ with hopelessness, suicide ideation, and another measure of depression, respectively, Beck et al., 1996) and criterion validity (outpatient $M = 22.45$, $SD = 12.75$, college student $M = 12.56$, $SD = 9.93$, $t(618) = 7.94$, $p < .001$, Beck et al., 1996; college students receiving counselling with active depressed mood diagnosis $M = 27.53$, $SD = 9.79$, college students receiving counselling without active depressed mood diagnosis $M = 10.50$, $SD = 7.65$, $t(135) = 10.58$, $p < .01$, Sprinkle et al., 2002).

Procedures

After obtaining clearance from the Psychology Research Ethics Board (REB) at Carleton University, two recruitment procedures were followed. First, professional organizations in social science, science, and engineering were contacted with information about the study, asking them to forward the recruitment notice to their student members

(see Appendix A). In one case initial contact occurred using the organization's formal review process facilitated by the organization's online portal for research participant recruitment. In all other cases, initial contact occurred via e-mail. Eight organizations were contacted and four (two social science, two science/engineering) agreed to facilitate recruitment. One organization posted the recruitment notice in their monthly newsletter, another posted the recruitment notice using a designated online portal for research participant recruitment, and included the information in its monthly newsletter. Lastly, the remaining two organizations forwarded the recruitment notice via their respective e-mail client systems.

Second, twelve Canadian universities with graduate programs in arts and social sciences, science, and engineering were targeted for recruitment. The sample of universities was selected to include regions from across Canada and include universities of variable size. Nine of the participating universities were from central Canada, one was from western Canada, and two were from eastern Canada. Part-time and full-time graduate student populations ranged from under 1000 to over 6000 graduate students. The first point of contact at each university was the relevant REB to receive approval to proceed (six of the REBs required an additional ethics review of the study), followed by the heads (i.e., Deans or Associate Deans) of thirty-six faculties, representing faculties of arts and social sciences, science, engineering, and graduate studies. Twenty-three faculties agreed to forward the recruitment notice to students either directly or indirectly through department heads; in three cases, a regularly-scheduled graduate student newsletter was sent directly to students rather than a direct or indirect e-mail forward. Further, two faculty heads approved my contacting individual departments directly;

seventeen department heads were contacted and twelve forwarded my recruitment notice to students.

Recruitment notices forwarded to graduate students invited them to participate in an anonymous online survey about their mentoring relationship with their thesis advisor and included a link to the survey (at www.fluidsurveys.com). Participants provided informed consent before the first page of the survey on the website (see Appendix I) and were debriefed through the website following the last question of the survey (with participants scoring high on depression and/or suicidal ideation receiving an enhanced debriefing with more information on depression and treatment; see Appendix J). The anonymous data were downloaded from the survey website and analyzed.

Results

Missing Values and Multiple Imputation

Missing value analysis was completed to assess the amount and pattern of missing data for the fourteen variables (including six covariates, one predictor, four moderators, and three outcomes). Overall, 322 participants (76.5%) had complete data. Sixty-eight participants (16.2%) were missing one variable (7.1%), thirteen participants (3.1%) were missing two variables (14.3%), five participants (1.2%) were missing three variables (21.4%), two participants (0.5%) were missing four variables (28.6%), eight participants (1.9%) were missing five variables (35.7%), two participants (0.5%) were missing six variables (42.9%), and one participant (0.2%) was missing seven variables (50.0%). The amount of missing data at the variable level ranged from 0% for the relationship satisfaction covariate to 11.9% ($n = 50$) for Beck Depression Inventory-II (BDI-II) total scores. Three variables were missing between 5 and 11.9% of the 421 participants (i.e.,

funding, Rosenberg Self-Esteem Scale, BDI-II), and eleven variables were missing less than 5% of participants. Little's Missing Completely at Random (MCAR) test was non-significant ($\chi^2(286) = 324.02, p = .060$), and none of the 36 separate variance *t*-tests were significant (with an adjusted alpha of .001), indicating the data were likely missing completely at random. Nevertheless, multiple imputation was used to replace missing values to preserve the original sample size for all subsequent analyses. In this process, regression was used to estimate missing values based on variables entered as predictors in the model. Random error was added to the predicted scores for the missing values through two steps – first, when a random sample was taken from existing data to identify a variable's distribution, and second, when a random sample was taken from that variable's distribution to provide the final estimate for missing values in each iteration of the multiple imputation (Tabachnick & Fidell, 2007, p. 69). Ten iterations were used given the relatively small amount of missing data (White, Royston & Wood, 2011). Thus, final analyses were completed with pooled estimates based on ten complete datasets.

Prior to completing the multiple imputations, however, the covariates were first examined to eliminate those statistically unrelated to the outcome variables. Therefore, only those variables that would be included in the final regression analyses would be included in the model used in multiple imputation.⁵ Partial correlations were calculated between each of the six covariates and each dependent variable, controlling for the other covariates (see Appendix K). Using an alpha of .05, only one covariate was significantly associated with any of the dependent variables. Relationship satisfaction was

⁵ Including too many variables in the model for multiple imputation can reduce model convergence such that the process cannot be completed.

significantly correlated with all three outcome measures – the Beck Depression Inventory - II, Rosenberg Self-Esteem Scale, and Satisfaction With Life Scale ($r = -0.23, 0.21, \text{ and } 0.23$, respectively, $p < .001$). Thus, only satisfaction was included in the multiple imputation and the subsequent regression analyses. Multiple imputation then proceeded with ten iterations. All descriptive statistics were similar between the original and the ten imputed datasets (see Tables 2.1 and 2.2 in the next section).

Descriptive Statistics

Descriptive statistics were calculated to determine the overall characteristics of the sample and the mentoring relationships sampled in terms of the continuous variables that would be used in subsequent hypothesis-testing. Tables 2.1 and 2.2 indicate participants had a full range of levels of relationship satisfaction, with the average being above the mid-point on the five-point scale. These ratings are similar to ratings of graduate student satisfaction with advisor relationships reported by Peluso et al. (2011; range = 1 - 5; $M = 3.43$; $SD = 1.15$). Similarly, Relational Health Indices – Mentor (RHI-M) scores varied across the full range of possible scores, with the average being above the middle of the possible range of scores. These scores are slightly lower than those reported by Liang et al. (2002a; range = 2.18 – 5.00; $M = 4.06$; $SD = 0.56$). No participants reported the lowest possible Personal Attributes Questionnaire – Femininity (PAQ-F) score and the average score was above the middle of the possible range of scores. As reported in the Method section, male and female responses on the PAQ-F were similar to those reported in previous research (e.g., Spence & Helmreich, 1978). Interpersonal Power Inventory – soft (IPI-soft) scores were higher than Interpersonal Power Inventory – harsh (IPI-harsh) scores. IPI-soft scores were above the middle of the

possible range while IPI-harsh scores were below the middle of the possible range, although scores on both scales varied across almost the full range of possible scores. No data on the harsh and soft power average scores of faculty mentors were available in the literature for comparison.

Table 2.1

Descriptive Statistics of the Distributions of Participant Scores in the Original Dataset

Variable	<i>N</i>	Mean (<i>SD</i>)	Minimum	Maximum
Satisfaction	421	3.81 (1.28)	1.00	5.00
RHI-M	414	3.32 (0.99)	1.00	5.00
PAQ-F	414	23.66 (4.80)	10.00	32.00
IPI-harsh	405	3.00 (1.33)	1.00	7.00
IPI-soft	404	4.60 (1.00)	1.47	7.00
BDI-II	371	11.58 (10.12)	0.00	43.00
RSES	396	30.23 (6.21)	13.00	40.00
SWLS	405	23.58 (7.13)	5.00	35.00

Note. Satisfaction = satisfaction with the mentoring relationship; RHI-M = Relational Health Indices – Mentor scale; PAQ-F = Personal Attributes Questionnaire – Femininity; IPI-harsh = mentor harsh power average based on the Interpersonal Power Inventory; IPI-soft = mentor soft power average based on the Interpersonal Power Inventory; BDI-II = Beck Depression Inventory – II; RSES = Rosenberg Self-Esteem Scale; SWLS = Satisfaction With Life Scale.

Table 2.2

Descriptive Statistics of the Distributions of Participant Scores in the Ten Complete Imputed Datasets

Variable	Mean (<i>SD</i>)	Minimum	Maximum
Satisfaction	3.81 – 3.81 (1.28 – 1.28)	1.00 – 1.00	5.00 – 5.00
RHI-M	3.31 – 3.32 (0.99 – 1.00)	1.00 – 1.00	5.00 – 5.00
PAQ-F	23.64 – 23.69 (4.78 – 4.82)	10.00 – 10.00	32.00 – 32.00
IPI-harsh	2.99 – 3.02 (1.32 – 1.34)	1.00 – 1.00	7.00 – 7.00
IPI-soft	4.58 – 4.62 (1.00 – 1.02)	1.47 – 1.47	7.00 – 7.00
BDI-II	11.69 – 11.98 (9.89 – 10.16)	0.00 – 0.00	43.00 – 46.00
RSES	30.16 – 30.28 (6.12 – 6.21)	13.00 – 13.00	40.00 – 40.00
SWLS	23.47 – 23.63 (7.06 – 7.14)	5.00 – 5.00	35.00 – 35.00

Note. Sample size is constant across the ten imputed datasets ($N = 421$). Ranges are provided for the statistic(s) across the ten imputed datasets. No imputation was needed for relationship satisfaction given there were no missing data. Satisfaction = satisfaction with the mentoring relationship; RHI-M = Relational Health Indices – Mentor scale; PAQ-F = Personal Attributes Questionnaire – Femininity; IPI-harsh = mentor harsh power average based on the Interpersonal Power Inventory; IPI-soft = mentor soft power average based on the Interpersonal Power Inventory; BDI-II = Beck Depression Inventory – II; RSES = Rosenberg Self-Esteem Scale; SWLS = Satisfaction With Life Scale.

As seen in Tables 2.1 and 2.2, some participants reported the lowest possible Beck Depression Inventory – II (BDI-II) score possible (i.e., 0), and the highest reported BDI-II score was 17 to 20 points lower than the highest possible score of 63. Based on the manual for the BDI-II (Beck et al., 1996), the mean depression score is associated with minimal depression. Participants' original scores were also examined in relation to cut-off scores provided in the BDI-II manual; the prevalence of depression in the sample was calculated using cut-off scores for mild and moderate depression. Based on these cut-off scores, 121 participants (32.6%) reported a level of symptoms associated with mild to severe depression, and 66 participants (17.8%) reported moderate to severe depression.

Prevalence rates were also calculated based on the faculty in which students were enrolled to assess the claim that certain disciplines may be more at risk for depression (e.g., Peluso et al., 2011). Prevalence rates for mild to severe depression were 29.0% ($n = 47$) for arts and social science students, 31.9% ($n = 36$) for science students, 36.8% ($n = 21$) for engineering and design students, 43.8% ($n = 14$) for public affairs students, and 25.0% ($n = 1$) for business students. Prevalence rates for moderate to severe depression were 15.4% ($n = 25$) for arts and social science students, 16.8% ($n = 19$) for science students, 17.5% ($n = 10$) for engineering and design students, 34.4% ($n = 11$) for public affairs students, and 0.0% ($n = 0$) for business students. Chi-square analyses indicated differences in the prevalence of depression between faculties were non-significant (mild-to-severe depression, $\chi^2(4) = 3.36, p = .499$; moderate-to-severe depression, $\chi^2(4) = 7.61, p = .107$). However, the reliability of these analyses was reduced by a high proportion of cells with low expected frequencies (i.e., 20% of cells had expected

frequencies below 5). Thus, Fisher's Exact Test was also conducted to compare the prevalence of depression between faculties, and these results were also non-significant (mild-to-severe depression, Fisher's Exact Test = 3.45, $p = .487$; moderate-to-severe depression, Fisher's Exact Test = 6.35, $p = .156$).

Participants' Rosenberg Self-Esteem Scale (RSES) scores covered almost the full range of possible scores (i.e., 10 to 40), and the average self-esteem score was similar to that reported for a large American adult sample (i.e., 32.62) and associated with the 47th percentile of that same American sample (Sinclair et al., 2010).⁶ Similarly, participants' Satisfaction With Life Scale (SWLS) scores covered the full range of possible scores, and the average rating was consistent with that reported in the original validation study for the scale (i.e., undergraduate student $M = 23.5$, $SD = 6.43$; Diener et al., 1985).

Correlations were also calculated between all variables included in subsequent analyses. Correlation coefficients that have been pooled across the ten imputed datasets appear in Table 2.3. As seen in Table 2.3, relationship satisfaction was positively correlated with RHI-M, IPI-soft, RSES and SWLS scores, and negatively correlated with IPI-harsh scores. Similarly, RHI-M scores were positively correlated with IPI-soft, RSES, and SWLS scores, and negatively correlated with IPI-harsh scores. In addition, those with higher PAQ-F scores reported higher RHI-M scores.⁷ Participant sex was also

⁶ Note that 10 points were added to the values reported by Sinclair et al. (2010) given the different scoring used between the two studies (i.e., the current study rated items from 1 to 4, while Sinclair et al. rated items from 0 to 3).

⁷ Relational-cultural theory has also posited that women are more likely to develop mutually authentic, engaging and empowering relationship styles than men (e.g., Jordan et al., 1991). Although this was not the focus of the current study, a 2 (mentor sex) x 2 (student sex) analysis of variance was conducted to explore this possibility. A significant but small main effect of mentor sex was detected ($F(1, 404) = 4.05$, $p = .045$; partial eta-squared = .01). Female mentors were associated with more mutually authentic, engaging, and empowering relationships (RHI-M $M = 3.44$; $SD = 0.98$) than male mentors (RHI-M $M = 3.23$; $SD = 0.99$). No significant effects were detected for student sex ($F(1, 404) = 0.38$, $p = .540$; partial eta-squared = .00), or the interaction between mentor sex and student sex ($F(1, 404) = 0.01$, $p = .926$; partial eta-squared = .00).

correlated with PAQ-F and SWLS such that females reported higher femininity and satisfaction with life. Participant PAQ-F scores were positively correlated with both IPI-harsh and IPI-soft, and IPI-harsh and IPI-soft scores were positively correlated with each other. IPI-harsh scores were positively correlated with BDI-II scores and negatively correlated with RSES and SWLS scores, while IPI-soft scores only had a small positive correlation with SWLS scores. Finally, RSES and SWLS were negatively correlated with BDI-II and positively correlated with each other.

Table 2.3

Correlation Matrix with Coefficients Pooled Over Ten Complete Imputed Datasets

	1	2	3	4	5	6	7	8
1								
2	.68***							
3	.01	.00						
4	<.01	.12*	.20***					
5	-.22***	-.30***	-.01	.13*				
6	.27***	.24***	.05	.12*	.48***			
7	-.27***	-.28***	<.01	.06	.26***	-.02		
8	.28***	.31***	<.01	.01	-.30***	.01	-.70***	
9	.32***	.38***	.14**	.05	-.24***	.11*	-.62***	.66***

* $p < .05$, 2-tailed; ** $p < .01$, 2-tailed; *** $p < .001$, 2-tailed

Note. Correlations of .10, .30, and .50 correspond to small, medium, and large effects (Cohen, 1988). Sex was dummy coded (0 = male; 1 = female). 1 = satisfaction with the mentoring relationship; 2 = Relational Health Indices – Mentor scale; 3 = Sex; 4 = Personal Attributes Questionnaire – Femininity; 5 = mentor harsh power average based on the Interpersonal Power Inventory; 6 = mentor soft power average based on the Interpersonal Power Inventory; 7 = Beck Depression Inventory – II; 8 = Rosenberg Self-Esteem Scale; 9 = Satisfaction With Life Scale.

Hypothesis Testing

All four hypotheses were tested using hierarchical multiple regressions. Three regressions were run to test Hypothesis 1. Each of the three psychological health outcomes (i.e., depression, self-esteem, life satisfaction) was regressed on relational mentoring, controlling for relationship satisfaction. Three moderated multiple regressions were run to test Hypotheses 2 through 4. Each of the three psychological health outcomes was regressed on all predictors and their interactions (as described in more detail below). Prior to completing these regressions, data were rigorously screened to ensure all assumptions for analysis were met. All data were screened for the assumptions of moderated multiple regression given overlap in the variables used in the regressions and given the stricter assumptions required for the moderated multiple regressions.

Moderated multiple regression (MMR) assumptions. The ten complete imputed datasets were individually screened to ensure all assumptions of MMR were met for the regressions planned with Beck Depression Inventory – II (BDI-II), Rosenberg Self-Esteem Scale (RSES), and Satisfaction With Life Scale (SWLS) scores as outcomes (Aguinis, 2004). Homogeneity of variance was tested between moderator-based subgroups (i.e., males versus females) for each of the three outcome variables for each of the ten imputed datasets. In all cases, the ratio of largest to smallest variance never approached 1.5, the level at which the regression results would begin to be distorted by heterogeneous variances (DeShon & Alexander, 1996).

Only one univariate outlier was detected; one participant had a BDI-II score of 46 in imputation 7, which was associated with a z -score of 3.43 ($p < .001$). This one outlier

was not brought within range given that BDI-II scores were later found to be significantly skewed and transformation was applied to the variable. Significant skews were consistently detected across all imputed datasets for relationship satisfaction ($z = -7.31, p < .001$), Interpersonal Power Inventory - harsh (IPI-harsh z 's from 3.77 to 4.16, $p < .001$), BDI-II (z 's from 8.80 to 9.66, $p < .001$), and SWLS (z 's from -4.14 to -3.29, $p < .001$) scores. Significant skews were also found for Interpersonal Power Inventory – soft (IPI-soft) scores for eight of the ten imputed datasets (z 's from -3.60 to -3.29, $p < .001$). Normal distributions were achieved through square root transformations of IPI-harsh and BDI-II scores, reflected square root transformations of IPI-soft and SWLS scores, and a reflected log transformation of relationship satisfaction scores.

Regression analyses were run with both transformed and untransformed variables to compare results; results were identical with regard to the significance and direction of associations with outcomes with two exceptions. First, relationship satisfaction was significantly associated with BDI-II in Model 2 of a moderated multiple regression with transformed but not untransformed variables. Second, relationship satisfaction was significantly associated with SWLS in Model 3 of a moderated multiple regression with transformed but not untransformed variables. However, relationship satisfaction served as a covariate and was not of primary interest in the study. Relationship satisfaction was merely meant to be partialled out of the other effects, which appeared to be effective in both the transformed and untransformed regressions given the identical results with regards to the other predictors. Further, in the second case, the model with the discrepancy (i.e., Model 3) was not significant overall and therefore was not the focus of

interpretation. Therefore, the results with untransformed variables are reported here to ease interpretation of the results.

Further assumptions were tested in the course of the regressions. Tolerance values from each regression exceeded 0.2, indicating a lack of multicollinearity (also see no correlations approached .80 in Table 2.3). No multivariate outliers were detected; Cook's distance never approached 1 in any of the imputations in any of the regressions, and the pooled average Cook's distance across all imputed datasets was 0.003 in all regressions. Durbin-Watson statistics across all regressions varied between 1 and 3, as expected, indicating independence of errors. Examination of plots of standardized residuals at each predicted score in each regression failed to indicate issues with linearity and homoscedasticity. Thus, the results of the regressions could be interpreted as statistically valid.

Hypothesis 1: The correlation between relational mentoring and student psychological health. Hypothesis 1 predicted that relational mentoring would be significantly correlated with student psychological health such that relationships characterized by greater mutual authenticity, engagement, and empowerment would be associated with better psychological health. This hypothesis was tested with three regressions for three psychological health outcomes (i.e., depression, self-esteem, life satisfaction). Relationship satisfaction was first entered as a covariate in the first block of each hierarchical regression, followed by Relational Health Indices – Mentor (RHI-M) in the second block of each regression. Both quantitative predictors were standardized prior to entering the regressions so results would be consistent with those of moderated multiple regressions completed later to test Hypotheses 2 through 4 (standardization of

variables is recommended for moderated multiple regression; Aguinis, 2004). A reduced alpha of .017 was used to preserve a family-wise Type I error rate of .05 across the three regressions.

Beck Depression Inventory-II (BDI-II) scores were regressed on relationship satisfaction (in Model 1) and Relational Health Indices-Mentor (RHI-M) scale scores (in Model 2). Consistent with Hypothesis 1, RHI-M was significantly associated with BDI-II scores. As seen in Table 2.4, Model 1 was significant across all ten imputed datasets. Based on the squared correlation associated with Model 1, between 7% and 9% of the variability in BDI-II scores was accounted for by variation in the covariate (relationship satisfaction) across the ten imputed datasets. The Cohen's f^2 associated with the effect of relationship satisfaction in Model 1 ranged from 0.072 to 0.099 across the ten imputed datasets, corresponding to a small to medium effect (small $f^2 = 0.02$; medium $f^2 = 0.15$; Cohen, 1988). Model 2 was significant for seven of the ten imputed datasets. Based on the change in the squared multiple correlation coefficient associated with Model 2, adding RHI-M accounted for an additional 1% to 2% of variability in BDI-II scores across the ten imputed datasets. The Cohen's f^2 associated with the addition of RHI-M in Model 2 ranged from 0.010 to 0.025 across the ten imputed datasets, corresponding to a small effect (small = 0.02; Cohen, 1988). Specifically, an increase of one standard deviation in RHI-M scores was associated with a decrease in BDI-II scores of 1.73 points.

Table 2.4

Multiple Regression (Pooled Over Ten Imputed Datasets): Beck Depression Inventory-II Scores on Mentoring Relationship Satisfaction and Relational Mentoring

Model	Predictor	<i>B</i>	<i>SE B</i>	β	<i>p</i>
1	Satisfaction	-2.76	0.49	-0.30, -0.26	< .001
2	Satisfaction	-1.58	0.67	-0.20, -0.13	.019
	RHI-M	-1.73	0.70	-0.20, -0.13	.014

Model 1 $R^2 = 0.07 - 0.09$, $p < .001$ across 10 imputed datasets

Model 2 $\Delta R^2 = 0.01 - 0.02$, $p = .001 - .041$ across 10 imputed datasets

Note. Adjusted $\alpha = .017$. Ranges are provided for statistics that were not pooled across the 10 imputed datasets in the regression outputs. Satisfaction = satisfaction with the mentoring relationship; RHI-M = Relational Health Indices – Mentor scale

Rosenberg Self-Esteem Scale (RSES) scores were regressed on relationship satisfaction (in Model 1) and Relational Health Indices-Mentor (RHI-M) scale scores (in Model 2). Consistent with Hypothesis 1, RHI-M was significantly associated with RSES scores. As seen in Table 2.5, Model 1 was significant across all ten imputed datasets. Based on the squared correlation associated with Model 1, between 8% and 9% of the variability in RSES scores was accounted for by variation in the covariate (relationship satisfaction) across the ten imputed datasets. The Cohen's f^2 associated with the effect of relationship satisfaction in Model 1 ranged from 0.082 to 0.097 across the ten imputed datasets, corresponding to a small to medium effect (small $f^2 = 0.02$; medium $f^2 = 0.15$; Cohen, 1988). Model 2 was also significant for all of the ten imputed datasets. Based on

the change in the squared multiple correlation coefficient associated with Model 2, adding RHI-M accounted for an additional 2% to 3% of variability in RSES scores across the ten imputed datasets. The Cohen's f^2 associated with the addition of RHI-M in Model 2 ranged from 0.022 to 0.038 across the ten imputed datasets, corresponding to a small effect (small = 0.02; Cohen, 1988). Specifically, an increase of one standard deviation in RHI-M scores was associated with an increase in RSES scores of 1.38 points.

Table 2.5

Multiple Regression (Pooled Over Ten Imputed Datasets): Rosenberg Self-Esteem Scale Scores on Mentoring Relationship Satisfaction and Relational Mentoring

Model	Predictor	<i>B</i>	<i>SE B</i>	β	<i>p</i>
1	Satisfaction	1.75	0.29	0.28, 0.30	< .001
2	Satisfaction	0.81	0.41	0.11, 0.16	.047
	RHI-M	1.38	0.41	0.20, 0.25	.001

Model 1 $R^2 = 0.08 - 0.09$, $p < .001$ across 10 imputed datasets

Model 2 $\Delta R^2 = 0.02 - 0.03$, $p < .001 - p = .002$ across 10 imputed datasets

Note. Adjusted $\alpha = .017$. Ranges are provided for statistics that were not pooled across the 10 imputed datasets in the regression outputs. Satisfaction = satisfaction with the mentoring relationship; RHI-M = Relational Health Indices – Mentor scale

Satisfaction With Life Scale (SWLS) scores were regressed on relationship satisfaction (in Model 1) and Relational Health Indices-Mentor (RHI-M) scale scores (in Model 2). Consistent with Hypothesis 1, RHI-M was significantly associated with SWLS

scores. As seen in Table 2.6, Model 1 was significant across all ten imputed datasets. Based on the squared correlation associated with Model 1, between 10% and 11% of the variability in SWLS scores was accounted for by variation in the covariate (relationship satisfaction) across the ten imputed datasets. The Cohen's f^2 associated with the effect of relationship satisfaction in Model 1 ranged from 0.112 to 0.120 across the ten imputed datasets, which is approaching a medium effect (small $f^2 = 0.02$; medium $f^2 = 0.15$; Cohen, 1988). Model 2 was also significant for all of the ten imputed datasets. Based on the change in the squared multiple correlation coefficient associated with Model 2, adding RHI-M accounted for an additional 4% to 5% of variability in SWLS scores across the ten imputed datasets. The Cohen's f^2 associated with the addition of RHI-M in Model 2 ranged from 0.043 to 0.065 across the ten imputed datasets, corresponding to a small to medium effect (small $f^2 = 0.02$; medium $f^2 = 0.15$; Cohen, 1988). Specifically, an increase of one standard deviation in RHI-M scores was associated with an increase in SWLS scores of 2.07 points.

Table 2.6

Multiple Regression (Pooled Over Ten Imputed Datasets): Satisfaction With Life Scale Scores on Mentoring Relationship Satisfaction and Relational Mentoring

Model	Predictor	<i>B</i>	<i>SE B</i>	β	<i>p</i>
1	Satisfaction	2.29	0.33	0.32, 0.33	< .001
2	Satisfaction	0.87	0.45	0.10, 0.14	.052
	RHI-M	2.07	0.46	0.26, 0.32	< .001

Model 1 $R^2 = 0.10 - 0.11, p < .001$ across 10 imputed datasets

Model 2 $\Delta R^2 = 0.04 - 0.05, p < .001$ across 10 imputed datasets

Note. Adjusted $\alpha = .017$. Ranges are provided for statistics that were not pooled across the 10 imputed datasets in the regression outputs. Satisfaction = satisfaction with the mentoring relationship; RHI-M = Relational Health Indices – Mentor scale

Hypotheses 2-4: Moderation of the correlation between relational mentoring and student psychological health. Hypothesis 2 predicted that the association between the relational dimensions of mentoring and psychological health was significantly moderated by student sex such that associations would be stronger for female students. Hypothesis 3 predicted that the association between relational mentoring and psychological health was significantly moderated by student femininity such that associations would be stronger for students with more feminine traits. Hypothesis 4 predicted that the association between relational mentoring and psychological health was significantly moderated by power such that associations would be stronger for students with lower power (reporting that their faculty mentors had relatively higher power).

These three hypotheses were simultaneously tested in each of three moderated multiple regressions (MMRs). Each moderated multiple regression included one of three psychological health outcomes: depression, self-esteem, and life satisfaction.

In these regressions, mentoring relationship satisfaction was a covariate, Relational Health Indices – Mentor scale (RHI-M) score was a predictor, and sex, Personal Attributes Questionnaire – Femininity (PAQ-F), and Interpersonal Power Inventory – harsh (IPI-harsh) and Interpersonal Power Inventory – soft (IPI-soft) were moderators. Sex was dummy coded (0 = male; 1 = female) and all quantitative predictors and moderators were standardized prior to entering the models (Aguinis, 2004). The covariate was entered in the first block of each hierarchical regression, all predictors and moderators in the second block, and four interactions in the third block (sex x RHI-M, PAQ-F x RHI-M, IPI-Harsh x RHI-M, and IPI-Soft x RHI-M). The MMRs were first conducted with a fourth block containing interactions between the covariate and all other predictors/moderators (to assess whether relationship satisfaction is truly a covariate or is actually a moderator); however, since these interactions were non-significant, this step was removed in the final analyses. A reduced alpha of .017 was used to preserve a family-wise Type I error rate of .05 across the three moderated multiple regressions.

Beck Depression Inventory-II (BDI-II) scores were regressed on each of the predictors and interaction effects specified above. Contrary to Hypotheses 2 through 4, no moderating effects were detected. As Table 2.7 illustrates, only Models 1 and 2 (i.e., not Model 3 with the moderation effects) were significant across all ten imputed datasets. Based on the R^2 associated with Model 1, between 7% and 9% of variability in BDI-II scores were accounted for by variation in the covariate (relationship satisfaction) across

the ten imputed datasets. The Cohen's f^2 associated with the effect of relationship satisfaction in Model 1 ranged from 0.072 to 0.099 across the ten imputed datasets, corresponding to a small to medium effect (small $f^2=0.02$; medium $f^2=0.15$; Cohen, 1988). Based on the change in the R^2 associated with Model 2, adding Relational Health Indices – Mentor scale (RHI-M), sex, Personal Attributes Questionnaire – Femininity (PAQ-F), and Interpersonal Power Inventory - harsh (IPI-harsh) and Interpersonal Power Inventory – soft (IPI-soft) accounted for an additional 5% to 7% of variability in BDI-II scores across the ten imputed datasets. The Cohen's f^2 associated with the effects in Model 2 ranged from 0.053 to 0.082 across the ten imputed datasets, corresponding to a small to medium effect (small $f^2=0.02$; medium $f^2=0.15$; Cohen, 1988).

The addition of the moderating effects of sex, PAQ-F, and IPI-harsh and IPI-soft (i.e., their interactions with RHI-M) did not significantly add to the prediction of BDI-II scores; based on the change in the R^2 associated with Model 3, only 1% of variability in depression scores was accounted for by these interactions across the ten imputed datasets. Only three of the ten imputed datasets yielded results with a change in the squared multiple correlation coefficient of 0.01 to 0.02 (an effect size for a moderating effect that could be considered noteworthy; Aguinis, 2004). Further, the Cohen's f^2 associated with the moderating effects entered in Model 3 of the regression ranged from 0.007 to 0.016 over the ten imputed datasets, which is lower than a small effect size ($f^2 = 0.02$; Cohen, 1988). There was no evidence of any moderating effects; thus, conditional effects were instead interpreted from Model 2. As seen in Table 2.7, the only significant conditional effect in Model 2 was Interpersonal Power Inventory – harsh (IPI-harsh) score; specifically, an increase of one standard deviation in the IPI-harsh score was associated

with an increase of 2.40 points on the Beck Depression Inventory-II, while holding all other variables constant.

Table 2.7

Moderated Multiple Regression (Pooled Over Ten Imputed Datasets): Student Depression on Mentoring Relationship Satisfaction, Relational Mentoring, Student Sex, Student Femininity, Harsh and Soft Mentor Power and Interaction Effects

Model	Predictor	<i>B</i>	SE <i>B</i>	β	<i>p</i>
1	Satisfaction	-2.76	0.49	-0.30, -0.26	<.001
2	Satisfaction	-1.26	0.68	-0.16, -0.09	.065
	RHI-M	-1.10	0.72	-0.14, -0.08	.124
	Sex	0.05	1.12	-0.02, 0.04	.968
	PAQ-F	0.53	0.50	0.03, 0.07	.289
	IPI-harsh	2.40	0.66	0.20, 0.27	<.001
	IPI-soft	-0.84	0.61	-0.10, -0.06	.172
3	Satisfaction	-1.07	0.70	-0.15, -0.08	.126
	RHI-M	-1.20	1.03	-0.16, -0.08	.246
	Sex	0.00	1.12	-0.02, 0.04	.998
	PAQ-F	0.49	0.51	0.03, 0.07	.334
	IPI-harsh	2.32	0.66	0.19, 0.26	.001
	IPI-soft	-0.71	0.63	-0.09, -0.05	.253
	Sex x RHI-M	0.32	1.06	-0.02, 0.06	.760
	PAQ-F x	-0.34	0.55	-0.07, -0.01	.529

RHI-M				
IPI-harsh x	-0.80	0.55	-0.12, -0.05	.147
RHI-M				
IPI-soft x	0.76	0.56	0.05, 0.12	.176
RHI-M				

Model 1 $R^2 = 0.07 - 0.09$, $p < .001$ across 10 imputed datasets

Model 2 $\Delta R^2 = 0.05 - 0.07$, $p < .001 - p = .001$ across 10 imputed datasets

Model 3 $\Delta R^2 = 0.01$, $p = .145 - .562$ across 10 imputed datasets

Note. Adjusted $\alpha = .017$. Ranges are provided for statistics that were not pooled across the 10 imputed datasets in the regression outputs. Sex was dummy coded (0 = male; 1 = female). Satisfaction = satisfaction with the mentoring relationship; RHI-M = Relational Health Indices – Mentor scale; PAQ-F = Personal Attributes Questionnaire – Femininity; IPI-harsh = Interpersonal Power Inventory – harsh; IPI-soft = Interpersonal Power Inventory - soft

Rosenberg Self-Esteem Scale (RSES) scores were regressed on each of the predictors and interaction effects specified above. Contrary to Hypotheses 2 through 4, no moderating effects were detected. As Table 2.8 illustrates, only Models 1 and 2 (i.e., not Model 3 with the moderation effects) were significant across all ten imputed datasets. Based on the R^2 associated with Model 1, between 8% and 9% of variation in RSES scores was accounted for by variation in the covariate (relationship satisfaction) across the ten imputed datasets. The Cohen's f^2 associated with the effect of relationship satisfaction in Model 1 ranged from 0.082 to 0.097 across the ten imputed datasets,

corresponding to a small to medium effect (small $f^2=0.02$; medium $f^2=0.15$; Cohen, 1988). Based on the change in the R^2 associated with Model 2, adding Relational Health Indices – Mentor scale (RHI-M), sex, Personal Attributes Questionnaire - Femininity (PAQ-F), and Interpersonal Power Inventory – Harsh (IPI-Harsh) and Interpersonal Power Inventory – Soft (IPI-Soft) accounted for an additional 6% to 9% of variation in RSES scores across the ten imputed datasets. The Cohen's f^2 associated with the effects in Model 2 ranged from 0.073 to 0.110 across the ten imputed datasets, corresponding to a small to medium effect (small $f^2=0.02$; medium $f^2=0.15$; Cohen, 1988).

The addition of the moderating effects of sex, PAQ-F, and IPI-Harsh and IPI-Soft (i.e., their interactions with RHI-M) did not significantly add to the prediction of RSES scores; based on the change in the R^2 associated with Model 3, an additional 0% to 1% of variability in RSES scores was accounted for by these interactions across the ten imputed datasets. The squared multiple correlations produced in the regressions for Model 3 were not consistent with the 1-2% threshold set out by Aguinis (2004) to indicate a noteworthy moderating effect. Further, the Cohen's f^2 associated with the moderating effects in Model 3 varied between 0.002 and 0.008 across the ten imputed datasets, which would be considered an extremely small effect (small Cohen's $f^2=0.02$; Cohen, 1988). There was no evidence of any moderating effects; thus, conditional effects were instead interpreted from Model 2. As seen in Table 2.8, only IPI-Harsh was significantly predictive of RSES scores in Model 2; specifically, an increase of one standard deviation in the IPI-Harsh scores was associated with a decrease of 1.69 points in RSES scores while holding all other variables constant.

Table 2.8

Moderated Multiple Regression (Pooled Over Ten Imputed Datasets): Student Self-Esteem on Mentoring Relationship Satisfaction, Relational Mentoring, Student Sex, Student Femininity, Harsh and Soft Mentor Power and Interaction Effects

Model	Predictor	<i>B</i>	SE <i>B</i>	β	<i>p</i>
1	Satisfaction	1.75	0.29	0.28, 0.30	<.001
2	Satisfaction	0.68	0.41	0.09, 0.14	.095
	RHI-M	0.84	0.42	0.11, 0.16	.047
	Sex	-0.12	0.64	-0.04, 0.01	.854
	PAQ-F	0.11	0.30	0.00, 0.04	.705
	IPI-harsh	-1.69	0.39	-0.30, -0.25	<.001
	IPI-soft	0.49	0.38	0.06, 0.11	.195
3	Satisfaction	0.62	0.41	0.07, 0.12	.137
	RHI-M	1.02	0.61	0.13, 0.21	.095
	Sex	-0.06	0.64	-0.03, 0.01	.928
	PAQ-F	0.16	0.30	0.01, 0.05	.609
	IPI-harsh	-1.66	0.39	-0.29, -0.24	<.001
	IPI-soft	0.44	0.39	0.05, 0.10	.253
	Sex x RHI-M	-0.25	0.64	-0.06, 0.00	.693
	PAQ-F x	-0.22	0.31	-0.05, -0.02	.477
	RHI-M				
	IPI-harsh x	0.35	0.32	0.05, 0.08	.270
	RHI-M				

IPI-soft x	-0.20	0.33	-0.05, -0.02	.532
RHI-M				

Model 1 $R^2 = 0.08 - 0.09, p < .001$ across 10 imputed datasets

Model 2 $\Delta R^2 = 0.06 - 0.09, p < .001$ across 10 imputed datasets

Model 3 $\Delta R^2 = 0.00 - 0.01, p = .488 - .875$ across 10 imputed datasets

Note. Adjusted $\alpha = .017$. Ranges are provided for statistics that were not pooled across the 10 imputed datasets in the regression outputs. Sex was dummy coded (0 = male; 1 = female). Satisfaction = satisfaction with the mentoring relationship; RHI-M = Relational Health Indices – Mentor scale; PAQ-F = Personal Attributes Questionnaire – Femininity; IPI-harsh = Interpersonal Power Inventory – harsh; IPI-soft = Interpersonal Power Inventory - soft

Satisfaction With Life Scale (SWLS) scores were regressed on each of the predictors and interaction effects specified above. Contrary to Hypotheses 2 through 4, no moderating effects were detected. As Table 2.9 illustrates, only Models 1 and 2 (i.e., not Model 3 with the moderation effects) were significant across all ten imputed datasets. Based on the R^2 associated with Model 1, between 10% and 11% of variability in SWLS scores were accounted for by variation in the covariate (relationship satisfaction) across the ten imputed datasets. The Cohen's f^2 associated with the effect of relationship satisfaction in Model 1 ranged from 0.112 to 0.120 across the ten imputed datasets, which is approaching a medium effect (small $f^2=0.02$; medium $f^2=0.15$; Cohen, 1988). Based on the change in the R^2 associated with Model 2, adding Relational Health Indices – Mentor scale (RHI-M), sex, Personal Attributes Questionnaire – Femininity (PAQ-F), and

Interpersonal Power Inventory – harsh (IPI-harsh) and Interpersonal Power Inventory – soft (IPI-soft) accounted for an additional 8% to 10% of variability in SWLS scores across the ten imputed datasets. The Cohen's f^2 associated with the effects in Model 2 ranged from 0.101 to 0.131 across the ten imputed datasets, most closely corresponding to a medium effect (small $f^2=0.02$; medium $f^2=0.15$; Cohen, 1988).

The addition of the moderating effects of sex, PAQ-F, and IPI-harsh and IPI-soft (i.e., their interactions with RHI-M) did not significantly add to the prediction of SWLS scores; based on the change in the R^2 associated with Model 3, only an additional 1% of variability in SWLS scores was accounted for by these interactions across the ten imputed datasets. Only five of the ten imputed datasets yielded results with a change in the squared multiple correlation coefficient of 0.01 to 0.02 (an effect size for a moderating effect that could be considered noteworthy; Aguinis, 2004). Further, the Cohen's f^2 associated with the moderating effects entered in Model 3 of the regression ranged from 0.006 to 0.018 over the ten imputed datasets, which is lower than a small effect size ($f^2 = 0.02$; Cohen, 1988). There was no evidence of any moderating effects; thus, conditional effects were instead interpreted from Model 2. As seen in Table 2.9, several conditional effects significantly predicted life satisfaction (with a reduced alpha of .017); in particular, SWLS scores were related to RHI-M scores, sex, and IPI-harsh. Specifically, an increase of one standard deviation in RHI-M scores was associated with an increase of 1.56 points in SWLS scores, while holding all other variables constant. Females (coded as 1) were associated with an SWLS score that was 1.96 points higher than males, while holding all other variables constant. Finally, an increase of one

standard deviation in IPI-harsh scores was associated with a decrease in SWLS scores of 1.55 units.

Table 2.9

Moderated Multiple Regression (Pooled Over Ten Imputed Datasets): Student Life Satisfaction on Mentoring Relationship Satisfaction, Relational Mentoring, Student Sex, Student Femininity, Harsh and Soft Mentor Power and Interaction Effects

Model	Predictor	<i>B</i>	SE <i>B</i>	β	<i>p</i>
1	Satisfaction	2.29	0.33	0.32, 0.33	<.001
2	Satisfaction	0.63	0.45	0.07, 0.11	.165
	RHI-M	1.56	0.48	0.19, 0.24	.001
	Sex	1.96	0.70	0.11, 0.14	.005
	PAQ-F	0.09	0.33	0.01, 0.02	.784
	IPI-harsh	-1.55	0.43	-0.23, -0.19	<.001
	IPI-soft	0.93	0.42	0.11, 0.15	.027
3	Satisfaction	0.57	0.46	0.06, 0.10	.210
	RHI-M	2.11	0.70	0.26, 0.35	.002
	Sex	2.06	0.70	0.12, 0.15	.003
	PAQ-F	0.16	0.33	0.02, 0.03	.630
	IPI-harsh	-1.53	0.43	-0.23, -0.19	<.001
	IPI-soft	0.89	0.43	0.10, 0.14	.039
	Sex x RHI-M	-0.79	0.72	-0.13, -0.07	.273
	PAQ-F x	-0.36	0.37	-0.07, -0.03	.323

RHI-M				
IPI-harsh x	0.47	0.37	0.05, 0.10	.200
RHI-M				
IPI-soft x	-0.11	0.37	-0.04, 0.00	.757
RHI-M				

Model 1 $R^2 = 0.10 - 0.11, p < .001$ across 10 imputed datasets

Model 2 $\Delta R^2 = 0.08 - 0.10, p < .001$ across 10 imputed datasets

Model 3 $\Delta R^2 = 0.01, p = .142 - .622$ across 10 imputed datasets

Note. Adjusted $\alpha = .017$. Ranges are provided for statistics that were not pooled across the 10 imputed datasets in the regression outputs. Sex was dummy coded (0 = male; 1 = female). Satisfaction = satisfaction with the mentoring relationship; RHI-M = Relational Health Indices – Mentor scale; PAQ-F = Personal Attributes Questionnaire – Femininity; IPI-harsh = Interpersonal Power Inventory – harsh; IPI-soft = Interpersonal Power Inventory - soft

Statistical *Post-Hoc* Power Analyses

Analyses were conducted to assess the statistical power present in each of the moderated multiple regressions (MMRs) to assess the likelihood of low statistical power being the cause of the non-significant findings regarding moderating effects. Each MMR had the same characteristics, other than the exact measure used as an outcome, so only one calculation was required to determine the power of each MMR. An online post-hoc statistical power calculator for hierarchical multiple regression was used in this analysis (Soper, 2014). Based on a reduced alpha of .017, a total sample size of 421 participants,

4 predictors in the step with moderating effects and 6 predictors in the previous step, an effect size of $f^2=0.037$ would be needed to achieve 80% power; in other words, the design had an 80% chance of detecting a true moderating effect of a relatively small size (small $f^2=0.02$; medium $f^2=0.15$; Cohen, 1988). If the results were evaluated with an unadjusted alpha of .05, an effect size of only 0.029 would be needed to achieve 80% power. The design was associated with power approaching 100% to detect a moderating effect of medium size.

Discussion

Cross-sectional data collected from an online survey of Canadian graduate students in mentoring relationships with faculty thesis advisors were analyzed to describe the sample and the mentoring relationships, and to test four hypotheses regarding the correlation between relational mentoring and student psychological health.

Descriptive Statistics

Descriptive statistics were first calculated to explore the graduate student survey data. Findings from these descriptive analyses contribute to three areas of understanding: 1) the quality of mentoring between faculty thesis advisors and graduate students, 2) the state of the psychological health of Canadian graduate students from multiple disciplines, and 3) the construct validity of the Relational Health Indices – Mentor (RHI-M) scale and Interpersonal Power Inventory (IPI).

The quality of mentoring between faculty thesis advisors and graduate students. The average scores for both relationship satisfaction and the Relational Health Indices – Mentor (RHI-M) scale (and the negative skew in satisfaction scores detected during data screening) indicated that the overall sample had generally positive, mutually

authentic, engaging, and empowering mentoring relationships with their thesis advisors. This may be expected given the inherent positive nature generally ascribed to mentoring relationships (e.g., Schlosser, Knox, Moskovitz, & Hill, 2003). However, the observation that the range of both relationship satisfaction and RHI-M scores of mutual authenticity, engagement, and empowerment, covered the full range of possible scores suggests that a substantial self-selection bias was unlikely for this sample. Further, the overall similarity of satisfaction and RHI-M scores to those reported in previous research (Liang et al., 2002a; Peluso et al., 2011) indicates that the sample should at least be no more positively biased than those included in previous research. In fact, RHI-M scores were slightly lower than those reported by Liang et al. (2002a). This is worth noting given experts in the field have expressed concerns regarding a positive sampling bias in the mentoring literature (e.g., overrepresentation of students with positive mentoring relationships; Johnson et al., 2007).

Similarly, the wide range of Interpersonal Power Inventory – harsh (IPI-harsh) and Interpersonal Power Inventory – soft (IPI-soft) scores also suggests that a substantial self-selection bias was unlikely for this sample, although again, average scores indicated relationships were overall positive with higher levels of mentor soft (i.e., positive, noncoercive) power than harsh (i.e., punitive, coercive) power. No comparison data were available in the literature. Thus, the descriptive statistics from this study fill a critical gap in our understanding of the power dynamics of faculty-graduate student mentoring relationships. The importance of these data is underscored by the study's significant findings regarding the correlation between mentor power and student psychological health (discussed below).

The state of the psychological health of Canadian graduate students from multiple disciplines. Participant reports of their psychological health varied and presented a mixed picture of students' overall psychological health. In particular, average scores on the Rosenberg Self-Esteem Scale (RSES) were similar to those reported in a large community sample of Americans (Sinclair et al., 2010), and average scores on the Satisfaction With Life Scale (SWLS) resembled those reported in Diener et al.'s (1985) validation sample of university students. Overall, women reported significantly higher life satisfaction than men, although the correlation corresponded to a small effect (Cohen, 1988), which is consistent with the findings of Arrindell, Heesink, and Feij (1999) in their research on a sample of young adults in the Netherlands. Other research has found that women reported higher life satisfaction but these small differences were not significant (Maltby & Day, 2004). Thus, this sample of graduate students appears fairly representative of the general population in terms of self-esteem and life satisfaction.

In contrast, participant reports of depressive symptoms appeared elevated relative to the general population. The current sample had an average BDI-II score associated with minimal depression and 32.6% of the current sample reported what would be considered mild to severe depressive symptoms. This is similar to the prevalence of clinically significant depressive symptoms (i.e., 33%) reported in a Canadian sample of psychology graduate students (Peluso et al., 2011). As Peluso et al. (2011) pointed out, this prevalence appears elevated relative to the general population. Kessler et al. (2003) reported a lifetime prevalence of a major depressive disorder of 16.2% in an American community sample. However, comparisons among these three studies are difficult given

the variety of measures used; I used the Beck Depression Inventory – II (BDI-II; Beck et al., 1996), Peluso et al. (2011) used the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), and Kessler et al. (2003) used the World Health Organization’s Composite International Diagnostic Interview (Robins et al., 1988, as cited in Kessler et al., 2003).

Peluso et al.’s (2011) conclusion that psychology graduate students appear to be at increased risk of depression relative to students in other disciplines is not supported by the current results, which demonstrated comparable rates of depressive symptoms between arts/social science students (including psychology students) and science students. Higher rates were actually reported for students in engineering/design and public affairs, although these differences were not significant and the relatively smaller sample sizes for these groups make comparisons with the larger samples of arts/social science and science students more tenuous. In summary, the current results suggest graduate students in multiple disciplines may be at increased risk of depression in particular, relative to the general population, although comparisons are difficult given the varied measures of depression used in the literature. These findings suggest the importance of the provision of psychological health care services to graduate students and underscore the importance of research into factors impacting the psychological health of graduate students across disciplines, including the current study.

The construct validity of the Relational Health Indices – Mentor (RHI-M) scale and Interpersonal Power Inventory (IPI). RHI-M scores of relational mentoring were positively correlated with ratings of mentoring relationship satisfaction. This correlation would be expected given these relational dimensions are predicted to be

associated with growth and better psychological health in relational-cultural theory (RCT; e.g., Jordan et al., 1991). In addition, RHI-M scores were positively correlated with IPI-soft scores and negatively correlated with IPI-harsh scores. These correlations would be expected given the RCT concept of mutual empowerment included in the RHI-M scale implies a softer, noncoercive version of power in the relationship. Specifically, relational-cultural theory was established to describe women's development and suggested that women's views of traditional conceptualizations of power as selfish and destructive makes them more comfortable with shared and mutual power (Miller, 1991b). Taken together, these findings support the construct validity of the RHI-M scale.

IPI-harsh and IPI-soft scores were positively correlated. This seems counterintuitive given differences observed in the patterns of correlations with other variables (e.g., RHI-M, psychological health measures). However, these correlations are consistent with other research demonstrating there is an overall concept of social power, which is made up of two factors (i.e., harsh and soft power; Raven et al., 1998) that have different effects (Pierro et al., 2008). In other words, it appears that a faculty mentor may have both harsh and soft social power in relation to their graduate student protégé, but it is the harsh power that is problematic (i.e., in terms of its association with students' poor psychological health). Further, PAQ-Femininity scores were positively correlated with IPI-harsh and IPI-soft scores. This suggests that those participants who identified with more feminine characteristics reported their mentors to have greater overall power over them. This is consistent with the passivity and submission associated with traditional feminine identities. For example, relational-cultural theory suggested that women's subordination in society influenced women's socialization to focus on relationships

(Miller, 1986), and nurturance and interpersonal warmth are generally reflected in Femininity items on the PAQ (Deaux, 1985). Taken together, these results generally support the construct validity of the IPI.

Hypothesis Testing

Hypothesis 1: The correlation between relational mentoring and student psychological health. Hypothesis 1 predicted a positive correlation between greater mutual engagement, authenticity, and empowerment in mentoring between graduate students and their faculty thesis advisors, and better student psychological health. In particular, relational mentoring was measured with the Relational Health Indices – Mentor (RHI-M) scale and three psychological health outcomes were assessed through the Beck Depression Inventory – II (BDI-II), the Rosenberg Self-Esteem Scale (RSES), and the Satisfaction With Life Scale (SWLS). Hypothesis 1 was supported given that RHI-M scores were significantly negatively correlated with BDI-II scores, and positively correlated with RSES and SWLS scores, albeit with small effects. Further, mentoring relational dynamics were significantly correlated with psychological health while the structural aspects of the relationship (e.g., duration of the relationship, frequency of contact) were not. These findings are consistent with the associations found by Liang et al. (2002a) between RHI-M scores and psychological outcomes (i.e., self-esteem and loneliness) in a female sample of undergraduate students with mentors, including some faculty mentors. These findings fill a critical gap in the literature by revealing this correlation in a sample of male and female graduate students with faculty mentors. This correlation supports relational-cultural theory's (RCT's) general proposition that development within mutually engaging, empowering and authentic (i.e., “growth-

fostering”) connections is associated with positive psychological health (e.g., Jordan, 2008).

In addition, these study results support recent theoretical developments in the mentoring literature, particularly the concept of relational mentoring described in Johnson’s (2014) mentoring relationship continuum (MRC) model. Johnson’s (2014) discussion of relational mentoring (e.g., mutual learning and growth, empathy and vulnerability) appears similar to the mutual authenticity, engagement, and empowerment outlined in relational-cultural theory (e.g., Jordan et al., 1991) and measured in the RHI-M scale. In the MRC model, relational mentoring is described as holistic and impacting a range of outcomes, including personal outcomes (Johnson, 2014). The current results are consistent with this model, and suggest relational mentoring is associated with student psychological health. Longitudinal research is needed to demonstrate a causal relationship between these variables, but the current results provide an important foundation for such research to validate these aspects of the MRC model. Future research may also explore factors impacting the relational dimensions of mentoring. For example, Johnson (2014) discussed the potential impact of the traits and abilities of both mentors and protégés generally to the presence of mentoring qualities in developmental relationships, and relational-cultural theory specifically suggests women may be more likely to cultivate mutually engaging, authentic, and empowering relationships (e.g., Jordan et al., 1991). In the meantime, based on these study results it is recommended that graduate students and faculty mentors attend to the relational dimensions of mentoring to enhance student psychological health.

Hypotheses 2-4: Moderation of the correlation between relational mentoring and student psychological health. Hypothesis 2 predicted that the correlation between relational mentoring and psychological health would be significantly moderated by student sex such that associations would be stronger for female students. Hypothesis 3 predicted that the correlation between relational mentoring and psychological health would be significantly moderated by student femininity such that associations would be stronger for students with more feminine traits. Hypothesis 4 predicted that the correlation between relational mentoring and psychological health would be significantly moderated by power such that associations would be stronger for students with lower power (reporting that their faculty mentors had relatively higher power) than other students. Hypotheses 2 to 4 were not supported for any of the three psychological health outcomes examined (i.e., depression, self-esteem, life satisfaction). The results suggest that greater mutual authenticity, engagement, and empowerment in faculty-graduate student mentoring is correlated with better graduate student psychological health, regardless of student sex, student gender identity, or power dynamics within the relationship. Confidence in these findings is increased by the strong statistical power of the analyses and the strong methods. These methods included a direct statistical test of moderation that was not applied in much of the previous research on sex differences in the importance of the relational dimensions of relationships to psychological health. For example, Frey et al. (2004, 2006) simply completed separate regressions for each sex, which does not directly test the significance of moderation. Further, the strong methods in the current study included the use of a continuous validated measure of the relational dimensions of relationships (i.e., the Relational Health Indices), which has greater

statistical power than other measures used in previous research on sex differences (Neff et al., 2006; Neff & Harter, 2002).

The findings of non-significant sex differences in the correlation between the relational dimensions of faculty-graduate student mentoring and student psychological health contradict cultural feminist perspectives that purport that relationships are more important to women's psychological health (e.g., Jordan et al., 1991). In short, the results are consistent with Neff et al.'s (2006; Neff & Harter, 2002) findings in the partner relationship domain. Neff et al. (2006; Neff & Harter, 2002) found significantly better psychological health (e.g., in terms of greater self-worth and lower depression) in adults reporting a mutual relationship with one's partner (i.e., balancing autonomy and connection in decision-making, need prioritization, sensitivity to feelings, boundaries, and preoccupation with the relationship), regardless of participant sex. However, it should be noted that this study only examined the relational dimensions of mentoring. Thus, the current results should not be interpreted to mean that there are no possible sex differences in the functions and importance of mentoring relationships. For example, women may have a particular need to have career and personal success modelled for them by other women (Gilbert & Rossman, 1992). This issue was not addressed in the current study.

It was predicted that the correlation between relational mentoring and student psychological health would be moderated by gender identity and power dynamics. These predictions were built on two arguments. First, relational-cultural theory predicted sex would moderate correlations between the relational dimensions of relationships and psychological health (e.g., Jordan et al., 1991). Second, critics of cultural feminist

perspectives (like relational-cultural theory) predicted variability in terms of gender identity (e.g., masculine/feminine traits) and power explained observed sex differences (e.g., LaFrance & Henley, 1994; Unger, 1979). This study failed to demonstrate sex differences. Thus, it is logical that moderation on the basis of gender identity and power dynamics were also not observed. Gender identity and power may help to explain other situations in which there are observed sex differences. Therefore, the current results may not actually contradict those critiques of cultural feminism (e.g., LaFrance & Henley, 1994; Unger, 1979). Further, power cannot be entirely ruled out as a potential moderator in this case because only students were sampled. The subtle power dynamics of each student's individual relationship with their mentor were examined as a variable that may moderate the correlation between the relational dynamics of mentoring and student psychological health. However, it remains to be seen whether the relative power position of mentors versus students moderates the association between relational mentoring and mentor versus student psychological health. Future research can address this issue by examining the relational dynamics of mentoring from the perspectives of both mentors and students, and correlating these perceptions to mentor and student psychological health. This research could also be strengthened with a longitudinal design.

The correlation between graduate student perceptions of faculty mentor harsh social power and student psychological health. The power dynamics of the faculty-graduate student mentoring relationship were measured to serve as moderators of the correlation between relational mentoring and student psychological health. Therefore, hypotheses were formed regarding power as a moderator rather than power as a predictor of psychological health. However, the results revealed that the strongest

predictor of student psychological health in the current study was students' perceptions of faculty mentor harsh social power. In particular, graduate students reporting their faculty mentors were influencing them through harsh social power (e.g., personal and impersonal coercive power) reported poorer psychological health in terms of more depressive symptoms, lower self-esteem, and lower life satisfaction. The negative impact of faculty mentor harsh social power is consistent with previous research by Aguinis, Nesler, Quigley, Lee, and Tedeschi (1996), who examined the impacts of power usage by faculty supervisors of graduate students with research and teaching assistantships. In particular, Aguinis et al. found a significant correlation between supervisors' use of coercive power (which is part of harsh power in the current study) and students' perceptions of poor relationship quality, and low supervisor trustworthiness and credibility. Further, coercive power was associated with lower student intentions to invite the supervisor to chair or serve on their dissertation committee (Aguinis et al., 1996). The current results suggest the impacts of faculty harsh social power extend beyond student perceptions and intentions regarding the relationship and may specifically impact student psychological health. Further, the finding that harsh power but not soft power (e.g., expert, informational power) was predictive of psychological health suggests that the negative aspects of the mentoring relationship may have a stronger effect on protégé outcomes, which is consistent with the conclusions of Eby, Butts, Durley and Ragins (2010) in their research on mentoring in the workplace.

The correlation between mentor harsh social power and poor student psychological health generally supports relational-cultural theory (e.g., Jordan et al., 1991). Although she was not using the language of harsh versus soft social power,

Jordan (2003) discussed the impact of a negative, coercive type of power on the psychological health of the less powerful in a relationship:

When a more powerful person empathically fails a less powerful person and the less powerful person cannot represent her experience in that relationship, she will begin to keep those aspects of herself out of the relationship. In other words, she will begin to engage inauthentically or partially. She will begin to twist herself to “fit in” with what the more powerful person wants or needs her to be. She develops strategies of disconnection, and in some cases these become strategies of survival. That is, when the non-responsiveness of the more powerful person turns into more violating or humiliating responses (e.g., emotional, physical, or sexual abuse), the child (or less powerful person) may feel endangered, certainly is not free to protest or represent her experience authentically, and she will move into traumatic disconnections or dissociation. (p. 23)

These described effects are then contrasted with the positive psychological impacts of growth-fostering connections of mutual authenticity, empowerment and engagement (Jordan, 2003). This helps to explain the negative correlation found between mentor harsh social power and RHI-M scores discussed in the previous descriptive statistics section.

Practical Implications

There are important practical implications of the two correlations revealed in this study (i.e., the correlation between relational mentoring and psychological health, and the correlation between mentor harsh social power and psychological health). Both findings support overall recommendations to examine the particular qualities of mentoring

relationships and not assume all mentoring relationships are created equal in their effects (Johnson, 2007). In particular, the current results suggest the power dynamics of mentoring may be especially important to psychological health outcomes and should be considered in research. In addition, an important practical implication of these findings includes a suggestion that students consider the relational abilities of mentors and mentors' approaches to power specifically when selecting faculty advisors and potential mentors, in the interest of their own psychological health. In other words, it appears inadvisable to base one's mentor selection exclusively on other aspects of the relationship, such as career functions correlated with increased research productivity (e.g., Tenenbaum et al., 2001). Reported increases in the prevalence of mental health issues among university student populations (Clay, 2013) and the current findings regarding the relatively high prevalence of depressive symptoms among graduate students underscore the importance of students making decisions consistent with positive psychological health as they manage the stresses of school. It appears this may already be happening. The findings of Aguinis et al. (1996) suggest faculty exercise of harsh power is impacting student decisions regarding advisor and thesis committee selection. Thus, Aguinis et al. advised faculty members to reconsider their exercise of harsh power given their own need to collaborate with students in order to have productive research laboratories.

It should be remembered that there may be practical limits to how much control and choice a student has in selecting their thesis advisor. For example, students may have limited options in their choice of thesis advisor in small departments or within small fields of research more generally. This suggests that departments and faculty members

should also consider what they can do to enhance students' mentoring experiences and positively impact student psychological health. The current results support recommendations that mentoring be considered in the hiring, training and evaluation of faculty (Johnson, 2002; Johnson & Nelson, 1999). Further, these results suggest the concept of relational mentoring and constructive approaches to social power (e.g., noncoercive power) may be particularly helpful topics for discussion in training. Recent evaluations of similar training to enhance individuals' relational capacities in other relationships may help to guide these efforts (e.g., Liang, Tracy, Kenny, & Brogan, 2008).

Study Limitations and Directions for Future Research

Lack of clarity in defining mentoring and positive sampling biases (e.g., sampling successful students and/or relationships) have been key limitations to the mentoring literature (Johnson et al., 2007). Recruitment for the current study was designed to balance these two limitations. In particular, the recruitment notice explicitly identified mentoring relationships between graduate students and their thesis advisors as the focus of the study, thus avoiding the common mistake of assuming advisors were considered mentors by their students. However, the term "mentoring" was not defined for students given common definitions of mentoring have a positive valence (e.g., Johnson, 2002), which might have produced a positive selection bias in the sample (i.e., only students with positive relationships might have participated). Therefore, participants' definitions of mentoring may not have been consistent, which is a limitation of the study, but it appears the goal of reducing self-selection biases was successful given the range of participants' reported relationship satisfaction and quality. It is possible that if a more

explicit (and positive) definition of mentoring had been used, the most important findings of this study regarding the correlation between the relational dimensions and power dynamics of mentoring and students' psychological health may not have been found due to reduced variability. Further, the inclusion of validated measures of relational and power dynamics, rather than assumptions of the positive nature of the relationship, is already an improvement on much of the extant academic mentoring literature. Measuring rather than assuming mentoring relationship quality has been recommended by experts in the field (Johnson, 2007; Johnson et al., 2007).

The current study had further limitations with regards to its sample recruitment. First, a response rate could not be calculated given the complicated nature of the recruitment process and the open invitation used for students to participate in the anonymous online survey. Although an exact response rate could not be calculated, it would be reasonable to assume the response rate is relatively low (given the different avenues used for recruitment and the final sample size of 421 students). However, issues with response rates would not be unique to this study. Low response rates have been common limitations in academic mentoring research, which has relied heavily on self-report survey designs (Johnson et al., 2007). Second, graduate students completing degrees in science and the arts and social sciences were over-represented in the sample, making the generalizability of the results to under-represented groups (e.g., engineering, business students) questionable, but this is also not unique. For example, Tenenbaum et al. (2001) exclusively sampled science, social science, and humanities students, and their entire sample was even recruited from a single university. The recruitment of students

from multiple disciplines at multiple universities of variable size from different regions across Canada is a strength of this research.

The cross-sectional design of the current study was a significant limitation but again not an uncommon one. Survey designs have been common in the mentoring literature and not surprising given this is a relatively young field (Johnson et al., 2007). In particular, given this is the first study to explicitly test the impact of the relational dynamics of faculty-graduate student mentoring on graduate student psychological health, the cross-sectional design may be considered appropriate. Future longitudinal research can go further to supporting a time-ordered relationship between the relational and power dynamics of the faculty-graduate student mentoring relationship and student psychological health. Further, longitudinal research may investigate psychological health as a mediator in the relationship between the relational dynamics of mentoring and other outcomes, such as mentoring relationship termination or student drop-outs. The addition of other covariates may strengthen future research. Several covariates were examined in the current study (e.g., structural qualities of the relationship), but future research may benefit from simultaneously examining the impact of the quality of multiple relationships on student psychological outcomes (e.g., partners, peers).

Limitations regarding the operationalization of power in the current study may also be addressed in future research. The current study has only provided a partial test of power as a moderator of the association between the relational dynamics of mentoring and psychological outcomes by comparing students reporting their mentors had varying levels of power over them. Further research is needed to assess the relative power of mentor versus student roles as a moderator of the association between relational

mentoring and psychological health outcomes of each party. The finding that mentors' use of harsh power predicted students' poor psychological outcomes is limited by the fact that mentor power was measured based on students' attributions of power to their mentors. Raven et al. (1998) discussed their attributional approach to the measurement of power in the IPI as intended to more closely match the common definition of social power as the ability to change a target's behaviour. Other "objective" measures of power (e.g., whether a mentor actually has expert power based on documented expertise and abilities) may not always produce the expected effects (e.g., students may not act as requested despite the mentor's documented expertise). Future research can examine other measures of the power dynamics of the relationship, including mentor perceptions of their own social power, and these influences on student outcomes.

Conclusions

The current study has contributed novel results to the mentoring literature through both descriptive analyses and hypothesis testing using cross-sectional survey data with a large ($N = 421$) sample of Canadian graduate students. Most importantly, the current results suggest graduate students from multiple disciplines may be at elevated risk for depressive symptoms, and the relational dynamics (i.e., mutual authenticity, engagement, and empowerment) and specific power dynamics (i.e., mentor use of harsh or coercive power) of faculty-graduate student mentoring relationships are significantly correlated with student psychological health. Further, proposed sex differences in the correlation between the relational dynamics of mentoring and student psychological health (e.g., Jordan et al., 1991; Liang et al., 2002a) were explicitly tested and debunked. The study was designed to address these gaps in the literature and improve upon the methods of

other research by limiting sampling biases, using a validated measure of relational dynamics, simultaneously testing moderators informed by cultural feminist theories and their critics, and testing both positive and negative outcomes of mentoring. The current study has advanced the field with its methodological improvements and its findings, which can direct future research to further explore the particular importance of relational and power dynamics to the psychological health of mentored students (e.g., with longitudinal designs). Finally, the results can inform student selections of advisors (who may become mentors) and departmental decisions regarding faculty hiring and advancement with the goal of enhancing student psychological health.

Chapter 3: Study 2

Do Sex, Gender Identity, and Power Influence Relationship Styles in Faculty-Graduate Student Mentoring?

The survey research presented in Chapter 2 demonstrated a significant association between relational mentoring and positive student psychological health. Given these results, it may be helpful to determine who is most likely to cultivate relational mentoring. As introduced in Chapter 1, relational-cultural theory has hypothesized that women are more likely to exhibit relationship styles characterized by mutual authenticity, engagement, and empowerment (e.g., Jordan et al., 1991), but critics have argued differences on the basis of gender identity (i.e., masculine, feminine traits), and situational power may be more important (e.g., Unger, 1979; Yoder & Kahn, 1992).

Very limited research has examined sex differences in mentor relationship styles, and no research has concurrently examined the influences of sex, gender identity, and power on relationship styles within the feminist psychological literature or mentoring literature. Study 1 represented the only research to examine sex differences in relational mentoring specifically, but its supplementary analyses on sex differences in the degree of relational mentoring between graduate students and thesis advisors failed to differentiate between the contributions of each party (instead measuring overall relational mentoring quality). The relationship styles of both faculty mentors and student protégés are of interest given discussions of the potential for both mentors and protégés to contribute to the quality of mentoring (e.g., Johnson, 2014; Johnson & Huwe, 2002). Given the over-reliance on survey research in the mentoring literature (e.g., Johnson et al., 2007), an experimental design was chosen to isolate the effects of the independent variables.

Although sex and gender identity could only be measured, an experimental manipulation of power through assigned roles as faculty mentor or student was used. The research design was inspired by the experimental methods of researchers examining the effects of sex versus power in other areas, such as non-verbal sensitivity and influence strategies (e.g., Sagrestano, 1992; Snodgrass, 1985). The following three hypotheses were tested in the current study:

Hypothesis 1: There will be a significant conditional effect of sex on relationship style. Specifically, women are predicted to adopt a relationship style characterized by greater authenticity, engagement, and empowerment, in comparison to men.

Hypothesis 2: There will be a significant conditional effect of gender identity on relationship style. Specifically, individuals with more feminine traits are predicted to adopt a relationship style characterized by greater authenticity, engagement, and empowerment, in comparison to individuals with fewer feminine traits.

Hypothesis 3: There will be a significant conditional effect of power on relationship style. Specifically, individuals assigned to a low-power student role are predicted to adopt a relationship style characterized by greater authenticity, engagement, and empowerment, in comparison to individuals assigned to a high-power faculty mentor role.

Pilot Study 1 Method

Participants

Fifteen male and fifteen female undergraduate students participated in a pilot study designed to: 1) test an experimental power manipulation; and 2) assess the properties of two dependent measures of relationship style. Participants were students in first- and second-year psychology courses who voluntarily signed up for the pilot study to receive course credit through the Psychology Department's online participant recruitment system. Participants identified themselves as Caucasian (50.0%; $n = 15$), African or African Canadian (10.0%; $n = 3$), Chinese (10.0%; $n = 3$), Arab or West Asian (6.7%; $n = 2$), South Asian (3.3%; $n = 1$), South East Asian (3.3%; $n = 1$), or other ancestry (16.7%; $n = 5$). Participants' reported ages ranged from 18 to 42 years ($M = 22.97$; $SD = 5.28$). Participants identified themselves as students in academic programs in the faculties of arts and social science (48.1%; $n = 13$), science (29.6%; $n = 8$), public affairs (7.4%; $n = 2$), and business (3.7%; $n = 1$), and three students (11.1%) reported enrollment in programs from more than one faculty.

Materials

Power manipulation. Previous experimental research has investigated sex and power differences in interpersonal sensitivity using a teacher-student paradigm (Snodgrass, 1985). In the current study, a faculty mentor-student paradigm was used to manipulate power to test sex, gender identity, and power differences in relationship style. Participants were randomly assigned to one of two conditions. They were asked to imagine themselves acting as either a professor supervising a student research project or a student completing research under the supervision of a professor (see Appendix L for the

100- to 150-word description of each role that participants were asked to read). The professor and student role descriptions were based on three sources of information: 1) Carleton University Faculty of Graduate and Postdoctoral Affairs (n.d.) guidelines on the roles and responsibilities of thesis supervisors and graduate students, 2) research literature on mentoring functions (Kram, 1983), and 3) social psychological literature on social power (Raven, Schwarzwald, & Koslowsky, 1998). For example, the professor description included mentoring functions such as providing advice, guidance and coaching (e.g., providing feedback on student work to develop his/her skills). The professor description also included aspects of social power, such as impersonal reward or coercive power (e.g., providing or not providing letters of reference for the student). The student description was written to essentially provide a mirror image of the professor description in terms of the power dynamics of the relationship.

Power manipulation check. Participants indicated their understanding of the relative power of their position as either a faculty mentor or student through a single-item measure adapted from a previous social psychological study on power (Haines & Kray, 2005). Participants in the faculty mentor condition answered the question, “To what extent do you feel that your role as a thesis supervisor and the student’s role are equally balanced in terms of power? Please answer this on a scale from 0 to 100 where 0 indicates the student has more power, 50 indicates you both have equal power, and 100 indicates you have more power as a thesis supervisor.” Participants in the student condition answered the question, “To what extent do you feel that your role as a student and your thesis supervisor’s role are equally balanced in terms of power? Please answer this on a scale from 0 to 100 where 0 indicates your thesis supervisor has more power, 50

indicates you both have equal power, and 100 indicates you have more power as a student” (see Appendix M).

Demographics. Participants provided the following demographic information: sex, age, ethnicity, and academic program (see Appendix N).

Gender identity. Participants completed the Masculinity and Femininity subscales of the Personal Attributes Questionnaire (PAQ-M and PAQ-F; Spence & Helmreich, 1978). Each subscale had 8 items scored from 0 (“not at all like me”) to 4 (“very much like me”); total scores could range from 0 to 32 with higher scores indicating higher identification with masculine and feminine traits, respectively. Sample items include “independent” for masculine, and “warm” for feminine (please see Appendix E for full measure used). Only femininity scores were used in the primary analyses given that relational-cultural theory posits that women who are socialized to be feminine are more relational (Jordan et al., 1991).⁸ The femininity subscale has demonstrated adequate internal consistency in previous research (e.g., $\alpha = .75$, Burnett, Anderson, & Heppner, 1995; $\alpha = .72$ to $.80$ across six samples, Helmreich, Spence, & Wilhelm, 1981), and in Study 1 ($\alpha = 0.79$). Factor analyses with the PAQ-M and PAQ-F subscales have supported the PAQ’s construct validity by confirming the presence of two factors: masculinity and femininity (average factor loading = $.53$ for femininity items loading on the femininity factor across six samples; Helmreich et al., 1981). The strong convergent validity of the femininity scale has been demonstrated in multiple studies with correlations between PAQ-F scores and another popular measure of femininity (i.e., the femininity subscale of the Bem Sex Role Inventory; Bem, 1974) ranging from $.52$ to $.71$

⁸ However, as will be discussed, both masculinity and femininity scores were considered in follow-up analyses.

(see Spence, 1991, for a review). Women have also scored significantly higher than males on the PAQ-Femininity scale in previous research (e.g., English-speaking male versus female university administrators, $t(635) = 2.05, p = .02$, 1-tailed, Hill, Fekken, & Bond, 2000; female college student $M = 24.37, SD = 3.68$, male college student $M = 22.43, SD = 3.73, p < .01$, Spence & Helmreich, 1978), and in Study 1 (female $M = 24.33, SD = 4.41$, male $M = 22.38, SD = 5.31, t(217.55) = -3.64, p < .001$, 2-tailed).

Relationship style. Relationship style was measured in two ways: 1) a self-report measure of relationship style; and 2) an indirect measure of relationship style through a recall task. Participants completed a minimally modified version of the Mutual Psychological Development Questionnaire (MPDQ; Genero, Miller, Surrey, & Baldwin, 1992; see Appendix O). The MPDQ includes 22 items that assess relationship quality within a dyad based on the characteristics of growth-fostering relationships in relational-cultural theory (e.g., mutual authenticity, empowerment, and engagement; Jordan et al., 1991). Eleven items assess one's own relationship style in terms of authenticity, engagement and empowerment. Sample items include "Be receptive," and "Try to understand." The remaining eleven items assess one's perceptions of the other party's relationship style in terms of authenticity, engagement and empowerment. Sample items include "Pick up on feelings," and "Show an interest." The two subsets of items are designed to have equivalent content (albeit with different wording) and measure the same underlying relationship style for two individuals. Items are scored on a Likert scale from 1 ("never") to 6 ("all the time"). An average score is then calculated based on the full 22 items after reverse scoring requisite items. Higher average scores reflect a relationship characterized by greater *mutual* authenticity, engagement and empowerment based on the

combined relationship styles of the two parties to the relationship. Importantly, participants were specifically instructed to rate each item based exclusively on their *own intended* relationship style within their assigned role as either a faculty mentor or student rather than based on their previous relationship styles in existing relationships or their perceptions of others' relationship styles. Measures of behavioural intentions have also been used in experimental research on sex differences in self-construals (Gabriel & Gardner, 1999) and in experimental research on sex versus power differences in influence strategies (Sagrestano, 1992).

Previous research has demonstrated the MPDQ has high internal reliability (alpha coefficients ranging from .87 to .93 across ratings of friend and partner relationships, Genero et al., 1992; alpha coefficients ranging from .91 to .94 across mother, father, and partner relationships, Sanftner et al., 2006). Test-retest reliability estimates over a two-week period also range from .71 to .84 (Genero et al., 1992). Multiple studies have also demonstrated the MPDQ's strong convergent validity (e.g., across ratings of friend and partner relationships r 's = .24 to .43, $p < .001$, with social support, r 's = -.19 to -.36, $p < .001$, with depression, Genero et al., 1992; relationships with mothers r 's = -.17 and -.14, $p < .01$, with bulimia and body dissatisfaction, respectively, Sanftner et al., 2006).

Participants completed a recall task for the second measure of relationship style. The use of recall of another party's personal details as an indication of a more connected relationship style was inspired by the experimental research of Gabriel and Gardner (1999), who found evidence of sex differences in self-construals based on women's recall of more relational information (i.e., relating to small-scale, intimate interactions) from diary entries presented as stimuli. Accompanying the description of faculty mentor and

student roles provided in the power manipulation was a description of an individual with whom each participant was instructed to imagine interacting (see Appendix L). If a participant was assigned the student role, he/she read a description of a professor with whom he/she would interact. If a participant was assigned the faculty mentor role, he/she read a description of a student with whom he/she would interact. The same description was provided for each role (i.e., only the role varied) and the descriptions were written in sex-neutral language. Participants were later asked to recall details from the description of the other party to the imagined interaction and list these details in response to an open-ended question (see Appendix P). Responses were coded based on the number of correct personal and impersonal details recalled (see Appendix Q for a detailed coding scheme). Two undergraduate student volunteers in the research laboratory coded the entire sample of responses independently to allow for an examination of inter-rater reliability. A ratio was then calculated based on the number of personal details correctly recalled compared to the overall number of correctly recalled details. A ratio was calculated rather than a total to correct for individual differences in memory and to isolate the relative amount of attention paid to personal versus impersonal details.

Procedures

Upon receiving clearance from the Carleton University Psychology Research Ethics Board, participants were recruited through the Psychology Department's online recruitment system, SONA. A recruitment notice was posted on the online portal and students in first- and second-year psychology courses were able to sign up to participate to increase course marks (see Appendix R). Timeslots were made available for male and female participants separately to allow for targeted recruitment of either group in the

event that one group was participating less frequently (e.g., if more females than males were participating, the next set of timeslots would be allocated for males specifically to try to balance the two groups, and strengthen the power of statistical analyses). The pilot study was completed in an on-campus research laboratory, which accommodated up to two participants at a time. However, participants viewed and completed study materials independently during the experiment and did not interact with other participants.

Participants were randomly assigned to one of two power conditions (i.e., faculty mentor or student researcher) prior to the start of the experiment. Sixteen participants were assigned to the faculty mentor condition and fourteen were assigned to the student condition. After providing informed consent (see Appendix S), participants read a description of their role as either a faculty mentor or student (the power manipulation described above). At this time, participants also read the description of their dyad partner (i.e., faculty mentor or student) required for a later recall task (one of two measures of relationship style described above). These materials were then removed so participants could not refer to them during the later recall task. Participants then completed the measures of demographics, gender identity, and MPDQ (the second measure of relationship style) in a counterbalanced order. Finally, participants completed the recall task and power manipulation check. Upon completion, the participants were fully debriefed (see Appendix T) and received an increase of 0.5% to their psychology course mark for their involvement in the half-hour study.

Pilot Study 1 Results and Brief Discussion

Missing Values

A minimal amount of data was missing in this experiment. One participant was missing two items from the PAQ and one item from the MPDQ, and one participant did not complete the power manipulation check. Given the low amount of missing data and the preliminary, limited nature of the analyses for Pilot Study 1, analyses were completed without the one participant missing the MPDQ item and without the one participant missing the power manipulation check.

Power Manipulation Check

Participants in the faculty mentor condition perceived their power to be greater than those of participants in the student condition (faculty mentor $M = 58.94$, $SD = 17.68$; student $M = 48.57$, $SD = 21.96$). However, after screening for normality and homogeneity of variance, an independent-samples t -test failed to detect a significant difference in the perceived power of participants assigned to faculty mentor and student conditions ($t(28) = 1.43$, $p = .163$, 2-tailed). These results may have indicated problems with the power manipulation itself or the power manipulation check.

Properties of Relationship Style Measures

The modified MPDQ demonstrated high internal consistency in the pilot study (Cronbach's $\alpha = .91$), and scores ranged from 2.86 to 5.68 ($M = 4.91$; $SD = 0.55$). The coding scheme for the recall task also demonstrated adequate inter-rater reliability for calculating totals for correct personal and correct impersonal items recalled (intraclass correlation coefficients = .92 and .88, respectively). Any disagreements between coders were resolved before calculating final totals, which were then used to calculate the

proportion of correct personal items recalled out of the total correct items recalled.

Proportions ranged from 0.20 to 1.00 ($M = 0.63$; $SD = 0.20$). An unexpected significant negative correlation was found between the two measures of relationship quality ($r = -.37$, $p = .045$). These results may have indicated problems with either measure of relationship quality. However, given evidence of the construct validity of the MPDQ as a measure of relationship styles characterized by authenticity, engagement, and empowerment (e.g., Genero et al., 1992), it was likely that problems with the exploratory recall measure of relationship style were contributing to these results.

Associations with Relationship Style

A moderated multiple regression was completed to explore the associations between relationship style and the three predictors (i.e., sex, power, femininity) and their interactions in the pilot experiment. Given the results of the reliability analyses above, modified MPDQ scores served as the only dependent variable. Both power and sex were dummy coded (i.e., faculty mentor = 0, student = 1; male = 0, female = 1), and femininity scores were standardized, as recommended in moderated regression analyses (Aguinis, 2004). After bringing one outlying modified MPDQ score within range (i.e., a score of 2.86 was changed to 3.14), the data were found to meet the requisite assumptions of the analyses. Regressions were then completed with the three independent variables entered in the first step of a hierarchical regression, and with all two-way and three-way interactions entered in the second step. Model 1's squared multiple correlation coefficient indicated that 32.1% of the variability in modified MPDQ scores was accounted for by the combined effects of participant sex, power, and femininity. However, as seen in Table 3.1, only femininity scores were significantly associated with

relationship style. Specifically, an increase in femininity scores of one standard deviation was associated with an increase in modified MPDQ scores of 0.25 points. The change in the squared multiple correlation associated with Model 2 was not significant ($p = .988$) and indicated that the interactions between the independent variables accounted for an additional 1% of the variability in modified MPDQ scores. No individual regression coefficients were significant in Model 2. These overall results should be interpreted with caution, however, given the small sample size and reduced statistical power involved in these analyses.

Table 3.1

Moderated Multiple Regression: Pilot Study 1 Relationship Style on Sex, Femininity, and Power and Interaction Effects

Model	Predictor	<i>B</i>	<i>SE B</i>	β	<i>p</i>
1	Power	-0.31	0.17	-0.30	.086
	Sex	0.15	0.18	0.15	.394
	Femininity	0.25	0.09	0.48	.014
2	Power	-0.28	0.31	-0.27	.383
	Sex	0.18	0.30	0.17	.565
	Femininity	0.21	0.27	0.41	.443
	Sex x Power	0.02	0.42	0.02	.967
	Femininity x Power	0.09	0.33	0.12	.786
	Sex x Femininity	0.07	0.32	0.10	.829
	Sex x Power x Femininity	-0.21	0.43	-0.20	.623
	Sex x Power x Femininity				
	Sex x Power x Femininity				
	Sex x Power x Femininity				

Model 1 $R^2 = 0.32, p = .017$

Model 2 $\Delta R^2 = 0.01, p = .988$

Note. Relationship style was measured with a modified Mutual Psychological Development Questionnaire (MPDQ), representing authenticity, engagement, and empowerment. Power was operationalized through random assignment to one of two

conditions (0 = faculty mentor/high-power; 1 = student/low-power). Sex was dummy coded (0 = male; 1 = female). Femininity was measured through the Personal Attributes Questionnaire – Femininity.

Additionally, an internal analysis was completed due to the non-significant results of the power manipulation check. Thus, the above moderated multiple regression was re-run with power manipulation check scores entered as an independent variable rather than the categorical power condition. Power manipulation check scores were standardized and data screening indicated the assumptions of moderated multiple regression were met. Model 1's squared multiple correlation coefficient indicated that 27.5% of the variability in modified MPDQ scores was accounted for by the combined effects of participant sex, power manipulation check scores, and femininity. However, again, only femininity scores were significantly associated with modified MPDQ scores (see Table 3.2). An increase of one standard deviation in femininity scores was associated with an increase in modified MPDQ scores of 0.21 points. The change in the squared multiple correlation associated with Model 2 was not significant ($p = .349$) but indicated that the interactions between the independent variables accounted for an additional 12.8% of the variability in modified MPDQ scores. No predictors or interactions were individually significant in Model 2. Given the small sample size and reduced statistical power of these analyses, however, these results should be interpreted with caution.

Table 3.2

Moderated Multiple Regression: Pilot Study 1 Relationship Style on Sex, Femininity, and Power Manipulation Check Scores and Interaction Effects

Model	Predictor	<i>B</i>	<i>SE B</i>	β	<i>p</i>
1	Power Check	0.11	0.09	0.20	.257
	Sex	0.12	0.19	0.12	.528
	Femininity	0.21	0.09	0.40	.035
2	Power Check	0.25	0.13	0.48	.064
	Sex	0.32	0.21	0.31	.146
	Femininity	0.12	0.14	0.23	.411
	Sex x Power Check	-0.36	0.21	-0.42	.108
	Femininity x Power Check	0.19	0.15	0.34	.218
	Sex x Femininity	-0.03	0.21	-0.04	.896
	Sex x Femininity x Power Check	0.03	0.22	0.04	.880

Model 1 $R^2 = 0.28, p = .036$

Model 2 $\Delta R^2 = 0.13, p = .349$

Note. Relationship style was measured with a modified Mutual Psychological Development Questionnaire (MPDQ), representing authenticity, engagement, and

empowerment. Power manipulation check was operationalized through participant ratings of the power of their randomly assigned position (either faculty mentor or student researcher) in the experiment on a scale from 0 (low power) to 100 (high power). Sex was dummy coded (0 = male; 1 = female). Femininity was measured through the Personal Attributes Questionnaire – Femininity.

Pilot Study 2 Introduction

Although the results of preliminary moderated multiple regressions of Pilot Study 1 data indicated the study design showed promise, the non-significant results of the power manipulation check indicated that there were potential issues with the power manipulation and/or power manipulation check in the experiment. Further, analyses of the relationship style measures indicated that the modified Mutual Psychological Development Questionnaire (Genero et al., 1992) was reliable, but the recall task was not. Thus, Pilot Study 2 proceeded with the purpose of improving upon the power manipulation and power manipulation check, and developing another measure of relationship style.

Pilot Study 2 Method

Participants

Thirty-two student participants (14 males and 18 females) from first- and second-year undergraduate psychology courses were recruited from the SONA online recruitment system. The objective of Pilot Study 2 was twofold: 1) test an improved experimental power manipulation; and 2) assess the properties of a newly-added dependent measure of relationship style. The participants identified themselves as

Caucasian (34.4%; $n = 11$), African or African Canadian (28.1%; $n = 9$), Arab or West Asian (12.5%; $n = 4$), Chinese (6.3%; $n = 2$), South Asian (6.3%; $n = 2$), and other ancestry (12.5%; $n = 4$). Participant ages ranged from 17 to 30 years ($M = 19.91$; $SD = 3.15$). Participants were enrolled in programs in the faculties of arts and social sciences (40%; $n = 12$), science (30%; $n = 9$), business (16.7%; $n = 5$), public affairs (10%; $n = 3$), and engineering and design (3.3%; $n = 1$).

Materials

Power manipulation. Given the results of Pilot Study 1, the power manipulation was altered to elaborate on the roles and use stronger wording to emphasize the differences in power between the faculty mentor and student conditions. The new role descriptions were between 250 and 300 words (see Appendix U). Again, the student description was written to essentially provide a mirror image of the professor description in terms of the power dynamics of the relationship. The stronger descriptions were based on four sources of information: 1) Carleton University guidelines regarding thesis supervisor-student relationships (Carleton University Faculty of Graduate and Post-doctoral Affairs, n.d.), 2) research literature on mentoring functions (Kram, 1983), 3) social psychological literature on social power (Raven et al., 1998), and 4) personal knowledge of some of the experiences of students completing research under the supervision of faculty developed through informal conversations with peers and formal interviews completed previously as part of a qualitative research methods course.

Power manipulation check. Given the non-significant difference between power ratings of the two power conditions in Pilot Study 1 may have been due to the manipulation check as well, a new manipulation check was tested in Pilot Study 2. A

power measure was selected from previous research on sex and power differences in relationship styles (Neff & Harter, 2002). Participants rated the overall power associated with their position from 1 to 5 with higher scores indicating lower power. Each point on the five-point scale was associated with a written statement of the power differential (e.g., “I definitely have the most power in the relationship”) and a visual representation of the power differential (see Appendix W). The statements and visual representations were altered from those of Neff and Harter (2002) to fit the faculty mentor-student relationship rather than the romantic partnership represented in the original scale, and the statements were simplified to explicitly discuss power rather than a lengthier statement on decision-making and being “in charge.”

Demographics. Participants provided the same demographic information as in Pilot Study 1.

Gender identity. As in Pilot Study 1, participants completed the Personal Attributes Questionnaire (PAQ; Spence & Helmreich, 1978).

Relationship style. Relationship style was measured using two self-report measures of relationship style. Participants completed the minimally modified Mutual Psychological Development Questionnaire (MPDQ; Genero et al., 1992) given the adequate psychometric properties of the scale demonstrated in Pilot Study 1. However, the poor performance of the recall task in Pilot Study 1 led to its replacement in Pilot Study 2 with an additional self-report measure of relationship style inspired by Neff and Harter’s (2002) measure of relationship style, which like the MPDQ, was informed by relational-cultural theory (e.g., Jordan et al., 1991). Neff and Harter assessed participants’ choices of one of three cameos describing their overall relationship style in

the context of their romantic partnerships, but the use of such a coarse measure limits the variability of participants' responses and therefore the power of analyses with the data. Therefore, a new measure was developed for Pilot Study 2 that basically converted Neff and Harter's (2002) relationship style cameos into a continuous measure of intended relationship style for mentoring relationships (Relationship Style Scenarios; see Appendix W). Specifically, six items were created to reflect the six dimensions of relationship style included in the original cameos: 1) decision-making style; 2) needs met; 3) empathy; 4) clarity; 5) boundaries; and 6) relationship concern. The wording of the items indicated behavioural intentions were measured rather than self-reported actual behaviour to fit the current experiment. Each item presented participants with a new scenario in a mentoring relationship and instructed them to choose one of three options for their response in that scenario. Each option reflected a relationship style of self-focused autonomy, mutuality or other-focused connection, which are the three styles assessed in Neff and Harter's (2002) cameos. Total scores were calculated to represent overall relationship style. Scores ranged from 6 to 18 with higher scores indicating other-focused connection and lower scores indicating self-focused autonomy.

Procedures

Following approval from the Carleton University Psychology Research Ethics Board, the procedures from Pilot Study 1 were followed with two exceptions. First, in Pilot Study 2, an even number of participants had been randomly assigned to each power condition (i.e., sixteen each). Second, the role descriptions provided to participants at the beginning of the experiment no longer had to be collected immediately after being read given a recall task was no longer being used to measure relationship style. It should also

be noted that references to the recall task in the debriefing were removed (see Appendix X).

Pilot Study 2 Results and Brief Discussion

Missing Values

A minimal amount of data was missing in this experiment. One participant was missing one item from the PAQ, one participant did not complete the new Relationship Style Scenarios, and one participant did not complete the power manipulation check. Given the low amount of missing data and the preliminary, limited nature of the analyses for Pilot Study 2, analyses were completed without the one participant missing the new Relationship Style Scenarios and without the one participant missing the manipulation check.

Power Manipulation Check

Participants in the faculty mentor condition reported lower power scores than participants in the student condition, indicating that participants recognized the relatively higher power of the faculty mentor role (note that lower scores on the five-point power scale indicated higher power; faculty mentor $M = 2.06$, $SD = 0.44$; student $M = 4.07$, $SD = 0.88$). Power ratings were normally distributed for participants in both the faculty mentor and student conditions, but variances were significantly heterogeneous ($F = 4.70$, $p = .038$). Consequently, degrees of freedom were reduced in the t -test by applying the Welch-Satterthwaite solution (Howell, 2013). The subsequent t -test demonstrated the observed difference in power ratings between the faculty mentor and student conditions was significant ($t(20.31) = -7.90$, $p < .001$, two-tailed). These results indicated a successful power manipulation that could be used in the full experiment.

Properties of Relationship Style Measures

As in Pilot Study 1, the minimally modified MPDQ demonstrated high internal consistency in the current study (Cronbach's $\alpha = .84$), and scores ranged from 3.23 to 5.64 ($M = 4.60$; $SD = 0.50$). The new Relationship Style Scenarios scale was not found to be internally reliable ($\alpha = .21$), and scores ranged from 8 to 14 ($M = 11.16$; $SD = 1.55$). The two measures of relationship quality were not significantly correlated ($r = .03$, $p = .867$). Given the low internal reliability of the new Relationship Style Scenarios, it was likely that problems with this measure contributed to the non-significant correlation with the modified MPDQ. Thus, the full experiment proceeded using the MPDQ as its sole dependent measure of relationship style.

Full Experiment Method

Participants

A sample of 186 students (46 males and 140 females) in first- and second-year undergraduate psychology courses participated in an online version of the current experiment.⁹ The original sample included 190 participants but four participants were removed from the dataset because they did not provide any data. Participants were recruited through the Psychology Department's online portal, SONA, as they were in Pilot Studies 1 and 2. Participants identified themselves as Caucasian (63.4%; $n = 118$), Arab/West Asian (10.2%; $n = 19$), Chinese (5.9%; $n = 11$), South Asian (4.3%; $n = 8$), African or African Canadian (2.7%; $n = 5$), South East Asian (1.6%; $n = 3$), or other ancestry (11.8%; $n = 22$). Participant ages ranged from 18 to 50 years ($M = 21.42$; $SD =$

⁹ Although the pilot experiment was conducted in-lab, the full experiment was completed through online surveys given a significant decline in responses to advertisements for the in-lab experiment (likely due to the convenience of online research for participants and the prevalence of online research being conducted by others using the same participant pool in the department).

4.64). Participants indicated they were enrolled in programs in the faculties of arts and social sciences (53.0%; $n = 96$), science (17.7%; $n = 32$), public affairs (17.1%; $n = 31$), business (8.8%; $n = 16$), engineering and design (1.7%; $n = 3$), and programs from multiple faculties (1.7%; $n = 3$). Five participants either did not indicate their program or indicated they were undeclared at the time of the study.

Materials

Power manipulation. The same materials (i.e., faculty mentor and student role descriptions) were used to manipulate power in this experiment as in Pilot Study 2.

Power manipulation check. The same measure that was used in Pilot Study 2 was used to assess participants' perceptions of the power of their randomly assigned positions.

Demographics. Participants provided the same demographic information as in Pilot Studies 1 and 2.

Gender identity. As in Pilot Studies 1 and 2, participants completed the Personal Attributes Questionnaire (PAQ; Spence & Helmreich, 1978). The internal consistency of the Femininity subscale was confirmed in the current sample ($\alpha = .80$). Female participants reported significantly more feminine traits than males (female $M = 24.68$, $SD = 4.23$; male $M = 22.13$, $SD = 4.75$; $t(184) = -3.44$, $p = .001$, 2-tailed).¹⁰

Relationship style. Given the results of Pilot Study 2, only the minimally modified Mutual Psychological Development Questionnaire (MPDQ; Genero et al., 1992) was used to measure participants' relationship styles. The internal consistency of the modified measure was again confirmed in the current sample ($\alpha = .90$).

¹⁰ Data were screened for normality and homogeneity of variance prior to the independent-samples t -test.

Procedures

Following approval from the Carleton University Psychology Research Ethics Board, the same procedures were used in the full experiment as were tested in Pilot Study 2, with the exception that materials were presented and data were collected through a website. Participants were recruited through the Psychology Department's online recruitment system, SONA, as before, but this time participants were provided with the address of a website associated with the study at the time that they signed up. Upon visiting the site, participants were instructed to e-mail the researcher for the web address for the online survey (www.fluidsurveys.com). Participants who followed these instructions were forwarded the web address for the survey associated with their randomly assigned experimental condition (i.e., faculty mentor or student with materials presented in counterbalanced orders). Ninety participants were randomly assigned to the faculty mentor condition and 96 were assigned to the student condition. Informed consent was provided through clicking a button on the website before proceeding to the first page of the survey. Participants were fully debriefed and received course credit for their involvement in the study. Given data collection occurred online, participants received an increase to their psychology course marks of only 0.25% for their half-hour participation (half of what was provided to participants in the in-lab experiment), as per departmental policy.

Results

Missing Values

Amount and pattern of missing values. Preliminary analyses were first completed to assess the amount and pattern of missing data. Screening was conducted

separately for the power manipulation check and the primary analyses for hypothesis-testing given the independence of these tests. One participant out of the sample of 186 was missing a power rating for the manipulation check. Given the small amount of missing data on this particular variable and the low likelihood imputation of this one value would impact the results of the power manipulation check, it was deemed acceptable to eliminate this participant from that specific analysis.

Regarding the variables in the primary analyses (i.e., power condition, sex, Personal Attributes Questionnaire – Femininity total score, Mutual Psychological Development Questionnaire average score), 16 out of the 186 participants (8.6%) were missing the MPDQ average score. No other data were missing. The results of a missing value analysis completed through SPSS indicated these data were likely missing completely at random (MCAR). Little's MCAR test was non-significant ($\chi^2(1) = 2.08, p = .149$), as was the *t*-test comparing mean PAQ-F scores for those with and without an MPDQ score ($t(19.2) = 1.7, p = .111$, two-tailed).

Multiple imputation procedures. Multiple imputation was used to replace the missing values and preserve the sample size, and therefore, the power of the planned moderated multiple regression. In this process, regression was used to estimate missing values based on variables entered as predictors in the model; in this case, the three independent variables in the experiment (power condition, sex, PAQ-F) and one dependent variable in the experiment (MPDQ) were entered as predictors. Random error was added to the predicted scores for the missing values through two steps – first, when a random sample was taken from existing data to identify a variable's distribution, and second, when a random sample was taken from that variable's distribution to provide the

final estimate for missing values in each iteration of the multiple imputation (Tabachnick & Fidell, 2007, p. 69). In this case, ten iterations were used given the relatively small amount of missing data (White, Royston, & Wood, 2011). Consequently, final analyses were completed with pooled estimates based on ten complete datasets. All descriptive statistics for the MPDQ average score were similar between the imputed and the original datasets (see Tables 3.3 and 3.4).

Table 3.3

Descriptive Statistics of the Distributions of Participant Scores in the Original Dataset

Variable	<i>N</i>	Mean (<i>SD</i>)	Minimum	Maximum
PAQ-F	186	24.05 (4.49)	11.00	32.00
MPDQ	170	4.52 (0.61)	2.91	5.91

Note. PAQ-F represents Personal Attributes Questionnaire – Femininity scores. MPDQ represents modified Mutual Psychological Development Questionnaire average scores measuring a relationship style of authenticity, engagement, and empowerment.

Table 3.4

Descriptive Statistics of the Distributions of Participant Scores in the Ten Complete Imputed Datasets

Variable	Mean (<i>SD</i>)	Minimum	Maximum
PAQ-F	24.05 – 24.05 (4.49 – 4.49)	11.00 – 11.00	32.00 – 32.00
MPDQ	4.49 – 4.53 (0.60 – 0.62)	2.91 – 2.91	5.91 – 5.91

Note. Sample size is constant across the ten imputed datasets ($N = 186$). Ranges are provided for the statistic(s) across the ten imputed datasets. No imputation was needed for Personal Attributes Questionnaire – Femininity scores given there were no missing data. MPDQ represents modified Mutual Psychological Development Questionnaire average scores measuring a relationship style of authenticity, engagement, and empowerment.

Power Manipulation Check

An independent samples t -test demonstrated the success of the experimental manipulation in the full experiment. Data were first assessed to ensure the assumptions of normality and homogeneity of variance were met. In the full experiment, the Central Limit Theorem dictates that the sampling distribution would be normally distributed due to the large sample size ($N = 186$) and variances were homogeneous ($F = 0.001, p = .979$). As in Pilot Study 2, participants in the faculty mentor condition rated their position as having greater power than the student position, as indicated by their lower mean scores on the power measure (faculty mentor $M = 2.13, SD = 0.69$; student $M = 3.91, SD = 0.82$). The results of the t -test revealed this difference was significant ($t(183)$

= -15.78, $p < .001$, two-tailed). Thus, it was appropriate to proceed with hypothesis-testing.

Hypothesis Testing

Moderated multiple regression (MMR) assumptions. Data were screened to ensure the assumptions of moderated multiple regression were met. All measures were deemed to be reliable with positive correlations between each item and the scale total, and alpha coefficients of .90 for the MPDQ and .80 for the femininity scale of the Personal Attributes Questionnaire (PAQ). There was an absence of multicollinearity with small correlations between predictors (maximum $r = 0.25$, between sex and femininity) and tolerances above .1 in the final regression with all ten imputed datasets. There were no univariate outliers in the data for each of the two continuous variables, the PAQ femininity scale and the MPDQ average score ($-3.29 < z < 3.29$, $p > .001$), and there were no multivariate outliers in the regression model (Cook's distance < 1 in regressions for each of the ten imputed datasets with a pooled average Cook's distance of .007). Univariate normality was found through the non-significant skew and kurtosis of the distributions of MPDQ and femininity scores ($-3.29 < z < 3.29$, $p > .001$), and multivariate normality, linearity and homoscedasticity were demonstrated through a scatterplot of standardized residuals that showed no significant patterns across standardized predicted scores. Independent errors were demonstrated given the Durbin-Watson statistic was between 1 and 3 in all regressions for the ten imputed datasets (Durbin-Watson ranged from 2.10 to 2.18 over ten datasets). Homogeneity of variance between categorical moderator-based subgroups was also assessed on the basis of sex (male/female) and power condition (faculty mentor/student). Across all ten imputed datasets, the ratio of

largest to smallest variances in MPDQ average score never reached 1.5, the level at which results of MMR would become distorted based on Monte Carlo simulations (DeShon & Alexander, 1996). Therefore, the MMR analysis proceeded.

The effects of power, sex, and femininity on relationship style. The first-order effects (power condition, sex, PAQ-F) were entered in Model 1 of the moderated multiple regression, followed by all interactions in Model 2 (sex x power, PAQ-F x power, PAQ-F x sex, and sex x PAQ-F x power). Both power and sex were dummy coded (0 = high power, 1 = low power; 0 = male, 1 = female) and PAQ-F scores were standardized prior to entering the models. Both Models 1 and 2 were significant.

The squared multiple correlation associated with Model 1 across the 10 imputed datasets indicated that between 20 and 23.8% of the variability in relationship style was accounted for by the combined conditional effects of power, sex and femininity ($p < .001$). The change in the squared multiple correlation associated with Model 2 across the 10 imputed datasets indicated that an additional 7.2 to 8.6% of the variability in relationship style was accounted for by the interactions (p 's ranging from .001 to $< .001$ across the 10 datasets). The effect size associated with the moderating effects in this regression is much larger than the 1-2% that Aguinis (2004) considered noteworthy based on effect sizes reported for moderating effects in the literature and based on research with Monte Carlo simulations. The Cohen's f^2 for Model 2 with the interactions ranged from 0.11 to 0.12 over the 10 imputed datasets, which most closely corresponds to a medium effect size (medium $f^2 = 0.15$; Cohen, 1988).

Estimates of regression coefficients were pooled over the regressions for each of the ten imputed datasets and appear in Table 3.5, along with their tests of significance.

As indicated in Table 3.5, all three conditional effects (for power, sex, and femininity) were significantly associated with relationship style. Consistent with Hypothesis 1, female participants reported an intended relationship style characterized by greater authenticity, engagement, and empowerment than male participants (represented by an increase in modified Mutual Psychological Development Questionnaire scores of 0.21 points). Consistent with Hypothesis 2, participants with more feminine traits (i.e., higher Personal Attributes Questionnaire-Femininity scores) reported an intended relationship style characterized by greater authenticity, engagement, and empowerment than participants with fewer feminine traits. Specifically, increases in femininity scores of one standard deviation were associated with increases in modified MPDQ scores of 0.21 points. Contrary to Hypothesis 3, participants assigned to the low-power student role in the experiment reported an intended relationship style characterized by less authenticity, engagement, and empowerment than participants assigned to the high-power faculty mentor role (represented by a decrease in modified MPDQ scores of 0.32 points). However, because of the significant moderating effects in Model 2, these conditional effects in Model 1 were less interpretable (and only sex was still significantly predictive once the interactions were entered in the model). In particular, it was most appropriate to interpret a significant three-way interaction (or moderated moderating effect) between power, sex, and femininity that was detected in Model 2 given that any first-order effects and two-way interactions were conditional on other variables. Therefore, tests of simple slopes were conducted to follow and interpret the significant three-way interaction.

Table 3.5

Moderated Multiple Regression (Pooled Over Ten Imputed Datasets): Relationship Style on Sex, Femininity, and Power and Interaction Effects

Model	Predictor	<i>B</i>	<i>SE B</i>	β	<i>p</i>
1	Power	-0.32	0.08	-0.28, -0.24	<.001
	Sex	0.21	0.10	0.12, 0.18	.041
	Femininity	0.21	0.04	0.32, 0.37	<.001
2	Power	0.18	0.17	0.13, 0.19	.290
	Sex	0.54	0.14	0.36, 0.42	<.001
	Femininity	0.04	0.10	0.06, 0.09	.660
	Sex x Power	-0.58	0.19	-0.51, -0.43	.002
	Femininity x Power	0.19	0.16	0.18, 0.24	.216
	Sex x Femininity	0.32	0.12	0.40, 0.46	.007
	Sex x Power x Femininity	-0.46	0.18	-0.49, -0.41	.011
	Sex x Power x Femininity				
	Power x Femininity				

Model 1 $R^2 = 0.20 - 0.24$ across 10 imputed datasets

Model 2 $\Delta R^2 = 0.07 - 0.09$ across 10 imputed datasets

Note. Ranges are provided for statistics that were not pooled across the 10 imputed datasets in the regression outputs. Relationship style was measured with a modified Mutual Psychological Development Questionnaire (MPDQ), representing authenticity,

engagement, and empowerment. Power was operationalized through random assignment to one of two conditions (0 = faculty mentor/high-power; 1 = student/low-power). Sex was dummy coded (0 = male; 1 = female). Femininity was measured through the Personal Attributes Questionnaire – Femininity.

Follow-up analyses. Simple slope analysis was completed using an online calculator developed by Preacher, Curran, and Bauer (2006). Results from the MMR were entered in the calculator, including pooled regression coefficients, squared standard errors and covariances, and four *t*-tests were produced to assess the significance of the regression coefficient for the association between power condition and relationship style (i.e., MPDQ score) for four groups – low-femininity males, high-femininity males, low-femininity females and high-femininity females. As seen in Table 3.6, the only significant slope was for high-femininity females. Specifically, the difference in relationship style between high-femininity female participants in the student and faculty mentor conditions was 0.68 points on the MPDQ average score. High-femininity female participants in the faculty mentor condition were associated with a higher MPDQ score, reflecting greater authenticity, engagement and empowerment. The association between power condition and relationship style was plotted for each of the four groups; the interaction between power condition, sex, and femininity is apparent in Figures 3.1 and 3.2.

Table 3.6

Simple Slope Analysis: Regression of Relationship Style on Power for Four Groups of Participants Based on Sex and Femininity

Group	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Low-femininity male	-0.01	0.19	-0.07	.944
High-femininity male	0.37	0.27	1.40	.164
Low-femininity female	-0.13	0.15	-0.88	.381
High-femininity female	-0.68	0.12	-5.52	<.001

Note. Analyses were completed with statistics (e.g., regression coefficients, squared standard errors) that were pooled across ten imputed datasets in an original regression that detected a significant three-way interaction between power, sex and femininity in their effects on relationship style. Relationship style was measured with a modified Mutual Psychological Development Questionnaire (MPDQ), representing authenticity, engagement, and empowerment. Power was operationalized through random assignment to one of two conditions (0 = faculty mentor/high-power; 1 = student/low-power). Sex was dummy coded (0 = male; 1 = female). Femininity was measured through the Personal Attributes Questionnaire – Femininity.

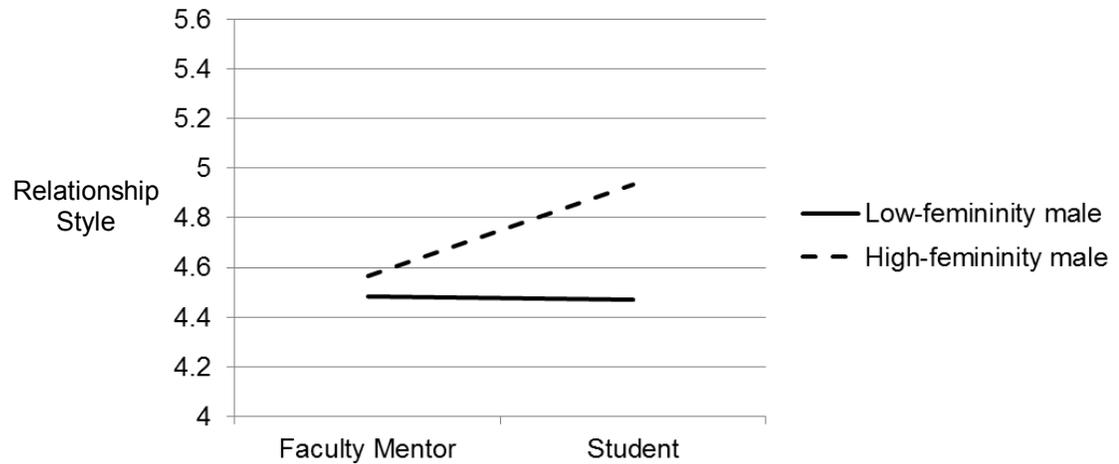


Figure 3.1. The association between assigned power condition (high-power faculty mentor versus low-power student) and relationship style scores (i.e., modified Mutual Psychological Development Questionnaire scores of authenticity, engagement, and empowerment) for male participants with high and low scores on the Personal Attributes Questionnaire-Femininity scale.

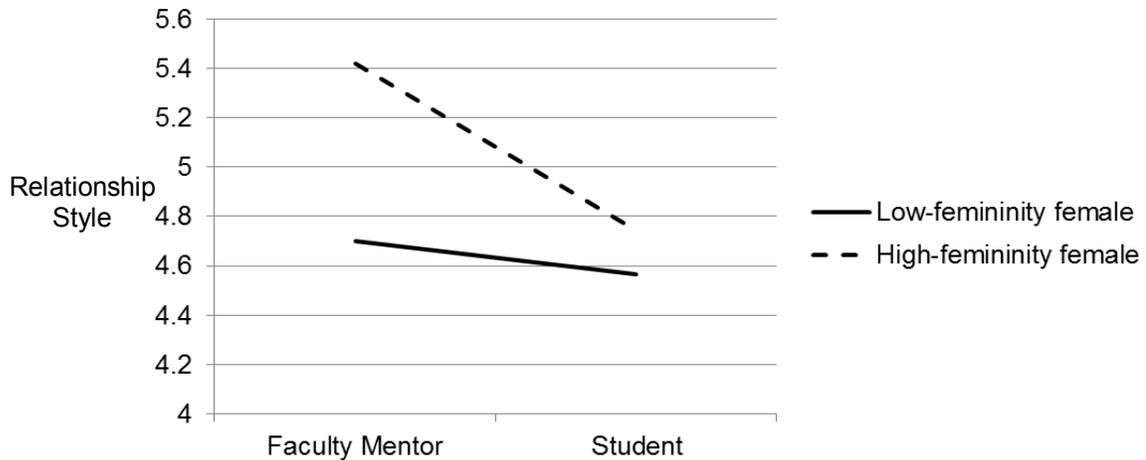


Figure 3.2. The association between assigned power condition (high-power faculty mentor versus low-power student) and relationship style scores (i.e., modified Mutual Psychological Development Questionnaire scores of authenticity, engagement, and empowerment) for female participants with high and low scores on the Personal Attributes Questionnaire-Femininity scale.

As seen in Figures 3.1 and 3.2, there was no relationship between power condition and relationship style for those scoring low in femininity. Overall, consistent with Hypothesis 2, modified MPDQ scores were low for low-femininity participants, indicating relatively low authenticity, engagement and empowerment in their intended relationship style. There was an association between power and relationship style for high-femininity participants but the direction of this association depended on sex. High-femininity males in the student (low-power) condition reported an intended relationship style characterized by greater authenticity, engagement, and empowerment than high-femininity males in the faculty mentor (high-power) condition. The opposite pattern was

observed for high-femininity female participants. Presented differently, among those with high femininity scores, sex differences in relationship style were apparent in the faculty mentor (high-power) condition (i.e., female mentors intended a more authentic, engaged, and empowering relationship style than male mentors) but no sex differences were apparent in the student (low-power) condition. Thus, there was a three-way interaction among femininity, sex, and power condition.

An analysis of variance was also completed to explore this three-way interaction. Masculinity scores were included in the analysis to further explore the finding that the sex-by-power interaction was not present among those scoring low in femininity. In particular, further analysis was needed to determine whether this low-femininity group was a high-masculinity group or whether this low-femininity group was a more undifferentiated group (i.e., scoring low on both femininity and masculinity). This has been an important distinction in other gender identity research (Spence & Helmreich, 1980; Spence, Helmreich, & Stapp, 1975). Participants were categorized into four groups based on a median split using Spence and Helmreich's (1978) normative data: 1) feminine (high femininity, low masculinity; $n = 43$), 2) masculine (low femininity, high masculinity; $n = 24$), 3) androgynous (high femininity, high masculinity; $n = 56$), and 4) undifferentiated (low femininity, low masculinity; $n = 45$). Then a $2 \times 2 \times 4$ ANOVA was completed with sex, power condition, and gender identity as factors and relationship style as the dependent variable. Data were first screened to ensure requisite assumptions were met. As discussed previously, MPDQ scores were normally distributed. Further, Levene's test indicated homogeneity of variance in MPDQ scores between groups ($F(15, 152) = 1.35, p = .179$).

As seen in Table 3.7, there were significant main effects of sex and gender identity. In particular, female participants intended a relationship style characterized by greater authenticity, engagement, and empowerment than male participants (female $M = 4.60$, $SD = 0.61$; male $M = 4.28$, $SD = 0.56$). In addition, *post hoc* pair-wise comparisons revealed that undifferentiated participants intended a relationship style characterized by significantly lower ($p < .001$) authenticity, engagement, and empowerment than feminine and androgynous participants (feminine $M = 4.69$, $SD = 0.55$; masculine $M = 4.39$, $SD = 0.59$; androgynous $M = 4.69$, $SD = 0.61$; undifferentiated $M = 4.22$, $SD = 0.56$).

A significant sex-by-power interaction was also detected such that significant sex differences were detected in the faculty mentor (high-power) condition but not in the student (low-power) condition. Specifically, female participants in the mentor condition intended a relationship style characterized by greater authenticity, engagement, and empowerment than male participants in the mentor condition (female mentor $M = 4.82$, 95% CI = 4.66 - 4.97; male mentor $M = 4.25$, 95% CI = 4.02 - 4.49). Male and female participants in the student (low-power) condition intended similar relationship styles in terms of authenticity, engagement, and empowerment (female student $M = 4.37$, 95% CI = 4.22 - 4.51; male student $M = 4.31$, 95% CI = 4.04 - 4.58). When examining the simple effect of power on relationship style for each sex, the results suggest that female participants in the mentor condition intended a relationship style characterized by significantly greater authenticity, engagement, and empowerment than female participants in the student condition, and male participants in the mentor and student conditions intended similar relationship styles (see means and confidence intervals reported above for the simple effect of sex on relationship style for each power

condition). Notably, the three-way interaction between sex, power condition, and gender identity was not significant in this analysis. Thus, the sex-by-power interaction applied to all four gender identity groups. Differentiating between the four gender identity groups, and the two low-femininity groups (i.e., masculine and undifferentiated) in particular, revealed that the overall low MPDQ scores of the undifferentiated group may account for the three-way interaction in the regression results reported previously.

Table 3.7

Analysis of Variance in Relationship Style Based on Sex, Power, and Gender Identity

Variable	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Sex	2.37	1	2.37	8.59	.004
Power	0.95	1	0.95	3.45	.065
PAQ typology	3.78	3	1.26	4.56	.004
Sex x Power	1.58	1	1.58	5.74	.018
Sex x PAQ typology	0.44	3	0.15	0.53	.664
Power x PAQ typology	1.41	3	0.47	1.71	.168
Sex x Power x PAQ typology	1.59	3	0.53	1.91	.130

Note. Relationship style was measured with a modified Mutual Psychological Development Questionnaire (MPDQ), representing authenticity, engagement, and empowerment. Power was operationalized through random assignment to one of two conditions (0 = faculty mentor/high-power; 1 = student/low-power). Sex was dummy coded (0 = male; 1 = female). Gender identity was measured through the Personal Attributes Questionnaire (PAQ). The PAQ typology included four groups based on PAQ masculinity and femininity scores: feminine (high femininity, low masculinity; coded as 1); masculine (low femininity, high masculinity; coded as 2); androgynous (high femininity, high masculinity; coded as 3); undifferentiated (low femininity, low masculinity; coded as 4).

Discussion

The Effects of Power, Sex, and Gender Identity on Relationship Style

Hypothesis 1: Sex. Hypothesis 1 was supported in the current study. Women reported an intended relationship style that was significantly more authentic, engaged, and empowering than men. This sex difference was supported in both a moderated multiple regression and an analysis of variance. These sex differences are clearly consistent with relational-cultural theory (e.g., Jordan et al., 1991) and other psychoanalytic and cultural feminist perspectives (e.g., Chodorow, 1978; Gilligan, 1982) that suggest women exhibit a more connected relationship style than men. This is also consistent with previous research linking women to more relationally interdependent self-construals (e.g., Cross & Madson, 1997; Gabriel & Gardner, 1999) and suggesting female-female friendships are characterized by greater mutually authentic, engaged, and empowering relationship styles than male-male friendships (Genero et al., 1992).

The current results contradict the findings of Neff and Harter (2002, 2003), which failed to find sex differences in relationship styles. The discrepancy in the findings between these studies may relate to the different relationship domains assessed (i.e., faculty-student mentoring relationships versus relationships with family, friends, and romantic partners). However, other research has produced mixed results regarding sex differences in relationship style within the same domain (e.g., friendships; Genero et al., 1992; Neff & Harter, 2003). Thus, a more likely explanation may be that differences in measurement may explain discrepancies between the current results and those of Neff and Harter (2002, 2003). The current study used a minimally modified version of a continuous measure of relationship styles used in research finding sex differences

(Genero et al., 1992), whereas the research by Neff and Harter (2002, 2003) used a less powerful categorical measure of relationship styles. In addition, the current study used a measure of behavioural intention whereas Neff and Harter's research used a self-report measure of actual behaviour within participants' current relationships.

The use of a behavioural intention scale is a limitation of the current study but was selected to allow for an experimental design that was absent in the relationship style literature. Further, the use of a behavioural intention scale in the current study was based on precedents in related research on sex differences in self-construals (Gabriel & Gardner, 1999) and sex versus power differences in influence strategies (Sagrestano, 1992). Therefore, there were different limitations to both the current study and Neff and Harter's (2002, 2003) research that may have contributed to different findings. In addition, it must be remembered that the current findings regarding sex differences should be interpreted with caution given the significant interaction between sex and power (discussed below). Further research would help to provide more clarity regarding the presence or absence of sex differences in relationship style. This research could address current limitations in the literature through the use of a powerful, continuous scale to measure actual behaviour (like Genero et al., 1992) in current relationships (e.g., faculty-student mentoring relationships) while also examining power (like Neff and Harter, 2002, 2003, and the current study) and gender identity (like in the current study).

Hypothesis 2: Femininity. Hypothesis 2 was also supported in the current study. Moderated multiple regression results indicated that participants with more feminine personalities reported an intended relationship style that was significantly more authentic, engaged, and empowering than participants self-reporting fewer feminine traits. Analysis

of variance also revealed a significant main effect of gender identity such that androgynous and feminine participants, who both had high femininity scores, intended a relationship style characterized by greater authenticity, engagement, and empowerment than undifferentiated participants with low femininity scores (who ultimately had the lowest modified MPDQ relationship style scores overall). The finding that masculine participants, who also had low femininity scores, did not significantly differ from androgynous and feminine participants in terms of intended relationship style may have been influenced by the lower statistical power associated with the analysis of a polychotomized continuous variable (Aguinis, 2004).

The finding that feminine and androgynous personalities were associated with more authentic, engaged, and empowering relationship styles than less feminine personalities, collapsed across both men and women, supports those who have recommended examining masculine/feminine traits in research on sex differences (e.g., Unger, 1979). Variability in femininity may have played a role in the inconsistency of findings between studies regarding sex differences in relationship styles in other relationship domains (e.g., Genero et al., 1992; Neff & Harter, 2002, 2003) and regarding sex differences in the psychosocial support provided by academic (e.g., Harden et al., 2009; Tenenbaum et al., 2001) and workplace mentors (e.g., Allen & Eby, 2004; Burke & McKeen, 1996). Research on behavioural differences between the sexes may be making false assumptions regarding the underlying traits of participants. Based on the current results, it is recommended that research examining sex differences measure these underlying traits (i.e., masculinity/femininity) rather than assume their presence.

Hypothesis 3: Power. Hypothesis 3 was not supported in the current study. Some feminist scholars have argued that observed sex differences in behaviour may relate to underlying power differences between the sexes; in other words, women's behaviour is linked to their relatively low power (e.g., Yoder & Kahn, 1992). Further, previous research has linked high power to less connected relationship styles (Neff & Harter, 2002, 2003). Thus, women and participants in the low-power student condition in the experiment were expected to have a more connected relationship style. The results showed that women were associated with an intended relationship style of greater authenticity, engagement, and empowerment. However, unexpectedly, this more connected relationship style was significantly associated with the high-power condition (i.e., faculty mentor) in the regression analysis and was non-significant in the ANOVA. This finding is best understood in relation to the significant interactions that were detected.

Moderated multiple regression revealed a significant three-way interaction, in which only high-femininity participants showed a sex-by-power interaction while low-femininity participants had overall low modified MPDQ scores. Subsequent analysis of variance indicated this pattern was likely due to the overall low modified MPDQ scores of the undifferentiated group (who scored low on both femininity and masculinity) rather than a difference in the actual pattern of the sex-by-power interaction among participants with different gender identities (i.e., masculine, feminine, androgynous, undifferentiated). Thus, the most important finding was the significant sex-by-power interaction. The sex-by-power interaction revealed in both the regression and ANOVA indicated that female participants in the high-power mentor condition intended a relationship style

characterized by significantly greater authenticity, engagement, and empowerment than male participants in the high-power mentor condition. Further, male and female participants in the low-power student condition intended similar relationship styles (i.e., there were no significant sex differences in the low-power condition). Additionally, the simple effect of power on relationship style for each sex showed that female participants in the high-power mentor condition intended a relationship style characterized by significantly greater authenticity, engagement, and empowerment than female participants in the low-power student condition. Further, male participants in both power conditions intended similar relationship styles (i.e., there were no significant differences on the basis of power condition among males).

A number of explanations may be offered for the significant sex-by-power interaction. One possible explanation for the significant sex differences in the high-power condition is that female and male participants in the mentor condition had different personal perspectives on the meaning and use of power; specifically, women may have approached power in a way that was more relational than men (i.e., they could be authentic, engaged, and empowering in a relationship while holding a powerful position in that relationship). This explanation would be consistent with relational-cultural theory and Miller's (1991) discussion of women equating traditional conceptualizations of power with selfishness and destructiveness, and women being more comfortable with the idea of mutual empowerment within a relationship. This would also be consistent with research suggesting women see power as personal autonomy, which they differentiated from men's and society's definition of power as money and control over others (Miller & Cummins, 1992).

A second possible explanation is that women reacted to the high-power position differently from men due to perceived social pressure to act more interpersonally agreeable in that role than men. Experimental research by Haines and Kray (2005) indicated that although an experimental power manipulation increased women's implicit self-identification with power and masculine traits (through an implicit association test), they still did not explicitly identify themselves with power and masculine traits. The authors concluded that women may have been engaging in impression management and did not want to present themselves as dominant or masculine. Research on women's power suggests that women are more influential by showing warmth combined with competence rather than through assertiveness, direct authority, and competence without warmth (see Carli, 1999, for a review). Although women's self-reported masculine traits have increased over time (Twenge, 1997), women and men still seem to differ on certain masculine traits such as "aggressive," "forceful," and "competitive" (Spence & Buckner, 2000). Further, women's ratings of the social desirability of masculine traits for women has increased but not to the same extent as men's ratings of the social desirability of masculine traits for women, which is suggestive of women's experiences of pressure to avoid these types of traits and behaviours (Auster & Ohm, 2000). Similarly, men's self-reported feminine traits have not appreciably increased over time (Twenge, 1997), which may reflect social pressure to avoid these qualities. This may help to explain the lower modified MPDQ scores of male participants in the mentor (high-power) condition.

The second explanation seems more likely when one considers the non-significant sex differences in relationship styles among participants in the student (low-power) condition. This similarity in relationship style contradicts relational-cultural theory's

position that women are more relational than men (e.g., Jordan et al., 1991). Further, the significant differences in relationship style between female participants in the two power conditions (with female mentors intending a more authentic, engaged, and empowering relationship style) may reflect a pressure for high-power women to over-compensate for their power and present themselves as even more relational than low-power women. Additionally, male participants in the student (low-power) condition intended a relationship style that was more authentic, engaged, and empowering than male participants in the mentor (high-power) condition, but this difference was not significant. The non-significant differences in relationship style between male participants in the two power conditions may reflect social pressure on men to not present themselves as relational. Timeslots for experiment participation were arranged for male and female participants separately (in an attempt to balance the numbers of the two groups; see Methods section), which may have made sex a salient characteristic for participants and influenced their responses to be more stereotyped. Sex and gender identity were also explicitly discussed in the informed consent form, although specific hypotheses were not detailed. Further, the likelihood of an impression management explanation for the current results may be even greater given behavioural intentions were measured rather than actual behaviours.

The use of a behavioural intention scale rather than measuring self-reported behaviours or measuring actual behaviours is also central to a third explanation for the sex-by-power interaction. It is possible that participants in the student condition provided an accurate report of their relationship style because of their lived experiences as students interacting with professors. In contrast, participants in the faculty mentor condition may

have relied on sex stereotypes to anticipate their relationship style in that unfamiliar role. Thus, sex differences in relationship style were detected in the mentor but not the student power conditions. This would suggest that there may be problems with the use of behavioural intention scales in experimental research. Although in this case participants were anticipating their behaviour in what is assumed to be a completely unfamiliar role, it is unknown how far this problem may extend to other unfamiliar situations presented in other research finding sex differences in behavioural intentions (Gabriel & Gardner, 1999). This is a limitation of the current experiment (and potentially other studies), but if undergraduate students rely on sex stereotypes to anticipate their future behaviour in unfamiliar roles and situations, this may also be an important finding that could be explored further. This possibility would be consistent with recent qualitative research showing young women discussing their futures emphasize their autonomy and choice but still picture their future selves as women defined by the traditional roles of mother and wife, particularly “intensive mothering” (Jacques & Radtke, 2012).

Future research could also address this limitation by using measures of actual behaviour rather than behavioural intention scales and explore the other two possible explanations presented above. For example, one could measure participants’ conceptualizations of power (e.g., “power over” versus “power to” or “power with”; Miller, 1991b; Miller & Cummins, 1992) and then examine main effects and interactions between manipulated power, sex and conceptualizations of power on relationship style measured through actual behaviours rather than self-reports or behavioural intentions. Alternatively, field research measuring the actual behaviour of faculty mentors and their student protégés could examine this issue further.

Theoretical and Practical Implications

Within the context of faculty-student mentoring, the current study tested differences in relationship style based on sex proposed by psychoanalytic and cultural feminists (e.g., Jordan et al., 1991), differences in relationship style based on gender identity rather than sex, as recommended by feminists such as Unger (1979), and differences in relationship style based on power rather than sex, as recommended by feminists such as Yoder and Kahn (1992). In short, sex differences were detected which support psychoanalytic and cultural feminists, differences based on gender identity were detected which support feminists recommending attention to these traits as opposed to just sex, but significant power differences were not in the predicted direction. Instead power affected men and women differently, which may have reflected a gendered understanding of power predicted by cultural feminists (e.g., Miller, 1991b) or may have reflected social pressure on women and men to act according to stereotypes (e.g., women's desire to combine power with interpersonal warmth to avoid negative consequences; see Carli, 1999, for a review). Thus, the strongest theoretical implication of the current study is that multiple perspectives add value to our understanding of human behaviour, and researchers should consider multiple perspectives in their study designs. Future research can build on the current results to further disentangle the contributions of these varied perspectives and address the limitations of the current study, including the use of a behavioural intention scale which may have also contributed to the interaction detected (as discussed above).

The overall purpose of this study was to identify factors influencing relational mentoring characterized by mutual authenticity, engagement, and empowerment. There

are different factors that go into selecting potential mentors or protégés but if one were to make a selection based on relational mentoring, which appears to have an impact on student's psychological health (see Study 1), the current results have practical implications for this selection. Specifically, the results suggest that students seeking relational mentoring should choose a faculty mentor with more feminine personality traits (e.g., interpersonal warmth) and/or a female mentor. It should also be noted that one's own relationship style should emphasize authenticity, engagement, and empowerment in order to have a *mutually* authentic, engaged, and empowering relationship with one's mentor.

Having said that, there are limitations to these conclusions given they are based solely on the results of an experiment involving undergraduate student responses on a behavioural intention scale of relationship style. Study 1's survey research indicated that female mentors were significantly associated with greater relational mentoring than male mentors. However, this survey research is the only study to date quantitatively examining faculty-graduate student relational mentoring and it had its own limitations. It focused exclusively on students' perspectives on the relationship and did not include data on other factors potentially impacting the mentor's relationship style (i.e., gender identity) or disentangle the relative contributions of both parties and their relative positions of power. The current experiment was designed to address this gap in our understanding of mentoring relationships, and although there are clear limitations to the design and conclusions from this research, several important leads have emerged that can be investigated further to provide stronger recommendations in the pursuit of mutually authentic, engaging, and empowering mentoring relationships.

Field research can assess the self-reported or observed relationship styles of both mentors and protégés and the impact of their sex, gender identity, and power (and/or conceptualizations of power) on relationship styles. However, it must be remembered that gains in external validity are achieved at the expense of introducing potential confounds. For example, this research should consider the potential effects of the other party's sex, gender identity, and relationship style on one party's relationship style, as well as other environmental influences (e.g., departmental culture and policies, other students in the research laboratory, involvement of multiple faculty mentors). Johnson's (2014) discussion of factors potentially influencing the quality of mentoring provided in a developmental relationship can help to guide this research. The complex influences on faculty-student relational mentoring would have to be examined through multiple studies of varying methodologies and years of research. The current study has provided a way forward for this research.

Study Limitations and Directions for Future Research

The strongest limitations of the current experiment surround the issue of external validity. First, the use of a behavioural intention scale means that it is unknown how well these results apply to actual behaviours. However, this question can be addressed in future field research with either self-reported mentoring relationship styles or observed mentoring relationship styles (although this operationalization has yet to be developed). A behavioural intention scale was chosen based on precedent in other experimental research examining sex and/or power differences in self-construals and influence strategies (Gabriel & Gardner, 1999; Sagrestano, 1992), and the specific scale was selected to assess those aspects of mentoring relationship authenticity, engagement, and

empowerment specifically linked to student psychological health (see Study 1).

Therefore, although there were limitations to the current design, it was grounded in the relevant literature and future research can build on the current findings.

Second, the experiment was designed to isolate the effects of three predictors of the relationship styles of both mentors and protégés, but the greater resulting internal validity and simplicity of the experiment was achieved at the expense of not knowing the applicability of the current results to the daily lived experiences of mentors and protégés in complex relationships. However, this was the first study to examine the interactive effects of sex, gender identity, and power on relationship style in the feminist psychological literature and the first study to examine any predictors of relationship styles (i.e., authenticity, engagement, empowerment) in faculty-student mentorships specifically. The current study was needed to provide a foundation for future investigations of these predictors that can allow for greater complexity. As mentioned previously, future research can examine the effects of these predictors on the actual relationship styles of both parties while also examining other factors, such as the effects of the other party's sex, femininity, and relationship style on one party's relationship style, and the effects of contextual factors (e.g., departmental culture).

The third issue with external validity in the current study relates to the experimental manipulation of power. Specifically, how many faculty-student mentoring relationships would fit the vignettes used to create a strong power differential in the current study? Study 1's survey research indicated there is variability in the social power of faculty mentors in relation to their graduate students, but the overall prevalence of faculty-student mentoring relationships with strong versus minimal power differentials is

not known given the response rate and representativeness of the relationships surveyed was also unknown. The representativeness of the faculty mentor and student protégé vignettes used in the current experiment to the “typical” mentoring relationship is unknown but the descriptions should be within the realm of possible relationship dynamics. The vignettes were based on Carleton University guidelines regarding thesis supervisor-student relationships, research literature on mentoring functions (Kram, 1983) and social power (Raven et al., 1998), and my personal knowledge of these relationships based on informal conversations with my peers and formal interviews completed as part of a graduate course in qualitative research methods.

The difficulty of developing unprecedented vignettes to represent mentoring relationships between thesis advisors and students while emphasizing the significant power differential between the two roles in a short description that first- and second-year undergraduate students could quickly read and understand was evidenced by the fact that it took two attempts and several months of pilot research. Ultimately, these efforts were successful in the sense that participants recognized the power differential between the two conditions (resulting in a successful manipulation check) and significant results on the basis of power condition emerged. Future experimental research can adjust the balance of the different elements incorporated in these vignettes to attempt to make them more representative of typical mentoring relationships (once research has established the power dynamics of the “typical” mentoring relationship, of course) and/or field research can continue the investigation of the predictors of relationship styles in existing mentoring relationships.

The greatest limitation of this research (i.e., limits to external validity given its experimental design) is also its greatest strength. Experts in the field have noted the unsophisticated research designs (typically retrospective surveys) used in the relatively young field of mentoring research (Johnson et al., 2007). These same experts have suggested experimental research using vignettes may be fruitful, although their recommendations identified other variables for examination, rather than specifically looking at the effects of sex, gender identity, and power on relationship styles. Experimental research is also noticeably absent in the feminist psychological literature on relationship styles. The experimental design in the current study was needed to isolate the effects of multiple predictors that have not been simultaneously explored previously in either the mentoring or feminist psychological literature on relationship styles. Thus, the current experiment significantly contributed to both literatures and may be used to guide future research on relationship styles generally and within mentoring relationships specifically (as discussed previously).

Conclusions

The current study used a novel experimental design to address a critical gap in our understanding of faculty-student mentoring: what influences relational mentoring? The results suggest the answer is complicated but involves at least three factors: the sex, gender identity (i.e., masculine, feminine traits) and power of the relative parties. The practical importance of this research is underscored by research indicating relational mentoring is significantly correlated with student psychological health (see Study 1). The experiment was grounded in feminist psychological perspectives (e.g., Jordan et al., 1991; Unger, 1979; Yoder & Kahn, 1992), and thus, had important implications for

feminist theory as well. The current results should be replicated and extended in future research. Several recommendations for future research that address this study's limitations have been provided here to inform this work. Therefore, this study represents a significant step forward in the field and provides a solid foundation for future research.

Chapter 4: General Discussion

Summary of Key Findings

A review of the literature in Chapter 1 identified two key research questions that had yet to be addressed in the mentoring and feminist psychological literatures: 1) is faculty-graduate student relational mentoring correlated with positive psychological health outcomes for students, and is this correlation moderated by student sex, student gender identity, and/or the particular power dynamics of the relationship; and 2) does sex, gender identity, and/or situational power predict whether an individual adopts a relationship style associated with relational mentoring (i.e., mutually authentic, engaged, empowering)?

In Chapter 2 survey research was described in detail that explored relational mentoring between faculty thesis advisors and graduate students from a sample of universities across Canada. Descriptive statistics indicated the overall sample from Study 1 experienced generally positive, mutually authentic, engaging, and empowering mentoring relationships with their thesis advisors. Further, the sample appeared fairly representative of the general population in terms of self-esteem and life satisfaction, but interestingly, their reported depressive symptoms appeared higher than those reported in the general population. Most importantly, hypothesis testing indicated that faculty-graduate student relational mentoring was significantly negatively correlated with students' depressive symptoms, and significantly positively correlated with students' self-esteem and life satisfaction. These correlations were not significantly moderated by student sex, student gender identity, or the power dynamics of the individual faculty-graduate student mentoring relationships. Additionally, the power dynamics of the

individual faculty-graduate student mentoring relationships was the strongest predictor of student depression, self-esteem and life satisfaction. In particular, graduate students reporting their faculty mentors were influencing them through harsh social power (e.g., influencing students through deliberate punishments) reported poorer psychological health in terms of more depressive symptoms, lower self-esteem, and lower life satisfaction.

Chapter 3 introduced an experiment designed to address the second research question and determine whether sex, gender identity, and/or power influence whether an individual adopts a relationship style conducive to relational mentoring. Following two pilot studies, the final online experiment included randomly assigning undergraduate student participants to either a faculty mentor role or student researcher role, asking participants to imagine themselves in this described role, and indicate the relationship style they would adopt in that role. Participants were also asked to indicate their sex and gender identity (i.e., masculine, feminine traits). The overall results of Study 2 indicated that all three factors were involved in relationship style: 1) women reported they would adopt a more authentic, engaged, and empowering relationship style than men, 2) participants with more feminine traits reported they would adopt a more authentic, engaged, and empowering style than participants with fewer feminine traits, and 3) power interacted with sex such that there appeared to only be sex differences in the faculty mentor role, and women in that power role reported they would adopt a more authentic, engaged, and empowering style than men.

Taken together, the main findings of these two studies suggest that relational mentoring is correlated with positive psychological health for all graduate students, and

that individuals with more feminine traits and women (particularly women in high-power mentoring roles) are most likely to adopt relationship styles that characterize relational mentoring. The current results contribute to the mentoring literature by providing the first quantitative examination of the construct of relational mentoring (Johnson, 2014; Liang et al., 2002a; Ragins, 2012) in faculty-graduate student relationships, and contribute to the feminist psychological literature by testing key assumptions of relational-cultural theory (e.g., Jordan, 2008; Jordan et al., 1991) that are shared with other perspectives within the “differences tradition” (see Kimball, 1994, for a review) while incorporating critiques of the “differences tradition.” The results have supported the concurrent validity of relational mentoring and provided mixed support for hypothesized sex differences (e.g., Miller, 1991a) and alternative hypotheses on the basis of gender identity (e.g., Unger, 1979) and power (e.g., Yoder & Kahn, 1992). In other words, relational mentoring appears to be important to graduate student psychological health, and whether one’s relationship style is consistent with relational mentoring appears to be influenced by several factors (i.e., sex, gender identity, one’s role as mentor or student).

Practical Implications

There are several practical implications of the key findings of the current research, which were discussed at length in Chapters 2 and 3. First, the survey results suggested graduate students in multiple disciplines may be at increased risk of depression, relative to the general population. These findings suggest the importance of the provision of psychological health care services to graduate students and underscore the importance of research into factors impacting the psychological health of graduate

students across disciplines, including the current research. Study 1 specifically identified relational mentoring (Johnson, 2014; Liang et al., 2002a; Ragins, 2012) as a correlate of decreased depressive symptoms and increased self-esteem and life satisfaction in graduate students. Harsh social power (Raven et al., 1998) was also correlated with student psychological health but in the opposite directions (specifically, increased depressive symptoms and decreased self-esteem and life satisfaction). Based on these findings, it may be recommended that students consider the relational abilities of mentors and mentors' approaches to power specifically when selecting faculty advisors and potential mentors, in the interest of their own psychological health. In other words, it appears inadvisable to base one's mentor selection exclusively on other aspects of the relationship, such as career functions correlated with increased research productivity (e.g., Lunsford, 2012; Tenenbaum et al., 2001). The results of Study 2's experiment also have potential practical implications for students' selection of their thesis advisors and potential mentors. Specifically, the results suggest that students seeking relational mentoring should choose an advisor with more feminine personality traits (e.g., interpersonal warmth) and/or a female advisor.

Given there may be practical limits to the amount of choice students have in their thesis advisors, some attention should also be paid to what faculty and departments can do to promote the psychological health of their students. Study 1's results support recommendations that mentoring be considered in the hiring, training and evaluation of faculty (e.g., Johnson, 2002; Johnson & Nelson, 1999). More specifically, the current results suggest relational mentoring and constructive approaches to power (e.g., a focus on soft, noncoercive power as opposed to harsh, coercive power; Raven et al., 1998)

should be topics for discussion in training and in these sorts of decisions. Training in this area may also change the results of future research regarding who is most likely to develop relational mentoring; in other words, relational mentoring may no longer be significantly associated with female mentors or those with pre-existing feminine personality traits. Development of relational mentoring training may benefit from a review of similar interventions informed by relational-cultural theory, such as the Open Circle: Social Competency Program that builds relational skills in elementary school students and has shown promising results (Liang, Tracy, Kenny, & Brogan, 2008).

The likelihood of these implications being acted upon within academia is unknown. There is evidence that graduate students are considering faculty members' use of power when deciding whether to include them on their dissertation committees (Aguinis et al., 1996). However, given the extremely competitive environment within which graduate students operate and the importance of publication records to their future employment prospects, it may be unlikely that the considerations discussed above will be given much weight beyond perhaps deciding between two potential advisors with comparable research prowess.

Similarly, competitions for funding within the academic community understandably make research productivity a priority in hiring and promotional decisions. Moreover, there may be difficulties in assessing a candidate's ability to provide relational mentoring for such decisions. Johnson (2002) suggested mentoring abilities could be assessed "through behaviorally based interviewing and contact with some of the candidate's former graduate students" (p. 92). However, it is unclear how mentoring would be assessed in that interview. Additionally, it may be difficult for students to

provide anonymous feedback on a mentor's abilities given the small numbers of protégés that may be associated with a single mentor (i.e., likely smaller numbers than those involved in anonymous teaching evaluations), and a mentor asking a protégé for a reference letter may be inappropriate and inaccurate given the overall power differential involved (i.e., with mentors having more power) and the resulting unlikelihood of a protégé providing a poor reference for a mentor. Even former graduate students may be continuing protégés of the candidate as they embark on the early stages of their new careers. With that being said, the university seems an appropriate environment to develop creative solutions to such assessment issues if there is a will to do so. Future research that builds on the current findings and addresses some of these studies' limitations can further highlight the benefit of these efforts.

Limitations and Directions for Future Research

The conclusions and implications discussed thus far in this chapter must be understood with the limitations of the current research in mind. These limitations were presented in detail in Chapters 2 and 3, and included common limitations in mentoring research, such as the use of cross-sectional data, and unknown and potentially low response rates in Study 1. The experimental design of Study 2 was not common to the mentoring literature, but it included limitations common to experimental designs, such as issues with external validity relating to the representativeness of the vignettes used in the power manipulation and the generalizability of the behavioural intention scale that served as the dependent variable. Future research may build on the current findings and address some of the limitations discussed.

Future longitudinal research can go further to supporting a time-ordered relationship between relational mentoring and student psychological health and the power dynamics of faculty-graduate student mentoring and student psychological health. Further, longitudinal research may investigate psychological health as a mediator in the relationship between the relational dynamics of mentoring and other outcomes, such as mentoring relationship termination or student drop-outs. The addition of other covariates may strengthen future research examining the impacts of relational mentoring on student psychological health. Several covariates were examined in Study 1 (e.g., structural qualities of the relationship such as degree of contact and length of relationship), but future research may benefit from simultaneously examining the impact of the quality of multiple relationships (e.g., with partners, peers) on graduate student psychological health outcomes. Limitations regarding the operationalization of power as a moderator in Study 1 may also be addressed in future research. Further research is needed to assess the relative power of mentor versus student roles as a moderator of the association between relational mentoring and the psychological health outcomes of each party. Future research could also examine other measures of the power dynamics of the relationship, including mentor perceptions of their own social power, and these influences on student outcomes.

Future experimental research can adjust the balance of the different elements incorporated in Study 1's vignettes to attempt to make them more representative of typical mentoring relationships (once research has established the power dynamics of the "typical" mentoring relationship, of course) and/or field research can continue the investigation of the predictors of relationship styles in existing mentoring relationships.

This field research could use either self-reported mentoring relationship styles or observed mentoring relationship styles (although this operationalization has yet to be developed). Additionally, this research can examine the effects of these predictors on the actual relationship styles of both parties while also examining other factors, such as the effects of the other party's sex, femininity, and relationship style on one party's relationship style, and the effects of contextual factors (e.g., departmental culture). Johnson's (2014) discussion of factors that may impact the degree of mentoring in a given developmental relationship (e.g., training environment, number of students/trainees assigned to a trainer, motivation, competence) may guide this research. Qualitative research may also be helpful in understanding the complexity of relational mentoring as it is experienced by graduate students and how it relates to other areas of their lives.

Conclusions

Since Levinson, Darrow, Klein, Levinson, and McKee's (1978) discussion of the mentor's role "to support and facilitate the realization of the Dream" (p. 98), theoretical developments have expanded our understanding of what mentoring is to include psychosocial and career functions (Kram, 1983), and now the concept of relational mentoring (Johnson, 2014; Liang et al., 2002a; Ragins, 2012). Recent research has also expanded our understanding of the outcomes of mentoring from those associated with academic life, such as graduate student research productivity and satisfaction with one's advisor (e.g., Lunsford, 2012; Tenenbaum et al., 2001), to include undergraduate student psychological health (Liang et al., 2002a). The current research has filled a critical gap in the mentoring literature with an unprecedented quantitative study demonstrating a correlation between *faculty-graduate student* relational mentoring and student

psychological health. These findings support a prominent feminist psychological theory, relational-cultural theory, in its suggestion that growth-fostering connections characterized by mutual authenticity, engagement, and empowerment are associated with positive psychological health and development (e.g., Jordan, 2008; Jordan et al., 1991). Additionally, the current research filled a critical gap in both the mentoring and feminist psychological literatures by testing two assumptions regarding sex differences in the importance of relational mentoring to psychological health, and sex differences in the propensity to engage in relational mentoring. The cumulative results of survey research and an experiment addressing the first and second assumptions, respectively, provided support for both the “similarities tradition” and “differences tradition” within feminist psychology (see Kimball, 1994, for a review). In particular, similarities were observed in the impact of relational mentoring on male and female graduate students surveyed, and differences were observed in the inclination of female and male experiment participants to engage in relational mentoring (i.e., with women particularly inclined to do so). The experiment results also indicated that feminine traits (collapsed across participant sexes) were predictive of a more authentic, engaged, and empowering relationship style, and an interaction between participant sex and power condition indicated that female mentors were most likely to adopt this particular style in a mentoring relationship. Thus, the results also supported those that advocate for the consideration of gender identity (e.g., Unger, 1979) and situational power (e.g., Henley, 1977; Yoder & Kahn, 1992) when examining sex differences in behaviour.

The contributions of the current research detailed in Chapters 2 and 3 to the mentoring and feminist psychological literatures introduced in Chapter 1 were thoroughly

discussed. Despite the limitations outlined previously, future research can build on these novel findings and further expand our understanding of faculty-graduate student mentoring and the complex factors involved in human behaviour generally (including those proposed within the feminist psychological literature). Some guidance has been offered for these efforts in this chapter. The potential of this research to inform and empower students and mentors to maximize the positive outcomes of their endeavours was discussed in the practical implications section of this chapter as well. The importance of continuing this research is underscored by evidence suggesting the elevated risk of depression in graduate students provided in the previous literature (e.g., Peluso, Carleton, & Asmundson, 2011) and in the current survey research. Relational mentoring may help graduate students to *realize the dream* of completing their degrees while maintaining positive psychological health.

References

- Aguinis, H. (2004). *Regression analysis for categorical moderators*. New York: Guilford Press.
- Aguinis, H., Nesler, M. S., Quigley, B. M., Lee, S. J., & Tedeschi, J. T. (1996). Power bases of faculty supervisors and educational outcomes for graduate students. *Journal of Higher Education, 67*(3), 267-297.
- Allen, T. D., & Eby, L. T. (2004). Factors related to mentor reports of mentoring functions provided: Gender and relational characteristics. *Sex Roles, 50*(1/2), 129-139.
- Arrindell, W. A., Heesink, J., & Feij, J. A. (1999). The Satisfaction With Life Scale (SWLS): Appraisal with 1700 healthy young adults in the Netherlands. *Personality and Individual Differences, 26*, 815-826.
- Auster, C. J., & Ohm, S. C. (2000). Masculinity and femininity in contemporary American society: A reevaluation using the Bem Sex-Role Inventory. *Sex Roles, 43*(7/8), 499-528.
- Baumeister, R. F., & Sommer, K. L. (1997). What do men want? Gender differences and two spheres of belongingness: Comment on Cross and Madson (1997). *Psychological Bulletin, 122*(1), 38-44.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory – II*. San Antonio, TX: Psychological Corp.
- Bem, S. L. (1974). The measure of psychological androgyny. *Journal of Consulting and Clinical Psychology, 42*(2), 155-162.

- Bergman, S. J. (1995). Men's psychological development: A relational perspective. In R. F. Levant, & W. S. Pollack (Eds.), *A new psychology of men* (pp.68-90). New York: HarperCollins.
- Burke, R. J., & McKeen, C. A. (1996). Gender effects in mentoring relationships. *Journal of Social Behavior and Personality, 11*(5), 91-104.
- Burnett, J. W., Anderson, W. P., & Heppner, P. P. (1995). Gender roles and self-esteem: A consideration of environmental factors. *Journal of Counseling & Development, 73*, 323-326.
- Carleton University Faculty of Graduate and Postdoctoral Affairs. (n.d.). *Graduate supervision*. Retrieved from <http://www5.carleton.ca/fgpa/research/graduate-supervision/>
- Carli, L. L. (1999). Gender, interpersonal power, and social influence. *Journal of Social Issues, 55*(1), 81-99.
- Chang, E. C., & Sanna, L. J. (2001). Optimism, pessimism, and positive and negative affectivity in middle-aged adults: A test of a cognitive-affective model of psychological adjustment. *Psychology and Aging, 16*(3), 524-531.
- Chodorow, N. (1978). *The reproduction of mothering: Psychoanalysis and the sociology of gender*. Los Angeles, CA: University of California Press.
- Clark, R. A., Harden, S. L., & Johnson, W. B. (2000). Mentor relationships in clinical psychology doctoral training: Results of a national survey. *Teaching of Psychology, 27*, 262-268.

- Clay, R. A. (2013, December). Mental health issues in college on the rise: APA is working with the White House to help address the problem. *Monitor on Psychology, 44*(11), 54-55.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd Ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Crawford, M. & Unger, R. (2004). *Women and gender: A feminist psychology* (4th ed.). New York: McGraw-Hill.
- Cross, S. E., & Madson, L. (1997). Models of the self: Self-construals and gender. *Psychological Bulletin, 122*(1), 5-37.
- Deaux, K. (1985). Sex and gender. *Annual Review of Psychology, 36*, 49-81.
- Deaux, K., & Major, B. (1990). A social-psychological model of gender. In D. L. Rhode (Ed.), *Theoretical perspectives on sexual difference* (pp. 89-99). New Haven, CT: Yale University Press.
- Deaux, K., & Stewart, A. J. (2001). Framing gendered identities. In R. K. Unger (Ed.), *Handbook of the psychology of women and gender* (pp. 84-97). New York: John Wiley & Sons.
- Deci, E. L., La Guardia, J. G., Moller, A. C., Scheiner, M. J., & Ryan, R. M. (2006). On the benefits of giving as well as receiving autonomy support: Mutuality in close friendships. *Personality and Social Psychology Bulletin, 32*, 313-327.
- Demo, D. H. (1985). The measurement of self-esteem: Refining our methods. *Journal of Personality and Social Psychology, 48*(6), 1490-1502.

- DeShon, R. P., & Alexander, R. A. (1996). Alternative procedures for testing regression slope homogeneity when group error variances are unequal. *Psychological Methods, 1*(3), 261-277.
- Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology, 68*(4), 653-663.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment, 49*(1), 71-75.
- Dozois, D. J. A., Dobson, K. S., & Ahnberg, J. L. (1998). A psychometric evaluation of the Beck Depression Inventory – II. *Psychological Assessment, 10*(2), 83-89.
- Eby, L. T., Butts, M. M., Durley, J., & Ragins, B. R. (2010). Are bad experiences stronger than good ones in mentoring relationships? Evidence from the protégé and mentor perspective. *Journal of Vocational Behavior, 77*, 81-92.
- Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry, 77*(4), 534-542.
- Elias, S. M., & Loomis, R. J. (2004). The effect of instructor gender and race/ethnicity on gaining compliance in the classroom. *Journal of Applied Social Psychology, 34*(5), 937-958.
- Elias, S. M., & Mace, B. L. (2005). Social power in the classroom: Student attributions for compliance. *Journal of Applied Social Psychology, 35*(8), 1738-1754.
- Erchul, W. P., Raven, B. H., & Ray, A. G. (2001). School psychologists' perceptions of social power bases in teacher consultation. *Journal of Educational and Psychological Consultation, 12*(1), 1-23.

- Forehand, R. L. (2008). The art and science of mentoring in psychology: A necessary practice to ensure our future. *American Psychologist*, 63(8), 744-755.
- Franke, A. H. (2004, June 25). When students kill themselves, colleges may get the blame. *The Chronicle of Higher Education*. Retrieved from <http://chronicle.com/article/When-Students-Kill-Themselves/21154/>
- Frey, L. L. (2013). Relational-cultural therapy: Theory, research, and application to counseling competencies. *Professional Psychology: Research and Practice*, 44(3), 177-185.
- Frey, L. L., Beesley, D., & Miller, M. R. (2006). Relational health, attachment, and psychological distress in college women and men. *Psychology of Women Quarterly*, 30, 303-311.
- Frey, L. L., Tobin, J., & Beesley, D. (2004). Relational predictors of psychological distress in women and men presenting for university counseling center services. *Journal of College Counseling*, 7, 129-139.
- Gabriel, S., & Gardner, W. L. (1999). Are there "his" and "hers" types of interdependence? The implications of gender differences in collective versus relational interdependence for affect, behaviour, and cognition. *Journal of Personality and Social Psychology*, 77(3), 642-655.
- Genero, N. P., Miller, J. B., Surrey, J., & Baldwin, L. M. (1992). Measuring perceived mutuality in close relationships: Validation of the Mutual Psychological Development Questionnaire. *Journal of Family Psychology*, 6(1), 36-48.
- Gilbert, L. A., & Evans, S. (1985). Dimensions of same-gender student-faculty role-model relationships. *Sex Roles*, 12(1/2), 111-122.

- Gilbert, L. A., & Rossman, K. M. (1992). Gender and the mentoring process for women: Implications for professional development. *Professional Psychology: Research and Practice*, 23(3), 233-238.
- Gilligan, C. (1982). *In a different voice: Psychological theory and women's development*. Cambridge, MA: Harvard University Press.
- Glenn, D. (2010, March 31). Help to the finish line: Ways to reduce the number of Ph.D. dropouts. *The Chronicle of Higher Education*. Retrieved from <http://chronicle.com/article/Help-to-the-Finish-Line-Ways/64879/>
- Greenberger, E., Chen, C., Dmitrieva, J., & Farruggia, S. P. (2003). Item-wording and the dimensionality of the Rosenberg Self-Esteem Scale: Do they matter? *Personality and Individual Differences*, 35(6), 1241-1254.
- Haines, E. L., & Kray, L. J. (2005). Self-power associations: The possession of power impacts women's self-concepts. *European Journal of Social Psychology*, 35, 643-662.
- Harden, S. L., Clark, R. A., Johnson, W. B., & Larson, J. (2009). Cross-gender mentorship in clinical psychology doctoral programs: An exploratory survey study. *Mentoring & Tutoring: Partnership in Learning*, 17(3), 277-290.
- Heinrich, K. T. (1995). Doctoral advisement relationships between women: On friendship and betrayal. *Journal of Higher Education*, 66(4), 447-469.
- Helmreich, R. L., Spence, J. T., & Wilhelm, J. A. (1981). A psychometric analysis of the personal attributes questionnaire. *Sex Roles*, 7(11), 1097-1108.
- Henley, N. M. (1977). *Body politics: Power, sex, and nonverbal communication*. Englewood Cliffs, NJ: Prentice-Hall.

- Hill, S. A., Fekken, G. C., & Bond, S. L. (2000). Factor structure integrity of the Personal Attributes Questionnaire: An English-French comparison. *Canadian Journal of Behavioural Science, 32*(4), 234-242.
- Howell, D. C. (2013). *Statistical methods for psychology* (8th ed.). Belmont, CA: Wadsworth.
- Jacques, H. A. K., & Radtke, H. L. (2012). Constrained by choice: Young women negotiate the discourses of marriage and motherhood. *Feminism & Psychology, 22*(4), 443-461.
- Johnson, W. B. (2002). The intentional mentor: Strategies and guidelines for the practice of mentoring. *Professional Psychology: Research and Practice, 33*(1), 88-96.
- Johnson, W. B. (2007). Student-faculty mentorship outcomes. In T. D. Allen & L. T. Eby (Eds.), *The Blackwell handbook of mentoring: A multiple perspectives approach* (pp. 189-210). Malden, MA: Blackwell Publishing.
- Johnson, W. B. (2014). Mentoring in psychology education and training: A mentoring relationship continuum model. In W. B. Johnson & N. J. Kaslow (Eds.), *The Oxford handbook of education and training in professional psychology* (pp. 272-290). New York: Oxford University Press.
- Johnson, W. B., & Huwe, J. M. (2002). Toward a typology of mentorship dysfunction in graduate school. *Psychotherapy: Theory/Research/Practice/Training, 39*(1), 44-55.
- Johnson, W. B., & Nelson, N. (1999). Mentor-protégé relationships in graduate training: Some ethical concerns. *Ethics & Behavior, 9*(3), 189-210.

- Johnson, W. B., Rose, G., & Schlosser, L. Z. (2007). Student-faculty mentoring: Theoretical and methodological issues. In T. D. Allen & L. T. Eby (Eds.), *The Blackwell handbook of mentoring: A multiple perspectives approach* (pp. 49-69). Malden, MA: Blackwell Publishing.
- Jordan, J. V. (2003). Relational-cultural therapy. In M. Kopala, & M. A. Keitel (Eds.), *Handbook of counseling women* (pp. 22-30). Thousand Oaks, CA: Sage.
- Jordan, J. V. (2008). Recent developments in relational-cultural theory. *Women & Therapy, 31*(2/3/4), 1-4.
- Jordan, J. V., Kaplan, A. G., Miller, J. B., Stiver, I. P., & Surrey, J. L. (Eds.). (1991). *Women's growth in connection: Writings from the Stone Center*. New York: Guilford Press.
- Kadison, R. D. (2004, December 10). The mental-health crisis: What colleges must do. *The Chronicle of Higher Education*. Retrieved from <http://chronicle.com/article/The-Mental-Health-Crisis-What/1712/>
- Kayser, K., Sormanti, M., & Strainchamps, E. (1999). Women coping with cancer: The influence of relationship factors on psychosocial adjustment. *Psychology of Women Quarterly, 23*, 725-739.
- 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*(23), 3095-3105.
- Kimball, M. M. (1994). The worlds we live in: Gender similarities and differences. *Canadian Psychology, 35*(4), 388-404.

- Kram, K. E. (1983). Phases of the mentor relationship. *Academy of Management Journal*, 26(4), 608-625.
- LaFrance, M., & Henley, N. M. (1994). On oppressing hypotheses: Or differences in nonverbal sensitivity revisited. In H. L. Radtke & H. J. Stam (Eds.), *Power/gender: Social relations in theory and practice*. London: Sage.
- Larsen, R. J., Diener, E., & Emmons, R. A. (1985). An evaluation of subjective well-being measures. *Social Indicators Research*, 17, 1-17.
- Leonard, D.M., Steer, R.A., Rissmiller, D.J., & Beck, A.T. (2009). Self-reported symptoms of depression by changes in sleeping patterns and appetities for outpatients with a major depressive episode. *Journal of Psychopathological Behavior Assessment*, 31, 67-73.
- Levinson, D. J., Darrow, C. N., Klein, E. B., Levinson, M. H., & McKee, B. (1978). *The seasons of a man's life*. New York: Alfred A. Knopf.
- Liang, B., Tracy, A., Kenny, M. & Brogan, D. (2008). Gender differences in the relational health of youth participating in a social competency program. *Journal of Community Psychology*, 36(4), 499-514.
- Liang, B., Tracy, A. J., Taylor, C. A., & Williams, L. M. (2002a). Mentoring college-age women: A relational approach. *American Journal of Community Psychology*, 30(2), 271-288.
- Liang, B., Tracy, A., Taylor, C. A., Williams, L. M., Jordan, J. V., & Miller, J. B. (2002b). The Relational Health Indices: A study of women's relationships. *Psychology of Women Quarterly*, 26, 25-35.

- Lunsford, L. (2012). Doctoral advising or mentoring? Effects on student outcomes. *Mentoring & Tutoring: Partnership in Learning, 20*(2), 251-270.
- Lyons, W., Scroggins, D., & Rule, P. B. (1990). The mentor in graduate education. *Studies in Higher Education, 15*(3), 277-285.
- Maher, M. A., Ford, M. E., & Thompson, C. M. (2004). Degree progress of women doctoral students: Factors that constrain, facilitate, and differentiate. *The Review of Higher Education, 27*(3), 385-408.
- Maltby, J., & Day, L. (2004). Should never the twain meet? Integrating models of religious personality and religious mental health. *Personality and Individual Differences, 36*, 1275-1290.
- Mertz, N. T. (2004). What's a mentor, anyway? *Educational Administration Quarterly, 40*(4), 541-560.
- Miller, J. B. (1976). *Toward a new psychology of women*. Boston, MA: Beacon Press.
- Miller, J. B. (1986). *Toward a new psychology of women* (2nd ed.). Boston, MA: Beacon Press.
- Miller, J. B. (1991a). The development of women's sense of self. In J. V. Jordan, A. G. Kaplan, J. B. Miller, I. P. Stiver, & J. L. Surrey (Eds.), *Women's growth in connection: Writings from the Stone Center* (pp. 11-26). New York: Guilford Press.
- Miller, J. B. (1991b). Women and power. In J. V. Jordan, A. G. Kaplan, J. B. Miller, I. P. Stiver, & J. L. Surrey (Eds.), *Women's growth in connection: Writings from the Stone Center* (pp. 197-205). New York: Guilford Press.

- Miller, J. B. (2008). Connections, disconnections, and violations. *Feminism & Psychology, 18*(3), 368-380.
- Miller, C. L. & Cummins, A. G. (1992). An examination of women's perspectives on power. *Psychology of Women Quarterly, 16*, 415-428.
- Munsey, C. (2010, April). More students – with more serious psychological issues – are showing up at campus counseling centers. *Monitor on Psychology, 41*(4), 10.
- Neff, K. D., Brabeck, K. M., & Kearney, L. K. (2006). Relationship styles of self-focused autonomy, other-focused connection, and mutuality among Mexican American and European American college students. *The Journal of Social Psychology, 146*(5), 568-590.
- Neff, K. D., & Harter, S. (2002). The authenticity of conflict resolutions among adult couples: Does women's other-oriented behavior reflect their true selves? *Sex Roles, 47*(9/10), 403-417.
- Neff, K. D., & Harter, S. (2003). Relationship styles of self-focused autonomy, other-focused connectedness, and mutuality across multiple relationship contexts. *Journal of Social and Personal Relationships, 20*(1), 81-99.
- O'Brien, K. E., Biga, A., Kessler, S. R., & Allen, T. D. (2010). A meta-analytic investigation of gender differences in mentoring. *Journal of Management, 36*(2), 537-554.
- Peluso, D. L., Carleton, R. N., & Asmundson, G. J. G. (2011). Depression symptoms in Canadian psychology graduate students: Do research productivity, funding, and the academic advisory relationship play a role? *Canadian Journal of Behavioural Science, 43*(2), 119-127.

- Pierro, A. Cicero, L., & Raven, B. H. (2008). Motivated compliance with bases of social power. *Journal of Applied Social Psychology, 38*(7), 1921-1944.
- Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics, 31*(4), 437-448.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*(3), 385-401.
- Ragins, B. R. (2012). Relational mentoring: A positive approach to mentoring at work. In K. S. Cameron & G. M. Spreitzer (Eds.), *The Oxford handbook of positive organizational scholarship* (pp. 519-536). New York: Oxford University Press.
- Raven, B. H., Schwarzwald, J., & Koslowsky, M. (1998). Conceptualizing and measuring a power/interaction model of interpersonal influence. *Journal of Applied Social Psychology, 28*(4), 307-332.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, New Jersey: Princeton University Press.
- Sagrestano, L. M. (1992). Power strategies in interpersonal relationships: The effects of expertise and gender. *Psychology of Women Quarterly, 16*, 481-495.
- Sanftner, J. L., Cameron, R. P., Tantillo, M., Heigel, C. P., Martin, D. M., Sippel-Silowash, J. A., & Taggart, J. M. (2006). Mutuality as an aspect of family functioning in predicting eating disorder symptoms in college women. *Journal of College Student Psychotherapy, 21*(2), 41-66.

- Sanftner, J. L., Ryan, W. J., & Pierce, P. (2009). Application of a relational model to understanding body image in college women and men. *Journal of College Student Psychotherapy, 23*, 262-280.
- 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*(2), 178-188.
- Schlosser, L. Z., Lyons, H. Z., Talleyrand, R. M., Kim, B. S. K., & Johnson, W. B. (2011). Advisor-advisee relationships in graduate training programs. *Journal of Career Development, 38*(1), 3-18.
- Schmitt, D. P., & Allik, J. (2005). Simultaneous administration of the Rosenberg Self-Esteem Scale in 53 nations: Exploring the universal and culture-specific features of global self-esteem. *Journal of Personality and Social Psychology, 89*(4), 623-642.
- Schwartz, H. L., & Holloway, E. L. (2012). Partners in learning: A grounded theory study of relational practice between master's students and professors. *Mentoring & Tutoring: Partnership in Learning, 20*(1), 115-135.
- Shevlin, M. E., Bunting, B. P., & Lewis, C. A. (1995). Confirmatory factor analysis of the Rosenberg Self-Esteem Scale. *Psychological Reports, 76*, 707-710.
- Sinclair, S. J., Blais, M. A., Gansler, D. A., Sandberg, E., Bistis, K., & LoCicero, A. (2010). Psychometric properties of the Rosenberg Self-Esteem Scale: Overall and across demographic groups living within the United States. *Evaluation & the Health Professions, 33*(1), 56-80.

Smallwood, S. (2004, January 16). Doctor dropout. *The Chronicle of Higher Education*.

Retrieved from <http://chronicle.com/article/Doctor-Dropout/33786/>

Snodgrass, S. E. (1985). Women's intuition: The effect of subordinate role on interpersonal sensitivity. *Journal of Personality and Social Psychology*, 49(1), 146-155.

Soper, D. S. (2014). Post-hoc Statistical Power Calculator for Hierarchical Multiple Regression [Software]. Available from <http://www.danielsoper.com/statcalc>

Spence, J. T. (1991). Do the BSRI and PAQ measure the same or different concepts? *Psychology of Women Quarterly*, 15, 141-165.

Spence, J. T., & Buckner, C. E. (2000). Instrumental and expressive traits, trait stereotypes, and sexist attitudes: What do they signify? *Psychology of Women Quarterly*, 24, 44-62.

Spence, J. T., & Helmreich, R. L. (1978). *Masculinity and femininity: Their psychological dimensions, correlates, and antecedents*. Austin, TX: University of Texas Press.

Spence, J. T., & Helmreich, R. L. (1980). Masculine instrumentality and feminine expressiveness: Their relationships with sex role attitudes and behaviors. *Psychology of Women Quarterly*, 5(2), 147-163.

Spence, J. T., Helmreich, R. L., & Stapp, J. (1975). Ratings of self and peers on sex role attributes and their relation to self-esteem and conceptions of masculinity and femininity. *Journal of Personality and Social Psychology*, 32(1), 29-39.

Sperberg, E. D., & Stabb, S. D. (1998). Depression in women as related to anger and mutuality in relationships. *Psychology of Women Quarterly*, 22, 223-238.

- Sprinkle, S. D., Lurie, D., Insko, S. L., Atkinson, G., Jones, G. L., Logan, A. R., & Bissada, N. N. (2002). Criterion validity, severity cut scores, and test-retest reliability of the Beck Depression Inventory – II in a university counseling center sample. *Journal of Counseling Psychology, 49*(3), 381-385.
- Stice, E., Presnell, K., & Spangler, D. (2002). Risk factors for binge eating onset in adolescent girls: A 2-year prospective investigation. *Health Psychology, 21*(2), 131-138.
- Storch, E. A., Roberti, J. W., & Roth, D. A. (2004). Factor structure, concurrent validity, and internal consistency of the Beck Depression Inventory – Second Edition in a sample of college students. *Depression and Anxiety, 19*, 187-189.
- Struthers, N. J. (1995). Differences in mentoring: A function of gender or organizational rank? *Journal of Social Behavior and Personality, 10*(6), 265-272.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson Education.
- Tantillo, M., & Sanftner, J. (2003). The relationship between perceived mutuality and bulimic symptoms, depression, and therapeutic change in group. *Eating Behaviors, 3*, 349-364.
- Tantillo, M., & Sanftner, J. (2010). Measuring perceived mutuality in women with eating disorders: The development of the Connection-Disconnection Scale. *Journal of Nursing Measurement, 18*, 100–119.
- Taylor, J. M., & Neimeyer, G. J. (2009). Graduate school mentoring in clinical, counselling, and experimental academic training programs: An exploratory study. *Counselling Psychology Quarterly, 22*(2), 257-266.

- Tenenbaum, H. R., Crosby, F. J., Gliner, M. D. (2001). Mentoring relationships in graduate school. *Journal of Vocational Behavior, 59*, 326-341.
- Tong, R. P. (1998). *Feminist thought: A more comprehensive introduction* (2nd ed.). Boulder, Colorado: Westview Press.
- Twenge, J. M. (1997). Changes in masculine and feminine traits over time: A meta-analysis. *Sex Roles, 36*(5/6), 305-325.
- Ülkü-Steiner, B., Kurtz-Costes, B., & Kinlaw, C. R. (2000). Doctoral student experiences in gender-balanced and male-dominated graduate programs. *Journal of Educational Psychology, 92*(2), 296-307.
- Unger, R. K. (1979). Toward a redefinition of sex and gender. *American Psychologist, 34*(11), 1085-1094.
- Wechsler, L. S., Riggs, S. A., Stabb, S. D., & Marshall, D. M. (2006). Mutuality, self-silencing, and disordered eating in college women. *Journal of College Student Psychotherapy, 21*(1), 51-76.
- White, I. R., Royston, P., & Wood, A. M. (2011). Multiple imputation using chained equations: Issues and guidance for practice. *Statistics in Medicine, 30*, 377-399.
- Wilde, J. B., & Schau, C. G. (1991). Mentoring in graduate schools of education: Mentees' perceptions. *Journal of Experimental Education, 59*(2), 165-179.
- Wilson, K. E., Erchul, W. P., & Raven, B. H. (2008). The likelihood of use of social power strategies by school psychologists when consulting with teachers. *Journal of Educational and Psychological Consultation, 18*, 101-123.
- Yoder, J. D., & Kahn, A. S. (1992). Toward a feminist understanding of women and power. *Psychology of Women Quarterly, 16*, 381-388.

Appendix A. Recruitment Notices for Graduate Student Survey

E-mail Version

Dear Graduate Student,

My name is Shannon Gottschall and I am currently completing research for my Ph.D. in the Psychology Department at Carleton University. My study is entitled Mentoring Relationships and Graduate Students' Mental Health and Well-being, and it examines the link between the social functions of the relationships between graduate students and their thesis advisors (such as providing counseling and friendship) and graduate students' mental health or well-being (such as emotional health, self-esteem, life satisfaction). In addition, I will be exploring factors that may affect that link between the student-advisor relationship and student well-being, including factors such as students' biological sex, personality in terms of masculinity/femininity, and the power dynamics of the relationship. I would like to recruit full-time and/or part-time graduate students who have been completing research under the supervision of their current faculty thesis advisor/supervisor for at least six months at a Canadian university (Canadian citizenship not required). Participants would be invited to complete an anonymous thirty-minute online survey with English questions regarding their background, the background of their thesis advisor, the relationship between their thesis advisor and them, and their mental health or well-being. Participants will not be asked to identify themselves and can withdraw from the study at any time without penalty. The study has been approved by the Carleton University Psychology Research Ethics Board – I have attached my approval certificate for your information. [Insert other university's ethics approval certificate information if applicable.]

I will be collecting data for this study between now and [Insert applicable date]. If you are interested in participating, please complete the survey at the following link [Insert applicable www.fluidsurveys.com link]. If you have any questions or concerns, please feel free to contact me (sgottsch@connect.carleton.ca) or my thesis advisor, Dr. Shelley Brown (shelley_brown@carleton.ca).

Thank you for your time,
Shannon Gottschall, Ph.D. Candidate
Carleton University
Ottawa, ON

Online Portal Version

Title of research project: Mentoring relationships and graduate students' mental health and well-being

Brief description of project: This study examines the link between the social functions of the relationships between graduate students and their thesis advisors (such as providing

counseling and friendship) and graduate students' mental health or well-being (such as emotional health, self-esteem, life satisfaction). In addition, this study explores factors that may affect that link between the student-advisor relationship and student well-being, including factors such as students' biological sex, personality in terms of masculinity/femininity, and the power dynamics of the relationship.

Study population: Full-time and/or part-time graduate students who have been completing research under the supervision of their current faculty thesis advisor/supervisor for at least six months at a Canadian university (Canadian citizenship not required).

Role of participants: Participants will be invited to complete an anonymous thirty-minute online survey with English questions regarding their background, the background of their thesis advisor, the relationship between their thesis advisor and them, and their mental health or well-being. Participants will not be asked to identify themselves and can withdraw from the study at any time without penalty.

Location of the study: Online survey

Link to the study's website: [Insert applicable www.fluidsurveys.com link]

Duration of data collection: [Insert applicable date]

Lead(s) on project:

Shannon Gottschall (principal investigator) – sgottsch@connect.carleton.ca

Shelley Brown (faculty sponsor/thesis advisor) – shelley_brown@carleton.ca

**Appendix B. Comparison of Participants Removed from the Graduate Student
Survey Sample and the Remaining Graduate Student Survey Sample**

Table 1

*Descriptive Statistics for Participants Removed from the Graduate Student Survey
Sample and Participants Included in Graduate Student Survey Analyses*

		Eliminated Sample	Remaining Sample
Sex	Male	19 (39.6%)	133 (32.0%)
	Female	29 (60.4%)	283 (68.0%)
Ethnicity	Caucasian	28 (58.3%)	308 (73.2%)
	Arab/West Asian	8 (16.7%)	17 (4.0%)
	South Asian	3 (6.3%)	7 (1.7%)
	African Canadian	2 (4.2%)	4 (1.0%)
	Chinese	2 (4.2%)	14 (3.3%)
	Metis	0 (0.0%)	1 (0.2%)
	South East Asian	0 (0.0%)	2 (0.5%)
	Latin American	0 (0.0%)	12 (2.9%)
	Asiatic	0 (0.0%)	2 (0.5%)
	Filipino	0 (0.0%)	1 (0.2%)
	Aboriginal	0 (0.0%)	2 (0.5%)
	East Indian	0 (0.0%)	5 (1.2%)
	Hispanic	0 (0.0%)	4 (1.0%)
	Other	3 (6.3%)	28 (6.7%)

	Mixed	2 (4.2%)	13 (3.1%)
	Unknown	0 (0.0%)	1 (0.2%)
Degree	Master's	18 (40.0%)	178 (42.4%)
	Doctorate	27 (60.0%)	242 (57.6%)
Faculty	Arts and Social Sciences	19 (42.2%)	188 (45.1%)
	Science	8 (17.8%)	120 (28.8%)
	Engineering and Design	12 (26.7%)	66 (15.8%)
	Public Affairs	6 (13.3%)	38 (9.1%)
	Business	0 (0.0%)	5 (1.2%)
Mean Age (<i>SD</i>)		28.98 (5.70)	29.48 (6.62)

Note. The only significant difference detected between the eliminated and remaining samples was the ethnic composition of each group, but a high proportion of cells with low expected frequencies (i.e., 71.9% of cells had expected frequencies of less than 5) made these statistical results unreliable.

Appendix C. Graduate Student Questionnaire with Student and Thesis Advisor

Background Information

Please provide the following information about yourself, your advisor, and your relationship to the best of your ability:

Your sex: Male Female

Your age:

Your Race/Ethnicity: Arab/West Asian Asiatic
 African/African Canadian Caucasian
 East Indian Hispanic
 Innu Inuit
 Metis Aboriginal
 Chinese Filipino
 Japanese Korean
 Latin American South Asian
 South East Asian Other
 Unknown Mixed

The degree you are currently completing (e.g., Master of Arts):

Your academic program (e.g. Psychology):

Your current amount of funding per academic year through academic sources (i.e., external/internal scholarships, research and teaching assistantships): \$ _____

Your advisor's sex: Male Female

How similar are you to your advisor in terms of your sex and ethnic background (0=you have different sexes and ethnic backgrounds; 1=you have either the same sex or ethnic background; 2=you both have the same sex and ethnic background)?

How similar do you feel to your advisor as a person overall (from 1 or "not at all similar" to 5 or "completely similar")?

How long have you had this advisory relationship with your current academic advisor (1=less than six months; 2=6 months to less than 1 year; 3=between 1 and 2 years; 4= at least 2 years)?

How often do you have individual meetings with your thesis advisor (1=less than once a month; 2=once or twice a month; 3=three or four times a month; 4=more than once a week)?

How often do you have contact with your thesis advisor via e-mail or phone (1=less than once a month; 2=once or twice a month; 3=three or four times a month; 4=more than once a week)?

Your overall level of satisfaction with your relationship with your thesis advisor (from 1 or “not at all satisfied” to 5 or “completely satisfied”):

**Appendix D. Relational Health Indices – Mentor scale (RHI-M; Liang, Tracy,
Taylor, & Williams, 2002b)**

Next to each statement below, please indicate the number that best applies to your relationship with your thesis advisor/mentor.

1=Never; 2=Seldom; 3=Sometimes; 4=Often; 5=Always

1. I can be genuinely myself with my mentor.
2. I believe my mentor values me as a whole person (e.g., professionally/academically and personally).
3. My mentor's commitment to and involvement in our relationship exceeds that required by his/her social/professional role.
4. My mentor shares stories about his/her own experiences with me in a way that enhances my life.
5. I feel as though I know myself better because of my mentor.
6. My mentor gives me emotional support and encouragement.
7. I try to emulate the values of my mentor (such as social, academic, religious, physical/athletic).
8. I feel uplifted and energized by interactions with my mentor.
9. My mentor tries hard to understand my feelings and goals (academic, personal, or whatever is relevant).
10. My relationship with my mentor inspires me to seek other relationships like this one.
11. I feel comfortable expressing my deepest concerns to my mentor.

Appendix E. Personal Attributes Questionnaire (PAQ; Spence & Helmreich, 1978)

Please indicate how well each of these words describes you on a scale from **0 (not at all like me)** to **4 (very much like me)**:

Independent*	0	1	2	3	4
Active*	0	1	2	3	4
Understanding	0	1	2	3	4
Competitive*	0	1	2	3	4
Helpful	0	1	2	3	4
Decisive*	0	1	2	3	4
Aware of feelings	0	1	2	3	4
Never gives up*	0	1	2	3	4
Self-confident*	0	1	2	3	4
Warm	0	1	2	3	4
Feels superior*	0	1	2	3	4
Emotional	0	1	2	3	4
Devotes self	0	1	2	3	4
Gentle	0	1	2	3	4
Kind	0	1	2	3	4
Stands up under pressure*	0	1	2	3	4

* Masculine items

**Appendix F. A Modified Version of the Interpersonal Power Inventory (Raven,
Schwarzwald & Koslowsky, 1998)**

Often thesis supervisors ask students to do their work somewhat differently. Sometimes students resist doing so or do not follow the supervisor's directions exactly. Other times, they will do exactly as their supervisor requests. We are interested in those situations which lead students to follow the requests of their supervisor.

Think about a time when you were being supervised in doing your work. Suppose your thesis supervisor asked you to do your work somewhat differently and, though you were initially reluctant, you did exactly as you were asked. On the following pages, there are a number of reasons why you might do so. Read each descriptive statement carefully, thinking of the situation in which you were supervised. Decide how likely it would be that this would be the reason you would comply and indicate this on a scale from 1 (definitely not a reason) to 7 (definitely a reason).

A good evaluation from my thesis supervisor could lead to increased funding. (RI)

After all, he/she was my thesis supervisor. (L/P)

My thesis supervisor probably knew the best way to do the job. (E)

Once it was pointed out, I could see why the change was necessary. (I)

I respected my thesis supervisor and thought highly of him/her and did not wish to disagree. (R)

I liked my thesis supervisor and his/her approval was important to me. (PR)

By doing so, I could make up for some problems I may have caused in the past. (L/E)

For past considerations I had received, I felt obliged to comply. (L/R)

My thesis supervisor could make things unpleasant for me. (CI)

I saw my thesis supervisor as someone I could identify with. (R)

Unless I did so, his/her job would be more difficult. (L/D)

It would have been disturbing to know that my thesis supervisor disapproved of me. (PC)

My thesis supervisor probably knew more about the work than I did. (E)

Complying helped make up for things I had not done so well previously. (L/E)

My thesis supervisor could help me receive special benefits. (RI)

My thesis supervisor may have been cold and distant if I did not do as requested. (PC)

My thesis supervisor gave me good reasons for changing how I did the work. (I)

I understood that my thesis supervisor really needed my help on this. (L/D)

My thesis supervisor had the right to request that I do my work in a particular way. (L/P)

My thesis supervisor made me feel more valued when I did as requested. (PR)

I had made some mistakes and therefore felt that I owed this to him/her. (L/E)

My thesis supervisor could make it more difficult for me to get ahead in my degree and/or career. (CI)

My thesis supervisor had previously done some good things that I had requested. (L/R)

It made me feel personally accepted when I did as my thesis supervisor asked. (PR)

As a student, I had an obligation to do as my thesis supervisor said. (L/P)

I looked up to my thesis supervisor and generally modeled my work accordingly. (R)

My thesis supervisor's actions could help me get ahead in my degree and/or career. (RI)

My thesis supervisor probably had more technical knowledge about this than I did. (E)

My thesis supervisor could make it more difficult for me to get increased funding. (CI)

I realized that a thesis supervisor needs assistance and cooperation from those working with him/her. (L/D)

I could then understand why the recommended change was for the better. (I)

My thesis supervisor had let me have my way earlier so I felt obliged to comply now. (L/R)

Just knowing that I was on the bad side of my thesis supervisor would have upset me. (PC)

Note: RI=Reward Impersonal Power items; CI=Coercive Impersonal Power items; E=Expert Power items; R=Referent Power items; I=Informational Power items; L/P=Legitimacy/Position Power items; L/R=Legitimacy/Reciprocity Power items; L/D=Legitimacy/Dependence Power items; L/E=Legitimacy/Equity Power items; PR=Personal Reward Power items; PC=Personal Coercion Power items

Appendix G. The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985)

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item. Please be open and honest in your responding. The 7-point scale is: 1=strongly disagree, 2=disagree, 3=slightly disagree, 4=neither agree nor disagree, 5=slightly agree, 6=agree, 7=strongly agree.

In most ways my life is close to my ideal.

The conditions of my life are excellent.

I am satisfied with my life.

So far I have gotten the important things I want in life.

If I could live my life over, I would change almost nothing.

Appendix H. Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965)

Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

- | | | | | |
|---|----|---|---|----|
| 1. On the whole, I am satisfied with myself. | SA | A | D | SD |
| 2. At times, I think I am no good at all.* | SA | A | D | SD |
| 3. I feel that I have a number of good qualities. | SA | A | D | SD |
| 4. I am able to do things as well as most other people. | SA | A | D | SD |
| 5. I feel I do not have much to be proud of.* | SA | A | D | SD |
| 6. I certainly feel useless at times.* | SA | A | D | SD |
| 7. I feel that I'm a person of worth, at least on an equal plane with others. | SA | A | D | SD |
| 8. I wish I could have more respect for myself.* | SA | A | D | SD |
| 9. All in all, I am inclined to feel that I am a failure.* | SA | A | D | SD |
| 10. I take a positive attitude toward myself. | SA | A | D | SD |

*reverse-coded

Appendix I. Graduate Student Survey Informed Consent

The purpose of an informed consent form is to ensure that you understand the purpose of the study and the nature of your involvement. The informed consent form must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

Present study: Mentoring Relationships and Graduate Students' Mental Health and Well-being

Research personnel: The following people are involved in this research project and may be contacted at any time if you have questions or concerns: Shannon Gottschall (Principal Investigator; sgottsch@connect.carleton.ca), Dr. Shelley Brown (Faculty Sponsor; 613-520-2600, ext. 1505; shelley_brown@carleton.ca). Should you have any ethical concerns about this study, please contact Dr. Avi Parush (Chair, Research Ethics Board, 613-520-2600 ext.6026, avi_parush@carleton.ca). Should you have any other concerns about this study then please contact Dr. Anne Bowker (Chair of the Department of Psychology; psychchair@carleton.ca; 613-520-2600, ext. 8218).

Purpose: The purpose of this study is learning about the association between the quality of the relationship between graduate students and their thesis advisors/supervisors and graduate students' mental health or well-being. More specifically, we are interested in how different factors (e.g., demographics, personality in terms of traditional masculinity/femininity, power dynamics within the relationship) affect the association between the social functions of the relationship (such as friendship, providing advice) and mental health or well-being of the student (such as emotional health, self-esteem, life satisfaction).

Task requirements and duration: Should you choose to participate in the study, you will be asked to participate in a 30 minute session to answer questions about your background, your thesis supervisor's background, your relationship with your supervisor, and your mental health or well-being (such as emotional health, self-esteem, life satisfaction).

Potential risk/discomfort and right to withdraw: There are no physical risks to participating in this study. However, due to the fact that you will be asked questions about your relationship with your thesis supervisor and your well-being and mental health, there is a possibility that you will experience some degree of anxiety, pain or embarrassment. Please be reminded that your participation is entirely voluntary, that you may choose not to answer any question, and that you may withdraw from the study at any time without penalty if any part of it makes you feel uncomfortable.

Anonymity: Your answers will be anonymous. You will not be asked to identify yourself in the survey. Your responses will be anonymous and any reports resulting from this study will not identify any participants.

Clearance: This study has received clearance by the Carleton University Psychology Research Ethics Board [Insert applicable reference number]. [Insert reference number for other university Research Ethics Board if applicable.]

Consent

I have read the above form and understand the conditions of my participation. My participation in this study is voluntary, and if for any reason, at any time, I wish to leave the experiment I may do so without having to give an explanation and with no penalty whatsoever. Furthermore, I am also aware that the data gathered in this study are anonymous. By proceeding to answer the questions on the next page, I am indicating that I agree to participate in this study.

- I agree and will continue to the next page to participate.
- I do not agree and will not continue to the next page to participate.

Appendix J. Graduate Student Survey Debriefing: Standard and Enhanced Versions

Standard Version

What are we trying to learn in this research?

This research examined the link between the social functions of relationships between graduate students and thesis advisors (such as providing counseling and friendship), and graduate students' mental health or well-being (such as emotional health, self-esteem, life satisfaction). In addition, factors that may affect the link between the functions of the relationship and student well-being were explored. In addition to basic background information on you, your supervisor and your relationship, the questionnaires you completed measured the social functioning of your relationship with your thesis advisor and your mental health and well-being, as well as those factors that may affect the link between the functions of the relationship and your mental health – sex, personality in terms of traditional masculinity/femininity, and power dynamics within the relationship.

What are our hypotheses/predictions?

We hypothesized that better social functioning within your relationship with your thesis supervisor would be linked to better mental health or well-being for you as a student. We further hypothesized that individuals' biological sex, feminine/masculine characteristics, and power within the relationship would influence the strength of the association between the social functioning of the relationship and students' mental health and well-being. More specifically, we predicted that women, individuals describing themselves as more feminine, and those with less power in the relationship would have the strongest associations between social functioning of the student-advisor relationship and student mental health or well-being.

Why is this important to researchers and the general public?

Research has suggested the importance of mentoring relationships to students' outcomes in graduate school, including mental health and degree completion rates. The current study was designed to examine factors influencing that association. Understanding these factors may help to improve the quality of mentoring relationships and subsequent student outcomes.

Where can I learn more?

If you are interested in learning about mentoring relationships and student outcomes, see Peluso, D. L., Carleton, R. N., & Asmundson, G. J. G. (2011). Depression symptoms in Canadian psychology graduate students: Do research productivity, funding, and the academic advisory relationship play a role? *Canadian Journal of Behavioural Science*, 43(2), 119-127. If you are interested in relational-cultural theory, which suggests the importance of sex and gender identity to relationship styles and the importance of the quality of relationships to mental health, see Jordan, J. V., Kaplan, A. G., Miller, J. B., Stiver, I.P., & Surrey, J. L. (1991). *Women's Growth in Connection: Writings from the Stone Center*. New York: Guilford Press.

If you have questions...

In the event that you have any concerns about this study, or anything you wish to discuss further please use these contacts. For questions or concerns about the study, you may contact Shannon Gottschall (Principal Investigator; sgottsch@connect.carleton.ca), Dr. Shelley Brown (Faculty Sponsor; 613-520-2600, ext. 1505; shelley_brown@carleton.ca). Should you have any ethical concerns about this study, please contact Dr. Avi Parush (Chair, Research Ethics Board, 613-520-2600 ext.6026, avi_parush@carleton.ca). Should you have any other concerns about this study then please contact Dr. Anne Bowker (Chair of the Department of Psychology; psychchair@carleton.ca; 613-520-2600, ext. 8218).

If you are feeling distressed...

If participating in this study has upset you in any way you may wish to speak to someone. If so, you can contact any of the following:

Mental Health Crisis Line: within Ottawa (613) 722-6914, outside Ottawa 1-866-996-0991, Web Site: <http://www.crisisline.ca/>

Ottawa Distress Centre: (613) 238 1089, Web Site: www.dcottawa.on.ca

Distress Centre of Toronto: (416) 408 HELP

Distress Centre of Hamilton: (905) 525-8611

Hospital Directories:**Alberta:**

<http://www.health.alberta.ca/>

<http://www.fsnhospitals.com/Canada-Hospitals/Alberta-Hospitals/>

British Columbia:

<http://www.health.gov.bc.ca/socsec/pdf/hospitallist.pdf>

<http://www.fsnhospitals.com/Canada-Hospitals/British-Columbia-Hospitals/>

Saskatchewan:

<http://www.fsnhospitals.com/Canada-Hospitals/Saskatchewan-Hospitals/Saskatoon-Hospitals/>

Manitoba:

<http://www.hospital-directory.info/hospitals-manitoba>

<http://www.fsnhospitals.com/Canada-Hospitals/Manitoba-Hospitals/>

Ontario:

http://www.health.gov.on.ca/english/public/contact/hosp/hosploc_mn.html

<http://www.fsnhospitals.com/Canada-Hospitals/Ontario-Hospitals/>

Quebec:

<http://www.fsnhospitals.com/Canada-Hospitals/Quebec-Hospitals/Quebec-Hospitals/>

New Brunswick:

<http://nb.finditincanada.ca/app/search/cat-12014>

<http://www.fsnhospitals.com/Canada-Hospitals/New-Brunswick-Hospitals/>

Nova Scotia:

<http://www.fsnhospitals.com/Canada-Hospitals/Nova-Scotia-Hospitals/>

Prince Edward Island:

<http://www.fsnhospitals.com/Canada-Hospitals/Prince-Edward-Island-Hospitals/>

Newfoundland:

<http://www.fsnhospitals.com/Canada-Hospitals/Newfoundland-Hospitals/>

Yukon :

<http://www.fsnhospitals.com/Canada-Hospitals/Yukon-Territory-Hospitals/>

Nunavut :

www.yellowpages.ca

Northwest Territories:

<http://www.fsnhospitals.com/Canada-Hospitals/Northwest-Territory-Hospitals/>

For more information on Canadian crisis centres and distress line numbers in your local area, please see the Canadian Association for Suicide Prevention website at <http://www.suicideprevention.ca/in-crisis-now/find-a-crisis-centre-now/crisis-centres/>.

Thank you for participating!

Enhanced Version for Students Reporting Depression and/or Suicidal Thoughts

What are we trying to learn in this research?

This research examined the link between the social functions of relationships between graduate students and thesis advisors (such as providing counseling and friendship), and graduate students' mental health or well-being (such as emotional health, self-esteem, life satisfaction). In addition, factors that may affect the link between the functions of the relationship and student well-being were explored. In addition to basic background information on you, your supervisor and your relationship, the questionnaires you completed measured the social functioning of your relationship with your thesis advisor and your mental health and well-being, as well as those factors that may affect the link between the functions of the relationship and your mental health – sex, personality in terms of traditional masculinity/femininity, and power dynamics within the relationship.

What are our hypotheses/predictions?

We hypothesized that better social functioning within your relationship with your thesis supervisor would be linked to better mental health or well-being for you as a student. We further hypothesized that individuals' biological sex, feminine/masculine characteristics, and power within the relationship would influence the strength of the association between the social functioning of the relationship and students' mental health and well-being. More specifically, we predicted that women, individuals describing themselves as more feminine, and those with less power in the relationship would have the strongest associations between social functioning of the student-advisor relationship and student mental health or well-being.

Why is this important to researchers and the general public?

Research has suggested the importance of mentoring relationships to students' outcomes in graduate school, including mental health and degree completion rates. The current study was designed to examine factors influencing that association. Understanding these factors may help to improve the quality of mentoring relationships and subsequent student outcomes.

Where can I learn more?

If you are interested in learning about mentoring relationships and student outcomes, see Peluso, D. L., Carleton, R. N., & Asmundson, G. J. G. (2011). Depression symptoms in Canadian psychology graduate students: Do research productivity, funding, and the academic advisory relationship play a role? *Canadian Journal of Behavioural Science*, 43(2), 119-127. If you are interested in relational-cultural theory, which suggests the importance of sex and gender identity to relationship styles and the importance of the quality of relationships to mental health, see Jordan, J. V., Kaplan, A. G., Miller, J. B., Stiver, I.P., & Surrey, J. L. (1991). *Women's Growth in Connection: Writings from the Stone Center*. New York: Guilford Press.

If you have questions...

In the event that you have any concerns about this study, or anything you wish to discuss further please use these contacts. For questions or concerns about the study, you may contact Shannon Gottschall (Principal Investigator; sgottsch@connect.carleton.ca), Dr. Shelley Brown (Faculty Sponsor; 613-520-2600, ext. 1505; shelley_brown@carleton.ca). Should you have any ethical concerns about this study, please contact Dr. Avi Parush (Chair, Research Ethics Board, 613-520-2600 ext.6026, avi_parush@carleton.ca). Should you have any other concerns about this study then please contact Dr. Anne Bowker (Chair of the Department of Psychology; psychchair@carleton.ca; 613-520-2600, ext. 8218).

If you are feeling distressed...

Depression is a condition that can occur for many reasons, including workplace, school, or relationship stressors, traumatic life events, discrimination, as well as physical/biological imbalances.

Approximately 10-15% of people will suffer some degree of depression during their lifetime. With advances in modern medicine, most people can readily be treated for this illness, which if unattended can be long lasting and affect many aspects of one's life. The symptoms of depression comprise:

- Poor or depressed mood, or a reduction in the pleasure gained from otherwise positive experiences
- Sleep disturbances
- Eating disturbances (loss of appetite, or overeating despite not being hungry), which may be linked to weight changes
- Lack of sexual interest
- Fatigue and lethargy (you don't feel like doing anything)
- An inability to focus (e.g., you have a hard time reading)
- Reduced interactions with family and friends
- Thoughts of suicide

Someone who is depressed may experience several (3-4), but not necessarily all of the above symptoms.

It is likewise the case that 60% of individuals will encounter a severe traumatic event in their lives and of these people, a fair number will develop symptoms that cause severe anxiety. Illnesses of this nature, including posttraumatic stress disorder (PTSD) can be treated. Once again, if unattended, the repercussions can be severe. Symptoms include:

- Hyperarousal (e.g., feelings of anxiety and reactivity even to minor situations)
- Intrusive thoughts (memories of the event come into your head frequently)
- Avoiding thoughts or stimuli related to the event

These symptoms can persist for more than a month following the event, and influence your day-to-day functioning.

Your responses to this survey suggest that you may be experiencing one of the above. If you are not already receiving attention for this problem, it is suggested that you contact your family physician. It is not a good idea to allow problems to fester, as ruminating

over these problems will typically not make them go away. Your family physician or counselor will usually be able to help you or to refer you to someone who can. If you do not have a family physician, then you can contact any of the following:

Mental Health Crisis Line: within Ottawa (613) 722-6914, outside Ottawa 1-866-996-0991, Web Site: <http://www.crisisline.ca/>

Ottawa Distress Centre: (613) 238 1089, Web Site: www.dcottawa.on.ca

Distress Centre of Toronto: (416) 408 HELP

Distress Centre of Hamilton: (905) 525-8611

Hospital Directories:

Alberta:

<http://www.health.alberta.ca/>

<http://www.fsnhospitals.com/Canada-Hospitals/Alberta-Hospitals/>

British Columbia:

<http://www.health.gov.bc.ca/socsec/pdf/hospitallist.pdf>

<http://www.fsnhospitals.com/Canada-Hospitals/British-Columbia-Hospitals/>

Saskatchewan:

<http://www.fsnhospitals.com/Canada-Hospitals/Saskatchewan-Hospitals/Saskatoon-Hospitals/>

Manitoba:

<http://www.hospital-directory.info/hospitals-manitoba>

<http://www.fsnhospitals.com/Canada-Hospitals/Manitoba-Hospitals/>

Ontario:

http://www.health.gov.on.ca/english/public/contact/hosp/hosploc_mn.html

<http://www.fsnhospitals.com/Canada-Hospitals/Ontario-Hospitals/>

Quebec:

<http://www.fsnhospitals.com/Canada-Hospitals/Quebec-Hospitals/Quebec-Hospitals/>

New Brunswick:

<http://nb.finditincanada.ca/app/search/cat-12014>
<http://www.fsnhospitals.com/Canada-Hospitals/New-Brunswick-Hospitals/>

Nova Scotia:

<http://www.fsnhospitals.com/Canada-Hospitals/Nova-Scotia-Hospitals/>

Prince Edward Island:

<http://www.fsnhospitals.com/Canada-Hospitals/Prince-Edward-Island-Hospitals/>

Newfoundland:

<http://www.fsnhospitals.com/Canada-Hospitals/Newfoundland-Hospitals/>

Yukon :

<http://www.fsnhospitals.com/Canada-Hospitals/Yukon-Territory-Hospitals/>

Nunavut :

www.yellowpages.ca

Northwest Territories:

<http://www.fsnhospitals.com/Canada-Hospitals/Northwest-Territory-Hospitals/>

For more information on Canadian crisis centres and distress line numbers in your local area, please see the Canadian Association for Suicide Prevention website at <http://www.suicideprevention.ca/in-crisis-now/find-a-crisis-centre-now/crisis-centres/>.

Thank you for participating!

**Appendix K. Graduate Student Survey Covariate Partial Correlations with
Psychological Health Outcomes**

Table 1

Graduate Student Survey Mentoring Background Partial Correlations with Psychological Health Outcomes

Covariate	Correlation After Partialling Out Other Covariates		
	BDI-II	RSES	SWLS
Funding	-.10	.02	.05
Student-mentor similarity in sex/ethnicity	-.02	-.00	.04
Student-mentor similarity overall	-.02	.06	.06
Length of relationship	-.01	.04	-.05
Relationship satisfaction	-.23***	.21***	.23***
Degree of contact	-.03	.03	.08

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

Note. BDI-II = Beck Depression Inventory – II; RSES = Rosenberg Self-Esteem Scale; SWLS = Satisfaction With Life Scale

Appendix L. Original Experimental Power Manipulation

Professor Condition

Participants are first asked to imagine themselves as a professor in the following scenario.

Imagine yourself in the role of a professor who is supervising a student as they complete a thesis or major research project. As a thesis supervisor, it is your responsibility to help the student in defining his/her thesis topic, and to help the student in understanding their research and results. It is your responsibility to meet with the student to provide this assistance and to provide feedback on their work. You expect the student to consider your feedback and you are able to end the relationship with the student if the student is not completing their work to your satisfaction or listening to your advice and guidance. It is also your responsibility to write letters of reference for your student if he/she is applying for scholarships, or you should let your student know if you are unwilling to provide a positive reference.

Participants are then asked to read the following student role description.

It is your student's responsibility to choose a topic approved by you and to hand their work in to you within agreed-upon deadlines. Your student can expect assistance and guidance from you in understanding their research and understanding what is required from them as a student. Students should consider your feedback and should make sure they are well prepared for meetings with you.

Each participant is now asked to imagine him/herself as a professor interviewing a potential thesis student for the first time.

Please imagine that you are a professor interviewing a potential thesis student who is interested in your area of research. Your student is interested in research on the rehabilitation of child soldiers. He/she has previous work experience providing support to victims of crime through a non-profit organization. He/she is single but has an active social life. He/she travels frequently and vacationed in Ecuador last year. He/she speaks both English and French fluently. He/she was born and raised in Halifax, Nova Scotia. He/she plays the saxophone in a local jazz quartet. He/she is a vegetarian and enjoys cooking vegetarian dishes. He/she enjoys working with others and always contributes to joint work. He/she has been recognized through multiple financial awards from the university. He/she is very punctual to meetings. He/she always meets academic deadlines.

Student Condition

Each participant is asked to imagine him/herself as a student in the following scenario.

Imagine yourself in the role of a student completing a thesis or major research project under the supervision of a professor. As a student, it is your responsibility to choose a topic approved by your thesis supervisor (the professor) and to hand your work in to your supervisor within agreed-upon deadlines. You can expect assistance and guidance from your supervisor in understanding your research and understanding what is required from you as a student. You should consider the feedback given by your supervisor and should make sure you are well prepared for meetings with your supervisor.

Participants are then asked to read the following professor role description.

It is your professor's responsibility to help you define your thesis topic, and to help you understand your research and results. It is your professor's responsibility to meet with you to provide this assistance and to provide feedback on your work. Your professor expects you to consider his/her feedback and your professor is able to end your relationship if you are not completing your work to his/her satisfaction or listening to his/her advice and guidance. It is also your professor's responsibility to write letters of reference for you if you are applying for scholarships, or your professor should let you know if he/she is unwilling to provide a positive reference.

Now, each participant in the student condition will be asked to imagine him/herself in the following scenario.

Please imagine yourself as a student just starting a thesis or major research project under the supervision of a professor. Please imagine yourself meeting that professor for the first time. Your supervisor is interested in research on the rehabilitation of child soldiers. He/she has previous work experience providing support to victims of crime through a non-profit organization. He/she is single but has an active social life. He/she travels frequently and vacationed in Ecuador last year. He/she speaks both English and French fluently. He/she was born and raised in Halifax, Nova Scotia. He/she plays the saxophone in a local jazz quartet. He/she is a vegetarian and enjoys cooking vegetarian dishes. He/she enjoys working with others and always contributes to joint work. He/she has been recognized through multiple financial awards from the university. He/she is very punctual to meetings. He/she always meets academic deadlines.

Appendix M. Original Experimental Power Manipulation Check**Modified Version of Power Manipulation Check by Haines & Kray (2005)****Professor Version**

To what extent do you feel that your role as a thesis supervisor/professor and the student's role are equally balanced in terms of power? Please answer this on a scale from 0 to 100 where 0 indicates the student has more power, 50 indicates you both have equal power, and 100 indicates you have more power as a thesis supervisor.

Student Version

To what extent do you feel that your role as a student and your thesis supervisor's/professor's role are equally balanced in terms of power? Please answer this on a scale from 0 to 100 where 0 indicates your thesis supervisor has more power, 50 indicates you both have equal power, and 100 indicates you have more power as a student.

Appendix N. Experiment Demographic Questionnaire

Please provide the following information about yourself:

Sex (Please circle one): male female

Age (years): _____

Race/Ethnicity (Please circle one of the following categories):

Arab/West Asian

Asiatic

African/African Canadian

Caucasian

East Indian

Hispanic

Innu

Inuit

Metis

Aboriginal

Chinese

Filipino

Japanese

Korean

Latin American

South Asian

South East Asian

Other

Unknown

Academic program (e.g., psychology): _____

**Appendix O. Modified Mutual Psychological Development Questionnaire (MPDQ;
Genero, Miller, Surrey, & Baldwin, 1992)**

Professor Version

Please rate the following items based on how you would anticipate interacting with your student using the following scale: 1=Never; 2=Rarely; 3=Occasionally; 4=More often than not; 5=Most of the time; 6=All the time.

When we talk about things that matter to my student, I will be likely to...

1. Be receptive.
2. Get impatient.*
3. Try to understand.
4. Feel moved.
5. Avoid being honest.*
6. Get discouraged.*
7. Have difficulty listening.*
8. Get involved.
9. Feel energized.
10. Get bored.*
11. Keep an open mind.
12. Pick up on his/her feelings.
13. Feel like we're not getting anywhere.*
14. Show an interest.
15. Get frustrated.*
16. Change the subject.*
17. Share similar experiences.
18. Keep feelings inside.*
19. Respect his/her point of view.
20. See the humour in things.
21. Feel down.*
22. Express an opinion clearly.

Student Version

Please rate the following items based on how you would anticipate interacting with your professor using the following scale: 1=Never; 2=Rarely; 3=Occasionally; 4=More often than not; 5=Most of the time; 6=All the time.

When we talk about things that matter to my professor, I will be likely to...

1. Be receptive.
2. Get impatient.*

3. Try to understand.
4. Feel moved.
5. Avoid being honest.*
6. Get discouraged.*
7. Have difficulty listening.*
8. Get involved.
9. Feel energized.
10. Get bored.*
11. Keep an open mind.
12. Pick up on his/her feelings.
13. Feel like we're not getting anywhere.*
14. Show an interest.
15. Get frustrated.*
16. Change the subject.*
17. Share similar experiences.
18. Keep feelings inside.*
19. Respect his/her point of view.
20. See the humour in things.
21. Feel down.*
22. Express an opinion clearly.

* reverse-coded

Appendix P. Experimental Recall Question**Student Condition**

Please use the space below to describe your professor based on the information that you read at the beginning of the experiment. Please include as much detail as you can remember.

Professor Condition

Please use the space below to describe your student based on the information that you read at the beginning of the experiment. Please include as much detail as you can remember.

Appendix Q. Experiment Recall Task Coding Scheme

Any reference to each of these professional *items* (in whole or in part) counts as 1 point toward the professional item total:

- interested in research on the rehabilitation of child soldiers
- previous work experience providing support to victims of crime through a non-profit organization
- enjoys working with others and always contributes to joint work
- has been recognized through multiple financial awards from the university
- is very punctual to meetings
- always meets academic deadlines

Any reference to each of these *personal items* (in whole or in part) counts as 1 point toward the personal item total:

- single but has an active social life
- travels frequently and vacationed in Ecuador last year
- speaks both English and French fluently
- born and raised in Halifax, Nova Scotia
- plays the saxophone in a local jazz quartet
- is a vegetarian and enjoys cooking vegetarian dishes

Appendix R. Experiment Recruitment Notice

Study Name: Relationship Styles in Mentoring

Description: The primary goal of this study is to examine relationship styles within mentoring relationships between students and professors working together on research. Participants will be required to come to the lab in person. Experience completing research under the supervision of a professor is not required.

Eligibility Requirements: None

Duration and Locale: 30 minutes, location TBD

Compensation: Participants will receive 0.5% towards a psychology course (PSYC 1001, 1002) for this experiment.

Researchers: Shannon Gottschall (Principal Investigator); Dr. Shelley Brown (Faculty Sponsor)

E-mail: sgottsch@connect.carleton.ca

This study has received clearance by the Carleton University Psychology Research Ethics Board [Insert applicable reference number].

Appendix S. Experiment Informed Consent

The purpose of an informed consent form is to ensure that you understand the purpose of the study and the nature of your involvement. The informed consent form must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

Present study: Relationship Styles in Mentoring

Research personnel: The following people are involved in this research project and may be contacted at any time if you have questions or concerns: Shannon Gottschall (Principal Investigator; sgottsch@connect.carleton.ca), Dr. Shelley Brown (Faculty Sponsor; 613-520-2600, ext. 1505; shelley_brown@carleton.ca). Should you have any ethical concerns about this study then please contact Dr. Monique Sénéchal (Chair of the Carleton University Ethics Committee for Psychological Research; monique_senechal@carleton.ca; 613-520-2600, ext. 1155). Should you have any other concerns about this study then please contact Dr. Anne Bowker (Chair of the Department of Psychology; psychchair@carleton.ca; 613-520-2600, ext. 8218).

Purpose: The purpose of this study is to examine relationship styles within mentoring relationships between students and professors working together on research. More specifically, we are interested in how different factors (e.g., sex, personal characteristics such as femininity/masculinity, one's role within the relationship) affect one's relationship style (i.e., how you would interact with the other person in the relationship).

Task requirements and duration: Should you choose to participate in the study, you will be asked to participate in a 30 minute session to read about your role and the person you would be interacting with, and then answer questions about how you would describe yourself, how you would describe the person you will be interacting with, and how you would anticipate interacting with them.

Potential risk/discomfort and right to withdraw: There are no physical risks to participating in this study. However, due to the fact that you will be asked questions about yourself (including your femininity/masculinity) and anticipate interacting with others, there is a possibility that you will experience some degree of anxiety, pain or embarrassment. Please be reminded that your participation is entirely voluntary, that you may choose not to answer any question, and that you may withdraw from the study at any time without penalty if any part of it makes you feel uncomfortable. On-campus counselling is available through Carleton University Health and Counselling Services, 613-520-6674. The Distress Centre of Ottawa and Region (613-238-3311) may also be of help.

Anonymity/confidentiality: Your answers will be stored anonymously (i.e., with only a participant number associated with responses and not your name). This informed consent form with your name will not be linked to your responses in any way and will be stored separately from your responses.

Clearance: This study has received clearance by the Carleton University Psychology Research Ethics Board [Insert applicable reference number].

Consent

I have read the above form and understand the conditions of my participation. My participation in this study is voluntary, and if for any reason, at any time, I wish to leave the experiment I may do so without having to give an explanation and with no penalty whatsoever. Furthermore, I am also aware that the data gathered in this study are confidential and anonymous with respect to my personal identity. My signature indicates that I agree to participate in this study.

Participant's Name: _____

Participant's Signature: _____

Researcher's Name: _____

Researcher's Signature: _____

Date: _____

Appendix T. Original Experiment Debriefing

What are we trying to learn in this research?

This study aims to examine factors influencing relationship styles individuals adopt within mentoring relationships. The questionnaires you completed measured your sex, your gender identity (i.e., how traditionally masculine/feminine you describe yourself), and your anticipated relationship style within a mentoring relationship. Your description of your partner in this relationship (either your thesis advisor if you took on the role of a student, or your student if you took on the role of a thesis advisor) was also used to assess your relationship style based on how many personal details you included in the description; this was intended to measure how personally involved and close you would become to your partner in this relationship. Your role (as either a student or advisor), your sex, and your gender identity are the three factors that will be examined to see their influence on relationship styles within mentoring relationships.

What are our hypotheses/predictions?

We hypothesize that individuals' biological sex, feminine/masculine characteristics, and role (either as a student or advisor) will influence individuals' relationship styles within the mentoring relationship. More specifically, we predict that women, individuals describing themselves as more feminine, and those in the role of students would be most likely to anticipate adopting a closer, more intimate and personal relationship style.

Why is this important to researchers and the general public?

Research has suggested the importance of mentoring relationships to students' outcomes in graduate school, including mental health and degree completion rates. The current study was designed to examine factors influencing the quality of the mentoring relationship. Understanding these factors may help to improve the quality of mentoring relationships and subsequent student outcomes.

Where can I learn more?

If you are interested in learning about mentoring relationships and student outcomes, see Peluso, D. L., Carleton, R. N., & Asmundson, G. J. G. (2011). Depression symptoms in Canadian psychology graduate students: Do research productivity, funding, and the academic advisory relationship play a role? *Canadian Journal of Behavioural Science*, 43(2), 119-127. If you are interested in relational-cultural theory, which suggests the importance of sex and gender identity to relationship styles, see Jordan, J. V., Kaplan, A. G., Miller, J. B., Stiver, I.P., & Surrey, J. L. (1991). *Women's Growth in Connection: Writings from the Stone Center*. New York: Guilford Press.

If you have questions...

In the event that you have any concerns about this study, or anything you wish to discuss further please use these contacts. For questions or concerns about the study, you may contact Shannon Gottschall (Principal Investigator; sgottsch@connect.carleton.ca), Dr. Shelley Brown (Faculty Sponsor; 613-520-2600, ext. 1505; shelley_brown@carleton.ca). Should you have any ethical concerns about this study then please contact Dr. Monique Sénéchal (Chair of the Carleton University Ethics Committee for Psychological Research; monique_senechal@carleton.ca; 613-520-2600, ext. 1155). Should you have any other concerns about this study then please contact Dr. Anne Bowker (Chair of the Department of Psychology; psychchair@carleton.ca; 613-520-2600, ext. 8218).

If you are feeling distressed...

If participating in this study has upset you in any way you may wish to speak to someone. On-campus counselling is available through Carleton University Health and Counselling Services, 613-520-6674. The Distress Centre of Ottawa and Region (613-238-3311) may also be of help.

Thank you for participating!

Appendix U. Revised Experimental Power Manipulation

Professor Condition

Participants are asked to imagine themselves as a professor in the following scenario.

Imagine yourself in the role of a professor who is supervising a student as they complete a thesis or major research project. This student will be one of several students completing research that matches your research interests and research goals. You will determine how work is distributed among your students in your laboratory and who will be allowed to work on the best projects. You will also have funds available for this work in your laboratory and you will decide who will receive this money. You have the power to require your student to provide unpaid work in your laboratory unrelated to their thesis or major research project. You will hold meetings, during which your student will report to you on his/her progress and you will determine whether this progress is satisfactory. You will provide feedback on your student's work and you expect your student to follow your feedback. You have the power to end the relationship with the student if the student is not completing his/her work to your satisfaction or is not following your feedback. You will evaluate your student's work and determine whether it is acceptable to be submitted to the department – your approval is needed in order for your student to complete his/her degree. Waiting for your approval may delay his/her graduation, depending on how quickly you review his/her work. Your evaluations of your student's work will also be critically important to your student's applications for jobs, scholarships, and other schools because you will likely be listed as a reference in these applications (and students are often required to include you as a reference).

Student Condition

Participants are asked to imagine themselves as a student in the following scenario.

Imagine yourself in the role of a student completing a thesis or major research project under the supervision of a professor. You will be one of several students completing work that matches your supervisor's research interests and goals. Your supervisor decides how work is distributed among you and your fellow students in the research laboratory and which students will be allowed to work on the best projects. Your supervisor will also have funds available for this work in his/her laboratory and your supervisor will decide which students will receive this money. Your supervisor has the power to require you to provide unpaid work in the laboratory unrelated to your thesis or major research project. You will be required to attend meetings with your supervisor, during which you need to report on your progress. You will need to be prepared for these meetings and your supervisor will judge whether your progress has been satisfactory. Your professor will evaluate your work and will give you feedback. You will be expected to follow this feedback. If your supervisor is dissatisfied with your progress or if you do not follow his/her feedback, your supervisor has the power to end your supervisory relationship. Your supervisor will evaluate your work and determine

whether it is acceptable to be submitted to the department – you need your supervisor's permission in order to complete your degree. Waiting for your supervisor's approval may delay your graduation, depending on how quickly he/she reviews your work. Your supervisor's approval of your work will also be critically important to your future applications for jobs, scholarships and other schools because your supervisor will likely be a reference for these applications (and you are often required to include your thesis supervisor as a reference).

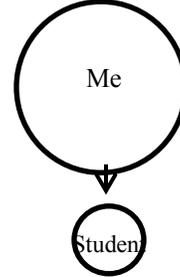
Appendix V. Revised Experimental Power Manipulation Check

Modified Version of Neff and Harter's (2002) Power Measure

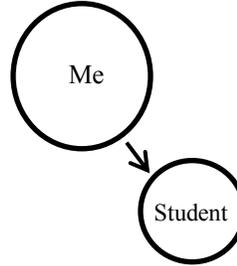
Professor Version

Please answer the following question about your role as a professor using the five-point scale below: Who has the most power – you or your student?

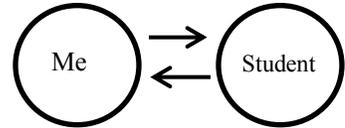
1) I definitely have the most power in the relationship.



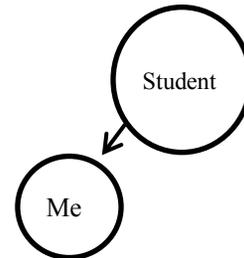
2) I often have more power in the relationship.



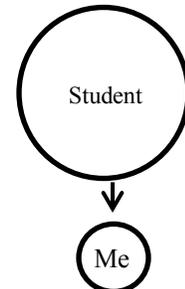
3) My student and I have equal power in the relationship.



4) My student often has more power in the relationship.



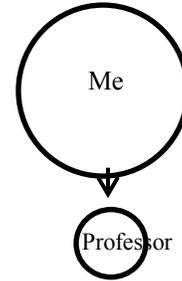
5) My student definitely has the most power in the relationship.



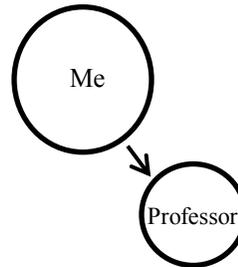
Student Version

Please answer the following question about your role as a student using the five-point scale below: Who has the most power – you or your professor?

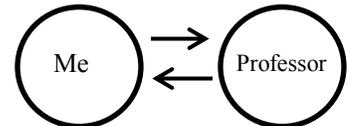
- 1) I definitely have the most power in the relationship.



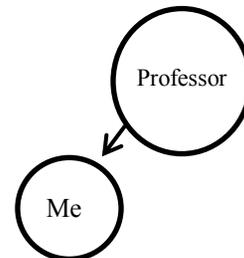
- 2) I often have more power in the relationship.



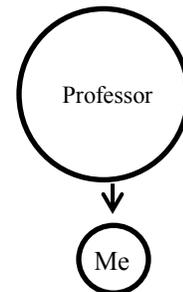
- 3) My professor and I have equal power in the relationship.



- 4) My professor often has more power in the relationship.



- 5) My professor definitely has the most power in the relationship.



Appendix W. Relationship Style Scenarios

Professor Version

Please consider the following six scenarios you may encounter as a professor and indicate how you would anticipate acting in these situations.

Decision-making

- 1) You have been working with your student on a research paper on a particular topic but you have just been informed that the organization you were counting on to fund your research project is no longer able to provide those funds. A new source of funding will need to be secured and in order to do so a new research topic will need to be chosen. Do you:
 - a) Choose the research topic and funding agency yourself and inform your student of the changes.
 - b) Consult your student about his/her ideas and work with your student to determine the new research topic and funding agency.
 - c) Consult your student about his/her ideas and follow their lead in determining the new research topic and funding agency.

Needs met

- 2) You are coming up for a promotion in your department soon and you know that you need to do quite a lot of work in order to get that promotion. You need to publish more papers in academic journals, you need to present your research at more conferences, and you need to sit on more committees at the department. At the same time, you know that your student is waiting for your feedback on their work so that they can complete their degree. Do you:
 - a) Prioritize your work to ensure you get that promotion and inform your student that you will be focusing more on your work and less available to help him/her with his/her research project at this time (in other words, he/she will need to wait longer for your feedback).
 - b) Prioritize your promotion and your student's work equally and work toward your promotion while helping your student in his/her work just the same as before even if that means sacrifices in terms of your time and energy and potentially your promotion.
 - c) Focus on your student's work and put your own work toward your promotion on the back burner even if that means you will likely be sacrificing your promotion.

Empathy

- 3) You and your student have just presented some research findings at a conference. Unfortunately your presentation was not well-received – other professors and professionals attending your presentation asked very difficult questions and made comments that belittled your work. This has upset you. Do you:

- a) Focus on your hurt feelings as a professor and do whatever it is you need to do to cope with these uncomfortable feelings.
- b) Try to soothe your own hurt feelings but also think of how your student must be feeling and try to cheer them up.
- c) Focus on your student's hurt feelings and go out of your way to make him/her feel better without doing much to make yourself feel better.

Clarity

- 4) You and your student have both just attended a departmental meeting for students and faculty. At this meeting the head of the department outlined a number of changes to the rules. Do you:
 - a) Understand your own feelings about these changes very clearly but do not have any idea how your student may feel about these changes.
 - b) Understand your own feelings about these changes and also have a good idea how your student is likely to feel about these changes.
 - c) Have a good grasp of how your student feels about these changes but are unsure of your own feelings about these changes.

Boundaries

- 5) The end of the year is approaching and you want to do something to mark the occasion. Do you:
 - a) Arrange to give a card and small gift to your student on campus at one of your regular meetings.
 - b) Arrange to meet your student for lunch off campus at a restaurant you know you both like and discuss work as well as some aspects of your personal lives.
 - c) Invite your student to your house for dinner to meet your family and get to know them more personally without discussing work very much.

Relationship concern

- 6) You just had a meeting with your student and you noticed that he/she was not as talkative as usual. Do you:
 - a) Disregard that observation and focus on the work that you need to do before you go home that day.
 - b) Proceed with your work but plan to discuss your observation with your student in case there is an issue in your relationship that needs to be addressed.
 - c) Focus on possible explanations for your student not being talkative and consider how you might need to address potential problems with your relationship, which distracts you from your work.

Student Version

Please consider the following six scenarios you may encounter as a student and indicate how you would anticipate acting in these situations.

Decision-making

- 1) You discover that you have some extra time this semester and are considering how you will spend this time. You want to use this time to work on another research project. You know that your thesis supervisor has research projects lined up that are waiting to be completed and you know of another professor with research projects that are waiting to be completed. Do you:
 - a) Decide what you want to do without consulting your thesis supervisor. You would inform your thesis supervisor of any changes to your schedule resulting from this decision.
 - b) Consult your supervisor about his/her wishes and negotiate with your supervisor to determine which project to work on.
 - c) Consult your supervisor about his/her wishes and follow their lead in determining which project to work on.

Needs met

- 2) It is the end of the semester and you have a lot of work to do to ensure you get a good mark in your courses. At the same time, your thesis supervisor has assigned you some duties in the laboratory (entering data, etc.) that is critical for their work. Do you:
 - a) Prioritize your work to ensure you get good marks and inform your supervisor that you will be late in completing the work they assigned you.
 - b) Prioritize your classes and your supervisor's work equally and do your coursework while helping your supervisor in his/her work just the same as before even if that means sacrifices in terms of your time and energy and potentially getting a lower mark than you would otherwise receive.
 - c) Focus on your supervisor's work and put your own coursework on the back burner even if that means you will likely receive a lower mark in your courses.

Empathy

- 3) You and your supervisor have just presented the findings from your thesis or major research project at a conference. Unfortunately your presentation was not well-received – other professors and professionals attending your presentation asked very difficult questions and made comments that belittled your work. This has upset you. Do you:
 - a) Focus on your hurt feelings as a student and do whatever it is you need to do to cope with these uncomfortable feelings.

- b) Try to soothe your own hurt feelings but also think of how your supervisor must be feeling and try to cheer them up.
- c) Focus on your supervisor's hurt feelings and go out of your way to make him/her feel better without doing much to make yourself feel better.

Clarity

- 4) You and your supervisor have both just attended a departmental meeting for students and faculty. At this meeting the head of the department outlined a number of changes to the rules. Do you:
 - a) Understand your own feelings about these changes very clearly but do not have any idea how your supervisor may feel about these changes.
 - b) Understand your own feelings about these changes and also have a good idea how your supervisor is likely to feel about these changes.
 - c) Have a good grasp of how your supervisor feels about these changes but are unsure of your own feelings about these changes.

Boundaries

- 5) The end of the year is approaching and you want to do something to mark the occasion. Do you:
 - a) Arrange to give a card and small gift to your supervisor on campus at one of your regular meetings.
 - b) Arrange to meet your supervisor for lunch off campus at a restaurant you know you both like and discuss work as well as some aspects of your personal lives.
 - c) Invite your professor to your house for dinner to meet your family and/or friends and get to know them more personally without discussing work very much.

Relationship concern

- 6) You just had a meeting with your supervisor and you noticed that he/she was not as talkative as usual. Do you:
 - a) Disregard that observation and focus on the work that you need to do before you go home that day.
 - b) Proceed with your work but plan to discuss your observation with your supervisor in case there is an issue in your relationship that needs to be addressed.
 - c) Focus on possible explanations for your supervisor not being talkative and consider how you might need to address potential problems with your relationship, which distracts you from your work.

Appendix X. Revised Experiment Debriefing

What are we trying to learn in this research?

This study aims to examine factors influencing relationship styles individuals adopt within mentoring relationships. The questionnaires you completed measured your sex, your gender identity (i.e., how traditionally masculine/feminine you describe yourself), and your anticipated relationship style within a mentoring relationship. Your role (as either a student or advisor), your sex, and your gender identity are the three factors that will be examined to see their influence on relationship styles within mentoring relationships.

What are our hypotheses/predictions?

We hypothesize that individuals' biological sex, feminine/masculine characteristics, and role (either as a student or advisor) will influence individuals' relationship styles within the mentoring relationship. More specifically, we predict that women, individuals describing themselves as more feminine, and those in the role of students would be most likely to anticipate adopting a closer, more intimate and personal relationship style.

Why is this important to researchers and the general public?

Research has suggested the importance of mentoring relationships to students' outcomes in graduate school, including mental health and degree completion rates. The current study was designed to examine factors influencing the quality of the mentoring relationship. Understanding these factors may help to improve the quality of mentoring relationships and subsequent student outcomes.

Where can I learn more?

If you are interested in learning about mentoring relationships and student outcomes, see Peluso, D. L., Carleton, R. N., & Asmundson, G. J. G. (2011). Depression symptoms in Canadian psychology graduate students: Do research productivity, funding, and the academic advisory relationship play a role? *Canadian Journal of Behavioural Science, 43*(2), 119-127. If you are interested in relational-cultural theory, which suggests the importance of sex and gender identity to relationship styles, see Jordan, J. V., Kaplan, A. G., Miller, J. B., Stiver, I.P., & Surrey, J. L. (1991). *Women's Growth in Connection: Writings from the Stone Center*. New York: Guilford Press.

If you have questions...

In the event that you have any concerns about this study, or anything you wish to discuss further please use these contacts. For questions or concerns about the study, you may contact Shannon Gottschall (Principal Investigator; sgottsch@connect.carleton.ca), Dr. Shelley Brown (Faculty Sponsor; 613-520-2600, ext. 1505; shelley_brown@carleton.ca). Should you have any ethical concerns about this study then please contact Dr. Monique Sénéchal (Chair of the Carleton University Ethics Committee for Psychological Research; monique_senechal@carleton.ca; 613-520-2600, ext. 1155). Should you have any other concerns about this study then please contact Dr. Anne Bowker (Chair of the Department of Psychology; psychchair@carleton.ca; 613-520-2600, ext. 8218).

If you are feeling distressed...

If participating in this study has upset you in any way you may wish to speak to someone. On-campus counselling is available through Carleton University Health and Counselling Services, 613-520-6674. The Distress Centre of Ottawa and Region (613-238-3311) may also be of help.

Thank you for participating!