SOCIAL SUPPORT IN DOCTORAL EDUCATION: THE ROLE OF RELATIONSHIP RESOURCES AND GENDER IN GRADUATE STUDENT PROFESSIONAL SOCIALIZATION

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ABSTRACT

Paul R. Namaste

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SOCIALIZATION

Sociologists have explored the effect of social relationships on the outcomes of education
for many years. Relationships with parents, teachers, and peers have long been
established to influence student socialization, academic achievement, and educational
aspirations, expectations, and attainment. Therefore, it is surprising that social support,
as conceptualized mainly in the medical sociology literature, has rarely been explored as
a source of influence on educational outcomes. Using the context of doctoral education
in the United States and conceptualizing social support as resources accumulated through
social relationships, I examine not only the effect of social support on graduate student
professional socialization, but also the effect of organizational and individual level
factors on the perceptions and use of support. I use measures from a private dataset
entitled the Survey on Doctoral Education (SDE), as well as data from the National
Research Council and the Integrated Postsecondary Education Data System (IPEDS), to
conduct factor analysis and multivariate regression analysis. My findings suggest that
organizational factors such as institutional and departmental characteristics, discipline,
and departmental climates significantly but differentially affect the perception of most
forms of social support. Furthermore, although women are more likely than men to
perceive higher levels of peer support and personal support from their advisors, they tend
to perceive significantly less support from faculty across several social support measures.
Results also indicate that although social support is thought to be a positive aspect of

social relationships, support can both benefit and detract from the development of professional self-concepts. Women also use some types of social support differently than men in the development of task preparation and confidence, as well as in the establishment of preferences and expectations to work at particular types of institutions as future faculty members. This study has implications for sociological research on social support, social capital, professional socialization, and the reproduction of inequality in education, and offers suggestions for higher education reform.

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Chapter 1: Introduction and Literature Review

Sociologists have explored the effect of social relationships on the outcomes of

education for many years. Relationships involving parents, teachers, and peers have long

been proven to influence student socialization, academic achievement, and educational

aspirations, expectations, and attainment (Adler et al. 1992; Alexander et al. 1987;

Astone and McLanahan 1991; Eder 1981; Entwistle et al. 1988; Lareau 1987; MacLeod

1987; Morgan and Sorensen 1999; Pallas et al. 1994). Relationships between students

and their peers, students and teachers, and parents and teachers are often created and

constrained by the structure and organization of the educational system. Because social

relationships are important for educational outcomes and the educational system

influences the nature of social interactions, sociologists have also focused on studying

how the educational system creates advantages for some students, particularly with

regard to race, class, and gender (Cicourel and Mehan 1985, DiMaggio 1982; Farkas et

al. 1990; Gamoran and Mare 1989; Hallinan 1999; Kozol 1991; Roscigno 1998). Central

to this research, the concepts of cultural capital (Bourdieu 1977) and social capital

(Bourdieu 1985; Coleman 1988) explain how cultural and social resources are

differentially obtained, valued, and used in social interactions within education, which

create direct and indirect effects on educational outcomes and increase race, class, and

gender inequality. Surprisingly, social support has rarely been explicitly explored as a

source of influence on educational outcomes and inequality.

Especially in light of more recent research that conceptualizes social support as

either social capital converted into support (Stanton-Salazar 1997) or a form of social

capital itself (Offer and Schneider 2007), the potential connections between social

support and education are promising. Predominantly used within the medical sociology literature, social support is a multidimensional concept (Berkman et al. 2000; House et al. 1988; Sarason et al. 1990; Thoits 1982, 1995; Vaux 1988) that not only refers to the general sense of being accepted and aided by others, but more importantly identifies specific behavior exchanges and interaction processes that provide problem-focused or need-based assistance and encouragement (Rook 1990; Thoits 1982). Social support measures can indicate how interactions with various agents provide varying levels of emotional, informational, and instrumental aid. As such, they can provide an excellent tool for exploring the resources embedded in the relationships, roles, and structures within an educational context.

Since higher education is part of the same social institution of education, it is likely that the same organizational, interpersonal, and stratifying processes that influence the earlier levels of education are also present in the postsecondary levels. Therefore, it is also surprising that sociologists spend much less time studying higher education if the educational system, educational achievement, and educational attainment have such an important impact on socialization, occupational attainment, social mobility, and structured inequality in the United States (Collins 1971; Kerckhoff 1976; Sewell and Hauser 1975; Shavit and Blossfeld 1993; Wiebe 1969). Particularly with credentialism (Collins 1979; Labaree 1997) pushing the needed levels of education for social mobility higher and higher, the system of higher education should have a larger and larger effect on the creation and maintenance of social inequality. Furthermore, if faculty, as part of the system of higher education, play a role in the reproduction of inequality, then faculty at the highest levels of education, namely graduate education, influence the entire system

of higher education through their development of other college and university faculty. Faculty, who educate the teachers and faculty of the future, reproduce educational inequality in the learning, training, and socialization for multiple generations of academic professionals. Thus, an understanding of how inequality is created within the social institution of education is incomplete if it does not included an examination of graduate education and the potential it holds for reproducing inequality in the training of institutional agents who carry out the organizational, interpersonal, and stratifying processes at the primary and secondary levels of education.

In both sociology and higher education, relatively little research has been specifically conducted on graduate and professional education, particularly concerning the social sciences and humanities (Bowen & Rudenstine 1992). Also, much of this literature has emphasized student attrition and models of socialization, making few connections to patterns of race, class, or gender inequality. Sociologists did conduct a fair amount of work on graduate education in the 1960s and early 1970s. This earlier sociological research typically utilized traditional theoretical approaches of either structural-functionalism or symbolic interactionism in studying the process of graduate student socialization, and usually concentrated on graduate students within the professions, especially medicine. Since the late 1960s when higher education began developing as an academic field in its own right, sociologists appear to have given much less attention to graduate education. As a result, most of the more recent research on graduate education has shifted towards the priorities and perspectives related to schools of education, which include a greater emphasis on practical and policy issues as well as a

theoretical emphasis on psychological and developmental stage approaches to graduate student socialization.

The purpose of this study is to continue the tradition of studying the effects of social relationships on educational outcomes and inequality, but doing so with a new conceptual tool and targeting a segment of the educational system that receives much less attention. Using the context of doctoral education in the United States and conceptualizing social support as resources accumulated through social relationships, I examine not only the effect of social support on graduate student professional socialization, but also the effect of organizational and individual level factors on the perceptions and use of support. I use measures from a private dataset entitled the Survey on Doctoral Education (SDE), as well as data from the National Research Council and the Integrated Postsecondary Education Data System (IPEDS), to conduct factor analysis and multivariate regression analysis. The main sample consists of 3,023 graduate students in 190 different departments at 26 universities representing 9 disciplines in the arts and sciences.

Research Questions

This dissertation addresses the following research questions:

1. ***How can the concepts of social support be applied and operationalized within the context of graduate education?*** Does the concept of social support make sense in the context of graduate education? Do advisors, faculty, and peers provide different types of social support? Do advisors, faculty, and peers each provide more than one

form of social support? Do the types of support that advisors provide differ from those provided by faculty in general?

2. ***What are the effects of institutional context on student perceptions of social support?*** More specifically, do students at public universities perceive higher levels of support from their advisors, faculty and peers than at private institutions? Are universities that participate in future faculty development programs perceived as providing more support with regard to program completion and career development?

3. ***What are the effects of departmental context on student perceptions of social support?*** Is there a significant difference in the amount of social support that students perceive from department to department? Does it differ depending on the type of social support? Do departments in some disciplines provide more support than other disciplines? In particular, do students in physical science departments, such as chemistry and geology, receive less support from their advisors, faculty, and peers than do students in the social sciences and humanities? Do a department's characteristics such as ranking, size, and average number of years to graduation affect students' perceptions of support? For example, do students in larger departments perceive less support from the faculty than students in smaller departments? Do departmental climates affect student perceptions of support?

4. ***What are the effects of social support on students' professional self-concepts?*** Specifically, do students who perceive more support, also perceive themselves as more prepared and more confident in their professional abilities? Are specific types of support more significant for increasing confidence in particular types of professional tasks? For example, are students who perceive higher levels of advisor

support more confident in their ability to conduct research and teach graduate level courses? Does social support have any effect on preferences and expectations for the type of institution at which students want to establish their careers? For example, are students who perceive higher levels of advisor support more likely to aspire to careers at Ph.D. level institutions even after controlling for higher self-confidence in their ability to conduct research and to teach graduate classes? Are some effects of organizational and individual factors on professional self-concepts conditional on social support?

5. ***What are the effects of gender on student perceptions of social support?*** For example, do women and men differ significantly in the amount of social support that they perceive? Do these differences depend on who is providing the support or the type of support that is perceived? For example, do women perceive less support from advisors, but more support from faculty? Do men perceive more instrumental support from advisors than women, but women perceive more emotional support from advisors than men?

6. ***What are the effects of gender on students' professional self-concepts?*** Do men perceive themselves as more prepared to conduct certain professional tasks than women? Are men more confident than women in their ability to perform professional tasks? Does the effect of gender depend on the task to be performed? For example, are women more confident to conduct undergraduate level faculty tasks, whereas men are more confident to conduct graduate level tasks? Do men have greater aspirations for faculty careers in Ph.D. level institutions than women? Do they have higher expectations for working at these institutions than women?

7. ***Are the effects of social support on professional self-concepts conditional on***

   gender? In other words, do women receive fewer benefits than men from social

   support in its effect on professional self-concepts? For example, does advisor support

   give men more confidence than women to conduct faculty tasks? Does faculty

   support have a stronger effect on career aspirations for men than for women?

<center>Organization of the Dissertation</center>

In this first chapter, I have already laid out the rationale for this study and

presented the research questions that will be addressed. The remainder of the chapter

reviews the theoretical connections and the related research that informs this study.

Chapter 2 describes the data, measures, and methods of analysis that will be employed to

answer the presented research questions, and discusses the methodological limitations

that exist. Chapter 3 reports the empirical findings that explain how structural factors are

related to student perceptions of social support from their advisors, faculty, and peers.

Chapter 4 then discusses the results of analyses that determine how these social support

measures affect individual perceptions of preparedness and confidence to perform

professional tasks. Chapter 4 also explains how measures of social support influence the

preference and expectation for the type of institution in which students would like to

perform these tasks during their faculty careers. Chapter 5 focuses specifically on how

gender affects the perception of social support and the development of professional self-

concepts. The final chapter reviews the major empirical findings of this study, what

insights they may provide for research on professional socialization, social capital, and

inequality in education. Possible areas of future study in both sociology and higher

education, and the potential areas for policy and procedural changes for graduate

departments, research institutions, and professional associations are also discussed.

Theoretical Connections and Related Research

Several theoretical connections and areas of research inform the questions,

analyses, and interpretations of this project. This study takes a social support approach to

studying how social interactions in graduate education contribute to professional

socialization and inequality. Therefore, I will briefly examine the relevant literature on

professional socialization, capital and educational inequality, and social support,

indicating whenever possible how it relates to graduate education.

Graduate Student and Professional Socialization

Socialization is one of the core concepts in the field of sociology, and it has been

defined in a variety of ways to emphasize different aspects of the socialization process.

Researchers have typically focused on the individual as the recipient of the socialization

process or on the social context which contains the agents, instruments, and settings

through which the process takes place (Pavalko 1971). One of the more widely used

definitions comes from Merton (1957), who defined socialization as "the processes by

which people selectively acquire the values and attitudes, the interests, skills, and

knowledge—in short, the culture—current in the groups of which they are, or seek to

become, a member. It refers to the learning of social roles" (p. 287). For children, this

process is usually an unconscious and unintended part of everyday human interaction, but

can be explicit and intentional through settings such as public schools. For adults this

socialization process is typically seen as more intentional and voluntary, often taking

place in an organizational setting involved in the training of future professionals or in the

actual performance of the professional role itself (Pavalko 1971). Since adults have

already undergone many years of prior socialization, the process often involves a great

deal of unlearning and adaptation of new professional values and identities into the

previous self-concepts. Thus, when trying to understand the socialization and

development of adults and new professionals the study of graduate and professional

schools can be a vital component.

Focus on either the individual as the object of socialization or the social context as

the source of socialization has resulted in two similar but slightly different approaches to

the study of socialization in graduate school. Approaches that emphasize the effects of

socialization on individuals usually result in an emphasis on *outcomes* to determine how

well an individual has been "successfully socialized". Studies that highlight the social

context focus on how well contextual factors work in creating an "effective socialization

process". Both bodies of literature provide valuable insights that contribute to this

project.

In addition to the emphasis on outcomes or process, sociological approaches to

adult socialization have historically come either from a structural-functionalist

perspective in the form of role theory or from a symbolic interactionist perspective;

however, more recent research has been moving towards a greater integration of

approaches (Mortimer & Simmons 1978; Stryker & Statham 1985). From a functionalist

perspective the socialization process is quite predictable with the "socializee" taking on a

rather passive role where they exert very little influence onto the socialization process. However, symbolic interactionists view the "socializee" as a much more active agent in a dynamic process in which both the "socializers" and "socializees" can change. Although the two perspectives differ in their general approach to socialization, they do agree that the mechanism through which the learning of norms, values, skills, and behaviors of the socializing group occurs is *interpersonal* (Mortimer & Simmons 1978, Stryker & Statham 1985). This interpersonal commonality as well as the recognition of their complimentary strengths and weaknesses has contributed to the convergence between the two theoretical frameworks. Both frameworks have begun to adopt theoretical and conceptual elements from each other so that they may explain more together than they can separately, especially with concepts relating to structure and agency (Handel 1979, Stryker & Statham 1985).

Within sociology and higher education, researchers have a growing tendency to put more emphasis on both individual and structural factors in order to more completely explain the socialization process. This study borrows concepts and variables from both process and outcomes oriented studies in an attempt to build on their strengths and address some of their limitations. Analysis in this dissertation takes a combined approach, which looks at the effects of both structural and individual factors primarily through social interaction in shaping the perceived social support and the professional self-concepts of students in doctoral programs in the arts and sciences.

Literature Emphasizing the Socialization Process

Especially within a formal training environment like graduate and professional school, socialization is viewed as a process that takes place over an extended period of time within particular social contexts that contain various agents, structures, and instruments that help to shape and carry out the process. Some research on graduate education focuses more on the components and processes within the social context that contribute to graduate student socialization. When researchers began studying the process of socialization, quantitative methods were much less advanced, particularly in handling longitudinal data. As a result, the earlier research utilized ethnographic methods and case studies of single institutions in order to analyze the process of professional socialization over extended periods of time. This yielded several phase and stage models that described the professional socialization process.

However, traditional stage and phase models of socialization usually take an approach to development that is very linear in nature, which has long been criticized for four common reasons (e.g. Antony 2001; Tierney 1997). First, similar to the criticism of earlier work in graduate education mentioned earlier, the linear nature of socialization theories often assume that students are all the same and go through the process in much the same way (Feldman 1974). Second, traditional linear approaches to socialization while including the effects of some student characteristics, have ignored the effects of student perceptions (Wentworth 1980). Third, linear perspectives, although often based on normative expectations, fail to account for changes in normative role expectations over time (Thronton & Nardi 1975). Finally, linear approaches are usually built upon the congruence and assimilation orientation, which places the socializing power into the

hands of the institution, and requires that the students change to meet the needs of the organization and never the reverse (Antony 2001; Weidman et al. 2001). Thus, traditional approaches to graduate and professional student socialization have been criticized for being too homogenizing, one-sided, static, and unidirectional.

As the first comprehensive studies of medical education, *The Student-Physician* (Merton et al. 1957) and *Boys in White* (Becker et al. 1961) highlighted the central role of social relationships and social interaction in the process of professional socialization. Together these seminal works formed the foundation for much of the later work on professional socialization in sociology. However, these two studies have conflicting interpretations of the how social interaction affects the socialization process in medical school training. In the Merton study, professional socialization is a progressive and incremental process. Students decrease the tendency to think of themselves as students and increase their perceptions of themselves as doctors as social interactions with faculty, patients, and staff provide them with the knowledge, skills, values, and attitudes that they need to adequately perform the role of a physician. However, the Becker study concludes that "students do not take on a professional role while they are students, largely because the system they operate in does not allow them to do so" (p. 420). Students have opportunities to "play" at being a doctor, but their interactions with faculty and hospital staff, as well as limited responsibilities and authority, do not give them the impression that they are or should think of themselves as anything but students. While Merton and his associates see medical schools using social interaction as an intentional and functional part of professional role acquisition, Becker and his associates see medical schools using social interaction as an impediment to it.

The Student-Physician and *Boys in White* each emphasize different sources of influence on the socialization process, and although this dissertation cannot directly analyze the process of socialization, the effects of both these sources are incorporated. In *The Student-Physician*, Merton and his associates (1957) focus on the effects of institutional structure in shaping social interaction and the socialization process. Using an approach grounded in structural-functional theory, they believe that socialization occurs mainly through interaction that has been structured by the medical school for the purpose of role acquisition. In *Boys in White*, on the other hand, Becker and his associates (1961) focus on the effects of individuals in influencing the socialization process. Coming from a symbolic interactionist perspective, they do not picture socialization as a smooth process oriented mainly within the organization of the medical school, and suggest that students have the power to resist simply becoming what the medical school wants them to become. This dissertation explores the possibility that both organization structure and individual factors can influence social interaction and socialization.

Although they do not focus on the topic of social inequality, *The Student-Physician* and *Boys in White* also point to different causes for the variability of socialization outcomes. For Merton and his associates (1957), the goal of professional socialization was to make physicians as similar as possible, and doctors emerging from medical school were similar because they were exposed to similar patterns of social interaction. Variations did result in the kinds of physicians that people became, but it was because social interactions within medical school were only similar and not identical (Merton et al. 1957). For Becker and his associates (1961), doctors emerged from

medical school appearing similar because they each had to perform within similar medical school environments. However, because students possessed their own values and ideas of the kind of physician they would like to be and they chose different settings under which to practice, variations resulted in the kinds of physicians that people became. In one case different outcomes were the unintended but unavoidable result of contextual difference, but in the other differences resulted from intentional individual action. This dissertation also explores the possibility that both organization structure and individual factors can cause differences in socialization outcomes.

As other research emerged and began to look at different professional socialization settings, additional phase and stage perspectives were developed that more closely aligned themselves with the functionalist approach taken in *The Student Physician* where students developed incrementally as they moved through their programs which were structured to reproduce their profession through the training and indoctrination of the next generation of professionals. Simpson (1967) describes how nurses move through stages where they lose their initial lay conceptions of the profession to develop technical perspectives and skills, foster an attachment to other professionals rather than patients, and internalize professional values so that the profession itself becomes the dominant reference group. Rather than stages, Sherlock and Morris (1967) present a paradigm of six overlapping processes (selection, sequestration, sanctioning, didactic instruction, apprenticeship, certification, and sponsorship) that vary in their presence and intensity immediately before, during, and right after professional training. This line of research pushed the main thrust of the socialization process solely onto organizational structure, which acted upon individuals to create the appropriate outcomes.

Some research also began to identify structural components that, if deficient, would cause the process of socialization to become less effective. Rosen and Bates (1967) discuss the structural characteristics that are necessary to interact with students in order for them to properly acquire their professional roles. The adequate presence of role prescriptions, the sequential aspects of socialization, the distribution of authority, the sanction system, and the degree of consensus and conflict over goals were all seen as vital (Rosen and Bates 1967). Lack of information and unclear expectations were also shown to lead to increased stress and less than optimal socialization and fulfillment of role expectations (Heiss 1964; Mechanic 1962). From this functionalist perspective, effective professional socialization was simply a matter of establishing the proper organizational structure designed to achieve the desired ends.

Weidman, Twale, and Stein (2001) have developed a more integrated framework for graduate and professional student socialization, which based on prior literature, tries to address many of the common criticisms of traditional socialization models. Rather than being unidirectional, elements in the framework can work in a bi-directional manner so that there is reciprocity of influence where different aspects of the socialization context and process can affect each other (Kerckhoff 1976; Stein & Weidman 1989). Thus, the socialization process can no longer be static because competing socializing agents, such as faculty and professional groups can cause normative expectations and professional roles to evolve over time (Oleson & Whittaker 1968; Stein & Weidman 1989). Furthermore, socialization does not have to be a one-sided influence of structure upon the individual because, as being part of the socialization process and context, individuals can attempt to influence the expectations of others just as others are trying to

influence them (Thornton & Nardi 1975). As such, socialization is not only the transfer and reproduction of a professional culture from one group onto another, but also an active creation of new identities through individual agency (Reinharz 1979). Individual influence allows the socialization process to be potentially different from one student to the next because of the differences in interpretations, values, needs, and influences of the students and other socializing agents involved in the specific socialization process and context (Stein 1992).

The Weidman et al. (2001) conceptual framework represents the most contemporary perspective on graduate education and graduate student socialization, and is considered by many as the standard for the approach to socialization in higher education (Nettles & Millett 2006), yet there are three main limitations of this work. First, although based on a very comprehensive review of the relevant research, the conceptual model does not provide full theoretical explanations of their approach. They explain that their earlier work (Stein & Weidman 1989) uses mainly a structural-functional approach, and thus is subject to the typical criticisms, which include the lack of autonomy on the part of individual actors (Tierney 1997). However, the extension of their new framework to a more interactive approach is explained solely using practical reasons and makes no mention of possible connections to established theories such as symbolic interaction or exchange theory. Second, the model does not provide adequate theoretical explanations for inequality in graduate socialization based on individual factors such as gender and race. Their review of the literature does indicate some gender and racial inequality in graduate education, but the proposed model fails to provide

adequate answers as to why or how it happens. Third, the model is still mainly

conceptual as a complete framework and has not been empirically tested in its full form.

This dissertation is conceptually similar to the Weidman et al. (2001) model in

that it takes an integrative approach to graduate student socialization. Outcome measures

explore the development of professional self-concepts, but outcome measures also

examine students' assessments of interactive components in the professional socialization

process. Furthermore, students are not conceptualized as passive receptacles of

professional culture, but rather, through social interaction with advisors, faculty, and

peers, students take an active role in pursuing resources to aid in their professional

socialization. However, theoretically, this dissertation takes a more critical theory

approach, which views graduate education as reproducing social inequality as the result

of differences in resources that are accumulated through social interaction.

Literature Emphasizing Individual Socialization Outcomes

If socialization is defined as the processes of acquiring culture – the values,

attitudes, interests, skills, and knowledge – of a selected group, then focusing on

outcomes would involve looking at the extent to which this "professional culture" has

been successfully transmitted to the individual and/or the ways in which individuals

identify themselves as a member of the profession. With few exceptions (e.g. Stark et al.

1982; Weidman et al. 2001; Weiss 1981), researchers typically focus conceptually and

empirically on either the acquisition of a professional identity or other indicators of the

acquisition of professional culture. On the one hand, the concept of professional identity

has been overly simplified; on the other hand, aspects of professional culture are quite

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varied, but relatively unexplored. Unfortunately, few researchers explore the connection between both these outcomes, especially in quantitative oriented studies.

If one agrees that the acquisition of professional culture involves the learning and internalization of the values, attitudes, interests, skills, and knowledge of a profession, then there are a plethora of potential student outcomes; however, few of these outcomes have been explored. The diversity of academic disciplines and professional cultures can make it difficult to examine some outcomes across groups of students from different disciplines. This may be why, for example, samples very rarely contain both graduate and professional students, and studies on professional students are usually restricted to a single profession. Because of the differences in relevant knowledge and skills, it would be extremely difficult to compare the actual levels of acquired knowledge and skills in a study that contained medical students and students within the arts and sciences.

In addition to restricting their samples to make comparisons conceptually easier, researchers have typically relied on students' subjective perceptions of their knowledge and skill acquisition rather than on objective measures. As outcomes, researchers have looked at objective measures of involvement in professional research activity (Keith & Moore 1995; Moore & Keith 1992; Weidman & Stein 2003; Weiss 1981), subjective measures such as confidence in their professional abilities (Keith & Moore 1995), and commitment to a field of study (Lindholm 2004; Wright 1967). Although there are some logistical restrictions to the types of outcomes that can be pursued to illustrate the acquisition of professional culture, there have been few socialization outcomes that have been explored in graduate education in relation to what the definition of socialization would allow. This dissertation will explore more generalized perceptions of task

preparation and confidence, so that student comparisons can be made across disciplines within the arts and sciences.

When looking at research on professional culture acquisition, career aspirations are the most popular outcome explored because career aspirations not only indicate that professional culture has been acquired and accepted, but they also indicate how individuals plan to take part in the professional culture in the future. In retrospective interviews with faculty, Lindholm (2004) found that the decision to pursue disciplinary-based professional careers both in and out of the academy increased when they had positive relationships with undergraduate as well as graduate faculty and were involved in "hands on" professional activities such as teaching and research. Also, students experience greater changes in the type of faculty positions they would like to hold when they have higher levels of integration with faculty (Gottlieb 1961); however, the strength and nature of these changes are dependent on the career focus of the department (Gottlieb 1961). Changes orient towards working with graduate students in the future if a department is more single-minded towards research, whereas for students in more eclectic departments, changes in career interests are based on the encouragement faculty give them in relation to their perceived talents (Gottlieb 1961). Also, increased student interest in careers at Ph.D. granting institutions can result from other departmental characteristics such as high departmental prestige (Gumport 2000; Keith & Moore 1995), and increased desires to work in non-academic vs. academic careers can be related to the discipline of a student's department (Gumport 2000; Fox & Stephan 2001). In this dissertation, I also examine career related aspirations, and propose that departmental characteristics, through there influence on social interaction, will affect these outcomes.

However, studies also indicate that student career aspirations differ by individual level factors, which may indicate a self-perpetuating bias in the system of graduate education. Preferences for academic careers at research universities are higher among men, whereas interest in academic careers at more teaching-oriented institutions is higher among women (Feldman 1974; Fox & Faver 1981; Fox & Stephan 2001; Moore & Keith 1992). The decision to pursue any academic career has also been shown to be affected by gender with more men wanting traditional faculty positions than women (Feldman 1974). Graduate education may contain filters of exclusion that cause a disproportionate distribution into different types of faculty positions based on race and gender, which would perpetuate the under-representation of women and minority role-models as graduate faculty (Yoder 1984).

The attainment of a professional identity has been somewhat explored in the literature; however, its limited study and conceptual simplicity has contributed to its classification as an outcome relatively separate from the acquisition of aspects of professional culture. Outcomes related to the assimilation of a professional identity are less frequently examined than the acquisition of professional culture, and are often unidimensional. Although a couple of multi-dimensional self-concept indexes that include self-perceptions such as intellectual competence (Hall 1968) and intellectual curiosity (Weiss 1981) have been used, the focus has typically been on the extent to which graduate students feel less like students or "neophytes" and more like their professors or members of their profession (Becker et al. 1961; Merton et al. 1957; Pavalko & Holley 1974). Identity as a professional has been shown to increase with the frequency of student-faculty interactions, and when students interact with faculty

members who view students more as colleagues than as students (Weiss 1981). Professional self-concepts also increase as students have more opportunity to take part in professional activities that allow them to "practice" the professional roles to which they aspire (Pavalko & Holley 1974). Because the acquisition of professional culture is usually based on self-perceptions, they are conceptually similar to professional identity and should be considered as another dimension of a professional self-concept.

Becker and Carper (1956) offer a more comprehensive and multidimensional conceptualization of a professional self-concept that incorporates dimensions of both professional identity and subjective attitudes and perceptions about professional culture. They found that interviews with graduate students revealed four components of work identification: 1) occupational title, and associated ideology; 2) commitment to occupational tasks; 3) commitment to particular organizations or institutional positions; and 4) significance for one's position in the larger society. Occupational titles carry a great deal of symbolic meaning that people tend to incorporate into their identity. A title such as "sociologist" or "professor" specifies an area of interest and/or a general set of activities in which professionals will take part similar to others with the same title. Professionals may also be compared within or across occupations based on the extent to which they identify with specific work oriented tasks. For example, most professors take part in some aspect of teaching students, but some may choose to identify themselves as researchers more than teachers. Likewise, faculty can work at a variety of institutions that vary based on size, governance, highest level of degree offered, educational mission, etc. However, some academics may have a vision of their professional future tied to a particular institution or range of institutional types, and will adjust their behavior and

qualifications to meet what they see as the expectations for a career in those institutions. Finally, occupational identities also contain implicit reference to a person's position in the broader society. Occupational prestige is often used by sociologists in calculating Socioeconomic Status (SES), and people can use their professional status as a means to convey or possibly improve the perceived values of their overall identity. Although empirically Becker and Carper (1956) based these findings on a small sample of interviews with graduate students, conceptually this framework provides a much more comprehensive and multidimensional approach for exploring outcomes related to professional socialization.

Overall, studies that emphasize outcomes of graduate and professional socialization have provided some important insights into how organizational and individual characteristics affect the acquisition of professional culture and the development of a professional identity; however, studies on socialization outcomes often possess a couple of general limitations. One shortcoming is that most are based on relatively small samples and few, if more than one, institutions or disciplines. Also, surprisingly few studies have examined the effect of race and gender on socialization outcomes. Furthermore, although Keith and Moore (1995) find support for a theoretical approach that combines a tournament model (Rosenbaum 1986) with models of social integration (Girves & Wemmerus 1988; Tinto 1975), most other studies are empirically driven, focusing only on a general concept that individual and departmental factors affect socialization (Anderson 1996; Gottlieb 1961; Gumport 2000; Nettles and Millett 2006; Pavalko & Holley 1974; Weiss 1981). The limitations make it difficult to generalize

findings to the entire system of graduate education, while the explanations of these findings remain theoretically thin.

This dissertation attempts to overcome some of the shortcomings related to sample size, outcome conceptualization, gendered outcomes, and use of theory. A larger sample of more than 3,000 graduate students is being utilized to determine organizational effects across multiple institutions, departments, and disciplines. Also, professional identity/self-concept is measured using the first three components of the Becker and Carper (1956) model, in an attempt to take a more multidimensional approach to socialization outcomes. Furthermore, using approaches from the study of inequality in K-12 education, I build on previous findings regarding the importance of faculty interaction to address some of the differences in outcomes based on gender. Finally, an approach grounded in critical theory allows graduate student socialization to be viewed as a process in which limiting structures and independent actors both take part, which often results in the reproduction of inequality in education.

Capital and Inequality in Education

Both Pierre Bourdieu and James Coleman have made important contributions to the sociology of education literature through their work on the concept of capital. Pierre Bourdieu is usually credited for the initial conceptualization of cultural and social capital, although he is most known for his elaboration and application of the former. Capital in either an objectified or embodied state refers to the potential capacity to produce profit; it takes time to accumulate, tends to persist, has the ability to be reproduced and expanded, and because its value is inherent in social structure, it can vary in relation to the social

context/field (Bourdieu 1986). Essentially, capital is power and as such provides the motivation and the mechanism for structural and individual action. Capital exists in several forms – human, economic, cultural, social, and symbolic – and can be converted from one form to another (Bourdieu 1986; Coleman 1988). Structural advantages in the educational system can allow some students to accumulate capital more readily than others leading to inequality in educational outcomes.

In his writings, Bourdieu emphasized the role of cultural capital in the creation of educational inequality. Bourdieu (1986) believed that cultural capital can exist in three forms: *embodied* in the lasting dispositions of the mind and body; *objectified* in cultural goods such as books, paintings, and buildings; and, *institutionalized,* such as in the form of educational degrees, which signifies an institutionally legitimized form of qualifications. Cultural capital applies to education in that students, who because of their previous experiences and background, have a strong set of embodied dispositions (habitus) that allow them to better utilize the objectified forms of cultural capital embedded within schools, and are more likely to be "successful" and institutionally legitimized (Bourdieu 1977). Therefore, students who come from cultural backgrounds similar to the people who establish and run schools have a competitive advantage to succeed, which leads to educational inequality.

Social capital can also play a role in the creation of educational inequality. Like Bourdieu (1986), Coleman (1988) believes that social capital exists in the *network of relationships* within a given field, and that its value is based not only on the number of connections that people can mobilize in their favor, but also the accumulated forms of capital that each of those connections possess. Furthermore, like cultural capital, he

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believes that social capital exists in several forms. Social capital can be accessed if

someone: is indebted to them by some *obligation* and/or expectation based on mutual

trust; can provide a person with *information*; or their behavior is restricted or facilitated

in beneficial ways by *norms* that provide sanctions or rewards (Coleman 1988). Social

capital provides potential access to resources that can be used for personal gains or be

converted into other forms of capital (Lin 2000). Because individual relationship

networks differ, social capital allows researchers to make differentiations in individual

outcomes and what components of a social structure contribute to producing value

(Coleman 1988). In educational research, most qualitative studies of social capital have

addressed networks that link parents of school peers, whereas quantitative studies have

focused on the social interactions between students and their parents and the effect of

these interactions on test scores, grades, study habits, or staying in high school (Horvat et

al. 2003). In the first group of studies, parents use their social ties with other parents to

mobilize resources (individually or collectively) to interact with school officials on behalf

of their children (Horvat et al. 2003; Lareau 1989). In the latter, the social ties that

children have with parents, allows them to mobilize their parents' human and financial

capital to develop their own forms of capital (Teachman et al. 1997).

Social capital and cultural capital are part of the critical theory approach to

studying education. In the sociology of education, critical theory, particularly in the form

of reproduction theory, began in the 1970s and attempted to bring the focus of class based

inequality onto structural factors. The essence of reproduction theory suggests that

schools, as social structures within a society, reproduce the existing class structure

because they are based on and utilize the values and beliefs of the dominant culture and

must also answer to other powerful social systems (economic, political, etc.) that are likewise based on the dominant culture (Bell 1977; Bourdieu & Passeron 1977; Bowles & Gintis 1976; Jencks et al. 1972). As such, cultural advantage (cultural capital) is transferred into academic advantage, which is legitimized by schools as achievement, thus creating a false meritocracy that reproduces and maintains a disguised competitive class advantage all throughout the educational system (Bell 1977; Bourdieu 1977; Bourdieu & Passeron 1977). Social capital is viewed as one of the ways in which other forms of capital can be accessed and accumulated within the structure of the educational system. If the system of education provides an unfair advantage for some students to accumulate capital, then inequality in educational outcomes will result.

Resistance theory of the late 1970s and 1980s was born in direct response to criticisms of reproduction theory, and brought more explanatory power to the critical theory perspective. Resistance theorists such as Willis (1977) and Giroux (1983) believed that the structural approach to reproduction theory was overly deterministic. They believed that lower class youth were not passive entities within schools, but rather had agency and acted as individuals and collectives to oppose the order of the dominant culture. From the resistance theory perspective, schools did to a large extent reproduce the dominant culture, but individual and collective action could make the process less effective and the extent of reproduction less complete. However, the problem with both reproduction and resistance theories is that they overemphasize the role of class to the exclusion of other factors such as race and gender.

Moving through the 1980s and into the 1990s there was an increasing interest in trying to determine if educational inequality existed based on race and gender as well as

class (Davies 1995). Whether addressing ability grouping and tracking (Hallinan 1994, Oaks 1985; Pallas et al. 1994), instructional materials (Apple 1988), classroom interaction (Constantinople et al. 1988; Crawford & MacLeod 1990; Grant 1985), desegregation (Farley et al. 1980; Olzak & Shanahan 1994, Orfield et al. 1996; Smock & Wilson 1991) or educational achievement (Ainsworth-Darnell & Downey 1998; Fischer et al. 1996; Mickelson 1989; Warren 1996), it became very clear that gender and race matter, so much so that women and racial minorities are at a disadvantage in the education system when compared to men and the white majority. Gender inequality has been examined in graduate education in relation to areas such as the likelihood to attend graduate school (Baird 1976), discipline of enrollment (Baird 1976; Feldman 1974), attrition (Bowen and Rudenstine 1992; Lovitts 2001), mentoring experiences (Turner and Thompson 1993), degree completion (Wong and Sanders 1983), career aspirations (Fox and Faver 1981; Fox and Stephan 2001; Moore and Keith 1992), and career attainment (Fox 2001; Long and Fox 1995); however, few of these studies pursued theoretical explanations for unequal gender effects. The effects of race and gender as well as class are now a permanent part of the study of educational inequality, although there has been some criticism that these variables are too often addressed separately and not enough research explores their interaction (Davies 1995; Grant & Sleeter 1986).

New attempts are now being made to examine more complex relationships between race, class, and gender, and the interactive relationship between individual characteristics and school structure. Using Bourdieu's (1977) concepts of cultural capital and habitus, Willis' (1977) notion of cultural production, and Giroux's (1983) perspective of resistance, MacLeod (1987) tries to explain how structural determinants

interact with human agency to shape the aspirations and behavior of individuals to reinforce or resist the dominant culture. Lareau and Horvat (1999) build upon the work of MacLeod to include Coleman's (1988) concept of social capital in addition to cultural capital and emphasize three main points: 1) the value of capital depends heavily on the social setting (context or field); 2) there is an important distinction between the possession and activation of capital and other resources; and 3) the combination of points 1 & 2 illustrates that rather than being deterministic and automatic, reproduction is jagged and uneven and is continually negotiated by social actors. Although both of these studies were very effective in illustrating the interaction effects of race and class, both were qualitative studies in a single social context therefore allowing the researchers to only examine within school effects. Roscigno (1998) utilizes a quantitative approach that allows him to explore both the within-school and between-school effects in relation to race and class. His findings suggest that schools, at least partially, reproduce the inequalities with which children initially arrive (Roscigno 1998).

The research by MacLeod (1987), Lareau and Horvat (1999), and Roscigno (1998) are attempts to explore in an educational setting what Lin (2000) refers to as capital deficit and return deficit. *Capital deficit* refers to the relative shortage in the quality or quantity of capital for one group as compared to another. The differential acquisition of capital can result from different opportunities provided by the structure of institutions to access sources of social capital, or from different investments made by institutions or group members into resources that provide different amounts of social capital. Women and minorities tend to occupy disadvantaged structure positions in social institutions and also have a tendency to interact with other disadvantaged members

(homophily), who usually provide them with less capital. Lin (2000) concludes that

"inequality in social capital, therefore, can be accounted for largely by structural

constraints and the normative dynamics of social interactions" (p.793). *Return deficit*, on

the other hand, refers to the fewer rewards or benefits that one group receives as

compared to another for the same quality or quantity of capital. Differential returns can

result from the social actor mobilizing less effective capital for the instrumental action

they wish to take, the reluctance of social ties to invest their capital in that person, or a

normative bias in the institutional field that perceives the capital from particular groups

as less valuable. Research does confirm the relative disadvantage of women and

minorities in the accumulation of social capital. However, few studies examine the

effects of race or gender on the returns of capital, and the results of these studies are

mixed and inconclusive.

The use of capital, particularly social capital, in the current literature is not

without its criticisms. One of the main critiques is that the distinction between social

capital and the resources obtained through the social ties that constitute social capital is

often missing or is unclear (Portes 1998; Dika and Singh 2002). Having social ties with

individuals who can potentially provide a person with resources is not the same as

actually acquiring those resources. Social capital cannot be equated with the resources

that are acquired through it; however, because there is a positive link between social

capital and educational indicators, more research is necessary to explore the complex

connections between resources accumulated through social relationship networks and

educational outcomes (Dika and Singh 2002).

This dissertation tries to investigate some of the intricate linkages between social relationships, the accumulation of resources, and educational outcomes. This study explores the effects of structural and individual factors on socialization and gender inequality in the context of graduate education. Conceptualizing social support as resources accumulated through social relationships, I examine if organizational level factors lead to unequal accumulation of social support. Differences in social support translate into differences in valuable resources such as human capital (capital deficit). Therefore, I also investigate the effect of social support on graduate student professional socialization to determine if these mobilized resources do have an effect on socialization outcomes. Finally, I examine the conditional and interactive nature of gender and support in an attempt to determine if women's returns on social support are different than men's in developing their professional identities (return deficit).

Social Relationships & Social Support

Social interaction between organizational actors is the foundation of the socialization process in education. The literature on both graduate and undergraduate education is filled with results on the influence of faculty-student interaction and peer interaction on student retention, success, and socialization (e.g. Baird 1990b; Girves and Wemmerus 1988; Golde 2000; Tinto 1975; Weidman and Stein 2003), and social interaction is often used as an indication of social integration. Largely based on the work of Tinto (1975), who uses the concept of social integration in a Durkheimian (1951) sense, the application and operationalization of social integration in the higher education literature is vague and inconsistent. Although generally seen as positive and often

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implying some notion of social support, social integration is often only measured in quantitative terms of informal social interaction, making it unidimensional and oversimplified (Pascarella 1980). Rather than just counting how often students meet with faculty or their peers, a multidimensional approach to departmental relationships would determine who a student interacts with, how often, for what purpose, and the quality or satisfaction of these interactions and relationships (Pascarella 1980). A more formal concept of social support provides one possibility for explicitly addressing the multi-dimensional nature of social relationships and social integration in graduate education.

Social support, as usually defined in the medical sociology literature, exists in the *network of relationships* within a given social context. Social support is widely considered as one of the general components in the network of relationships, in addition to social capital and network structure (Berkman et al. 2000; House et al. 1988; Sarason et al. 1990; Vaux 1988). As mentioned earlier, social capital refers both to the actors within a social network, as well as the accumulated capital that these individuals possess. Each person within a network represents a potential access point to socially valued resources and opportunities (House et al. 1988). However, the structure and composition of the relationship patterns between actors is also important. The structure of social networks affects the behavior and attitudes of network members by shaping the flow of resources available to system members, thus influencing their behavioral and emotional responses (Beckman et al. 2000). Social capital and social networks are both often considered structural and more quantitative components that try to capture the level of social integration or embeddedness of an individual within a relationship network. Conversely, social support comprises the more qualitative aspects of social networks that

reflect the content, extent, and quality of the interactions that can or do take place in relationships (House et al. 1988, Sarason et al. 1990, Vaux 1988).[1]

The more qualitative portion of relationships is important to understand because not every potential relationship is activated[2], and not every relationship that is engaged in provides the same level of support, if any (Wellman 1981). Once a potential relationship between network members is recognized, an actor determines the *availability* of resources within that relationship (Dunkel-Schetter and Bennett 1990; Sarason et al. 1990). If and when interactions take place (activation), actors then determine what type of support can be sought in the relationship, what type of support is needed from the relationship, and/or what type of support has been provided or received from the relationship (Dunkel-Schetter and Bennett 1990; Sarason et al. 1990).[3] The type of social support refers to the functional or relational content of the support in terms of instrumental, informational, or emotional aid, relational demands, expectations and conflicts, or the social regulation and control that such support provides (House et. al. 1988). It is the appraisals of these multiple dimensions of *source*, *type*, and *amount* of social support that are typically operationalized and measured (Thoits 1982, 1995). These appraisals not only indicate the perception of receiving support, but also identify

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[1] Social support and social networks are conceptualized and measured in many different ways within the sociological literature, and this is only one of several possibilities. See, for example, White, Boorman & Breiger (1976) for alternative conceptualizations.

[2] Activation here is different than the activation mentioned by Lareau & Horvat (1999) who use the term activation in reference to the use of capital. Here activation indicates engaging in a social relationship that provides access to and possession of capital.

[3] Although measures of perceived support often differ from what supporters report providing, it is the support individuals perceive has been provided that has been consistently found to be closely related to health outcomes (Antonucci & Israel 1986).

specific behavior exchanges and interactions with particular actors that provide this problem-focused or need-based assistance and encouragement (Rook 1990; Thoits 1982).

Because of the connection between social support and social capital within relationship networks and the ways in which they have been conceptualized and defined in the literature, some researchers are beginning to classify social support as social capital that has been converted from potential to actual supportive resources (Stanton-Salazar 1997) or a form of social capital itself (Offer and Schneider 2007). Researchers make these connections based on the idea that like social capital, social support is accessed or activated when the interactions between actors are based on *obligations* or *expectations* embedded in the roles and relationships of the social network. Once activated, social support also provides access to various types of *information* and *resources*. Also, the nature of the activated relationships and interactions is restricted or facilitated by the *norms* of the social context. Furthermore, like social capital, activated social support has the capacity to produce benefits for the receiver, takes time to accumulate, tends to persist, and has the ability to be reproduced and expanded (Offer and Schneider 2007; Stanton-Salazar 1997).

This study takes a similar approach by conceptualizing social support as the resources that are perceived and accumulated from relationships that have been actively engaged in through social interaction. In the context of graduate education, faculty and advisors, through their roles with students, are expected and trusted to provide various types of support. Not every student establishes an active connection with every member of the department, but by being a part of the same general network structure, the potential is there. When activated, student-faculty and student-peer relationships can provide

students with various forms of knowledge-based and instrumental-based assistance, and many of the behaviors in these relationships are governed by and serve to enforce departmental and professional norms. The social support from activated relationships can accumulate and persist over time, and the support can be reproduced and expanded through further interactions; however, social support, as accumulated resources, is different from social capital because social capital cannot be equated with the resources that are acquired through it. Social support and social capital are connected within relationship networks, but they are conceptually distinctive and unique.

If social support is a part of relationship networks along with social capital and network structure, then perceptions of social support should be influenced by the same factors that create and constitute the nature of social networks. The immediate social and institutional contexts shape the ways that relationship networks are created and developed. The characteristics of the individuals within the social network determine the level and quality of the resources that can be available through relationships with each network member. Also, the size, density, and configuration of the network can make it more or less difficult to establish ties with network members (Heller et al. 1990; Offer and Schneider 2007; Stanton-Salazar 1997). Therefore, the source, type, and amount of social support that is perceived must be examined in relation to the roles and structures in which supportive relationships are embedded (Berkman et al. 2000; Heller et al. 1990).

In the organizational context of graduate school, the number of faculty members within a department can represent the number of possible access points to the information and resources that faculty possess, but other departmental and individual factors can influence how easily and how well students may engage in supportive relationships with

faculty. For example, a higher number of students per faculty member may make it more difficult for students to access particular members of the faculty or particularly popular advisors may have difficulty providing support to every student that would like to have them as a mentor. Also, a chemistry department that has established a series of smaller networks based on a laboratory structure may have different expectations as to the role of faculty-student relationships for students and faculty who are not from the same lab. I hypothesize that organizational and individual factors should have a direct impact on the amount of social support that is perceived.

However, researchers also indicate that the focus on social network factors should not exclude the importance of the broader macro-level contexts, which can also influence social support. Social relationships are embedded in social networks, but social networks are embedded in larger social and cultural contexts, which condition and shape the roles and structures of the social network (Berkman et al. 2000; Stanton-Salazar 1997). Broader social norms, socioeconomic factors, sexism, racism, and public policy, all influence the creation of social networks and thus, affects the type and extent of social support that can be accessed by different members of that network (Berkman et al. 2000; Stanton-Salazar 1997). The inability to access, to activate, or to perceive social support may result from the reproduction or reinforcement of broad-based social inequality within the structure and roles of the social network.

Additionally, Lareau and Horvat (1999) and Lin (2000) remind us that there is a difference between capital deficits and return deficits, and both can contribute to the reproduction of inequality. Thus, not only is it important to distinguish between potential resources (social capital) and the obtaining of resources (social support), but it is also

important to distinguish between the accumulation of and return on social support. In the medical sociology literature, social support is usually viewed as a resource with both a direct main effect of improving well-being and an indirect buffering effect based on the interaction of support with an individual level variable such as gender (House et al. 1988, Thoits 1995). The difference in effects not only allows for the possibility that some types of social support are more or less effective for certain types of health outcomes, but also permits the effects of social support on health outcomes to differ by the person being supported (House et al. 1988; Sarason et al. 1990; Vaux 1988). Therefore, I investigate not only if different types of social support are more or less useful for particular socialization outcomes, but I also examine if social support is more or less valuable for men than women in achieving these outcomes.

In one of the only studies examining social support in graduate education, Mallinckrodt & Leong (2001) found not only that female graduate students felt different amounts of social support than men, but also that the effect of this support on stress varied by gender as well. Women perceived themselves as having less cohesion in their families outside the department, receiving less tangible support from their departments and having lower quality relationships with other graduate students (Mallinckrodt & Leong 2001). Also, men experienced direct effects and no buffering effects of social support, whereas women showed no direct effects but did experience buffering effects, suggesting that men and women perceive and use their relationships differently for coping with stressful life events (Mallinckrodt & Leong 2001). Therefore, social support can provide men and women in graduate school with different returns, at least in terms of its effect on stress.

It is important to note that research on social support does recognize that there are objective and subjective aspects of social support. Like many areas of the social sciences, researchers must acknowledge that observable events and behaviors can be very different from individual perceptions of these events and behaviors. A faculty advisor may meet with students regularly, offer feedback, and demonstrate tasks to be completed, but if some students do not perceive these interactions and behaviors as meeting their needs, this advisor could be perceived as supportive by some and unsupportive by others even based on the same observed behaviors. Received support is measured much less often in the literature, but usually focuses on quantitative measures such as how often people interact, membership in organizations, etc. (and often referred to as social integration). It can be difficult to capture the objective aspects of interactions with effective measures, but they are substantively different than the subjective perceptions of these events. This issue of *received* versus *perceived* support becomes particularly important when trying to address issues of access. If access to resources is in reality equal, but is perceived to be unequal, then the problem exists in overcoming the barriers of perceived access rather than actual structural barriers.

Also, social support research recognizes that there are differences in the subjective perceptions of the givers and receivers in social interactions, and most studies typically only include the appraisals of the "supported" side of the supportive relationship. Separate from the actual behaviors and events, differences in perceptions can and do exist between individuals providing social support and those who receive it (Vaux 1988). More than the received support or the perceived intent of the person providing the support, it is the perceived support of the recipient that is found to have the

greatest impact on outcomes, at least with regard to health and well-being (Antonucci and Israel 1986). From a practical perspective this is extremely important, because regardless of whether or not supportive agents are or are trying to be supportive, they may not be perceived as such by the very people they are trying to assist. Thus, interpretations of social support and the effects of social support on other factors must be made in light of the types of supportive measures being utilized.

In this dissertation social support is conceptualized as resources that students perceive through relationships with advisors, faculty, and peers. I suggest that institutional and departmental factors influence the number of possible social ties and the nature of social networks, therefore influencing the perceived access to and activation of social relationships. These differences in perceived access and involvement in relationships are reflected in the differences in perceptions of the sources, types, and amounts of social support. Furthermore, different types of social support are anticipated to be more or less beneficial in their impact on the various dimensions of professional self-concepts. Finally, due to the influence of the larger social and cultural context and the reproductive tendencies of the educational system, gender is expected to influence not only the accumulation of social support, but also the returns on social support. Therefore, social support provides another valuable tool in the study of socialization and the reproduction of inequality in education, and at a level of the educational system that receives far less attention from sociologists and higher education researchers alike.

Chapter 2: Methods

To address the research questions posed in the first chapter, three secondary data sources provide individual, departmental, and institutional measures. Individual measures are taken or constructed entirely from a private dataset entitled the Survey on Doctoral Education (SDE). Department level variables are from two separate sources. First, measures from the 1995 National Research Council report entitled *Research-Doctorate Programs in the United States: Continuity and Change* provide data on the rankings and structural characteristics for each graduate department. Second, using the SDE, averages of aggregated student measures of each department allow for measurement of departmental climates. Institutional characteristics are provided either through the Integrated Postsecondary Education Data System (IPEDS) from the National Center for Educational Statistics or from the SDE.

Data

Survey on Doctoral Education

The Survey on Doctoral Education (SDE) was administered to graduated students in 11 arts and sciences disciplines, from 27 universities and one cross-institutional program (the Compact for Faculty Diversity) during the summer and fall of 1999. Mail and on-line surveys were sent to graduate students in their third year or higher, and with 4,114 respondents had a response rate of 42.3%. The dataset is not publicly accessible, and was collected by the principle investigator, Chris Golde, while she served as a faculty member in the Higher Education department at the University of Wisconsin, Madison. I was granted access by the principle investigator upon receipt of a research proposal.

Before I received the data, all student files were stripped of any individual identifiers and were assigned a unique identification number by SDE staff.

The survey is quite extensive and captures many of the structural, individual, and interactive aspects of graduate education. The survey was more than 20 pages, and from it I extracted data on student perceptions of advisor, faculty, and peer behavior to construct scales of social support. Professional self-concepts were constructed using self-assessments of task preparation and confidence, as well as the preference and expectation to work at different types of institutions. The survey also provided student demographic measures and information on the involvement in and enjoyment of professional activities.

Research-Doctorate Programs in the United States

The 1995 report by the National Research Council entitled *Research-Doctorate Programs in the United States: Continuity and Change* contains information from five main sources: 1) the National Survey of Graduate Faculty 2) data reported from Institutional Coordinators 3) information from federal funding agencies 4) the Doctorate Records file maintained by the NRC and 5) data from the Citation Indexes collected by the Institute for Scientific Information (ISI). The National Survey of Graduate Faculty provides a ranking of graduate departments by discipline with regard to their effectiveness in educating research scholars. Institutional coordinators at each university provided demographic information, such as number of faculty, number of students, etc. for graduate departments that their institution possessed in chosen fields. Also, student demographics are composite records from the NRC Doctorate Records file. Data on faculty funding from federal agencies and publication information from ISI are not

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included in my analyses. All of the data used are publicly available at the NRC webpage as electronic copies of data tables.

Integrated Postsecondary Education Data System

The Integrated Postsecondary Education Data System (IPEDS) from the National Center for Education Statistics (NCES) is a system of surveys that collects data from primary providers of postsecondary education in the United States. Data for this study were extracted from IPEDS using the Peer Analysis System online, which allows researchers to generate reports using selected variables of interest for any available institution. Research expenditure data for 1998 were downloaded for all of the institutions in the sample.

Sample

Data from the SDE underwent two rounds of filtering to provide the samples for this particular study. The first filters were applied to the data used in both samples. Because student level data in the SDE had to be matched with departmental data from the NRC, I had to be confident that a student from a particular program was indeed housed in a particular department. Frequent changes in the life sciences over the last two decades made it difficult to classify departments accurately even within the same institution; therefore students from ecology and molecular biology were dropped from the sample. Also, because of the need to have no missing data above the first level for multilevel modeling, any department was dropped from the sample if there were no NRC data available. This resulted in a base sample of 3,023 students at 26 separate institutions (all students from Marquette and the Compact for Faculty Diversity needed to be excluded).

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These graduate students were enrolled in nine fields of study (English, Philosophy, Art History, History, Sociology, Psychology, Chemistry, Mathematics, and Geology) from 190 different departments. This base sample of 3,023 graduate students is used to analyze the effect of organizational factors on perceptions of social support in Chapter 3, and the effect of gender on perceptions of social support in Chapter 5.

A second filter is necessary to create a sub-sample of the first for the analyses in Chapter 4 and parts of Chapter 5. Based on the format of the questioning in the SDE, students only answered questions about preparation for and confidence in the ability to perform various faculty related tasks if they answered "yes" or "maybe" to the question "Are you considering a faculty job at any point in the future?" Therefore, students who answered "no" to this question had to be excluded from the analyses containing these variables, bringing the number of graduate students for this sub-sample to 2,568.

Measures

In order to obtain some of the measures necessary to carry out the analyses in this study, I combined a number of individual survey items from the SDE into additive scales using a combination of conceptual and empirical methods. Using standard practice (see Kim & Mueller 1978), I established the validity of the scales using factor analysis in which factor components with eigenvalues greater than 1.0 were extracted and subjected to varimax rotation. Then I included any variable with factor loadings above .40 in the scale.[1] I then tested each scale's internal reliability by estimating its Cronbach's alpha.[2]

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[1] Any variable that loaded above .40 on more than one component was included in the scale for the factor on which it had the highest positive loading value.

As a result of factor analysis, a total of 13 outcome scales were constructed, as well as 5

single variable factors based on individual but very high loadings.[3] To keep each scale

on their original metrics, I divided each scale by the number of variables included.

Table 3.1 presents an overview of the data by providing a brief description, the

metric, and source for each of the variables. Table 3.2 provides descriptive statistics for

each variable in both the base sample and sub-sample that will be used in the analyses. A

detailed description of each variable and, when applicable, its construction is provided in

the next section.

Dependent Variables

Outcome Measures of Support

Determining the applicability of social support to a graduate school setting is one

of the primary focuses of this study. The SDE posed a series of questions that asked

students to assess the behaviors of their advisors, faculty, and peers. Although these

individual items were not originally intended to explicitly measure social support, factor

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[2] In one instance two of the variables with a factor loading above .40 were dropped because the internal reliability of the scale (Faculty Care About & Interact With Students) was higher when these variable were excluded (α = .90 rather than .79). Also, one scale was dropped because of low internal reliability (α = .45) and the three loading factors were used as separate and solitary measure of Faculty Do Not Exploit, Students Have an Active Role in Decision Making, and Students Do Not Compete for Faculty Attention.

[3] There were originally four scales for each of the Confidence and Prepared categories of task variables, and in both cases the internal reliability for "Teaching Labs" was too low (α = .44 and .58 respectively) and so these factors were dropped. Also, the specific variables for the two factors related to "Undergraduate Teaching & Service" were inclusive but not grouped the same in the Confidence task categories. For the sake of consistency and comparability, it made sense conceptually to combine the two factors, and since the resulting internal reliability was much higher (Confidence α = .71 together rather than α = .59 and .65 separately), I decided to collapse the two into a single scale. For the Prepared task variables, the original factors loaded strictly according to service, teaching, and research factors, but for the sake of consistency and comparability, scales were constructed using the same variables as the Confidence categories, and the resulting internal reliabilities (Research & Graduate Teaching and Service α = .79 and Undergraduate Teaching & Service α = .81) appears to support this decision.

analysis of these items suggested 9 distinct scales (see Tables 3.1 -3.3 for more details), which capture the multiple dimensions of *source*, *type*, and *amount* of social support that are typically operationalized and measured in the social support research (Thoits 1982, 1995). The four scales of advisor support include personal support, program support, professional development support, and advisor labor expectations. The four faculty scales include faculty inclusiveness, the lack of faculty bias, faculty directiveness, and faculty collaboration. The peer support scale measures student community. These scales are intended to more explicitly label and measure the qualitative aspects of faculty, advisor, and peer behaviors and interactions that can be perceived as providing support.

Advisor Support

By the nature of their role, advisors[4] more than other faculty serve as a primary source of socialization for graduate students. Other higher education research includes measures of faculty interaction, but much of it focuses on interaction with faculty in general, usually asking how often students meet with faculty outside of class. Besides neglecting the particular role that advisors play compared to other faculty, a count of interactions also ignores the fact that interactions with faculty can be qualitatively negative as well as positive. The four scales of advisor support refer to the emotional, programmatic, professional development, and supervisory roles that advisors play in supporting graduate students.

Advisor Support – Personal points to advisor behaviors that provide emotional and non-academic assistance. The six combined questions include: provide emotional support; are sensitive to my needs; take an interest in my personal life; have my best

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[4] "Advisor" is the term being used here for the person considered the primary formal advisor even though others may also call them a research supervisor, dissertation director, dissertation chair, or lab director.

interests at heart; cares about me as a whole person, and would support me in any career path (α = .90).

Advisor Support – Program refers to advisor behaviors that provide instrumental and informational aid to support graduate students in completing their graduate program. The eight questions include: available when I need help with research; available when I need to talk about my program; treat my ideas with respect; give me regular and constructive feedback on my research; teach me the details of good research practice; provide me with information about ongoing research relevant to my work; provide direct assessments of my progress; and, give me regular and constructive feedback on my progress toward degree completion (α = .89).

Advisor Support – Professional Development constitutes advisor behaviors that offer instrumental and informational aid to help a student feel like a colleague and member of the larger profession. The eight questions include: teach me the survival skills for this field; help me secure funding for my graduate studies; help me develop professional relationships with others in the field; assist me in writing presentations and publications; teach me to write grant and contract proposals; advocate for me with others when necessary; provide information about career paths open to me; and, solicit my input on matters of teaching and research (α = .85).

Advisor Support – Labor Expectations refers to advisor behaviors that express relational demands during interactions with students. The two questions include: sees me as a source of labor to advance his/her research; and, expects me to work so many hours that it is difficult to have a life outside of school (α = .67).

Faculty Support

Faculty undoubtedly play a key role in the experiences of graduate students, both in and out of the classroom. Although students have particular advisors, interactions with faculty in general can shape the way students see themselves as valued and accepted as future colleagues, or devalued and blocked from obtaining resources and opportunities in comparison to the perceived "favorite students". The four scales refer to the inclusive, fair, supervisory, and collaborative behaviors that faculty engage in when supporting graduate students.

Faculty Support – Inclusiveness refers to faculty behaviors that provide students with an emotional sense that faculty value them as members of the department. The ten combined questions include: have the best interests of students at heart; make sure that students feel like members of the program; care about the students in the program; treat students with respect; really care about their teaching; really care about advising students; socialize with students; are generous with their time to help students grow as scholars, researchers, and writers; have high ethical standards; and, are accessible to students ($\alpha =$ .90).

Faculty Support – Unbiased indicates that faculty members provide emotional, instrumental, or informational support fairly to everyone. Each of five question is reverse coded and includes: make sexist, racist, or homophobic remarks; give most of the attention and resources to a select group of students; are willing to bend the rules for some students, but not others; seem more concerned with furthering their own careers than with the well-being of the program as a whole; and, there are tensions among program faculty ($\alpha = .71$).

Faculty Support –Directiveness refers to how well and the manner in which faculty members provide instructional and informational support in training and supervising graduate students, especially graduate assistants. The three questions include: are explicit in their expectations of students; carefully supervise teaching assistants; carefully supervise research assistants ($\alpha = .66$).

Faculty Support – Collaboration indicates how well faculty members provide instrumental and informational support in the form of working directly with students on research and publications. The two questions include: value individual research over collaborative research (reverse coded); collaborate with students on publications ($\alpha = .61$).

Peer Support

At both the undergraduate (Astin 1993, Pascarella & Terenzini 1991) and graduate levels (Weidman et al. 2001), peer groups are considered an extremely strong source of socialization and general support. In graduate school there is an initial adjustment to becoming graduate students, as well as a continuous adjustment to becoming members of a profession (Baird 1990, Becker et al. 1961, Golde 2000). Having a community of peers can help provide the support for the transition into one or both of these roles. For this study I created one scale of peer support to be used as an outcome measure.

Peer Support – Community refers to the behaviors of other graduate students that offer emotional, instrumental, and informational aid to help a student feel like a valued member of a cohesive group of peers. The five questions include: sense of solidarity within student cohorts; students freely share information with each other; students have

little contact with each other (reverse coded); experienced students mentor newer

students; and, I am part of a supportive student community in my program ($\alpha = .81$).

Outcome Measures of Future Faculty Tasks

If professional socialization involves the acquisition of the values, norms,

attitudes, skills, self-images, and role tasks of the given profession (Merton 1957), then

outcomes measures of these attitudes, task acquisitions, and self-images are necessary to

determine the effectiveness of the professional socialization process. For graduate

students who possibly plan on becoming faculty members, the acquisition of skills and

abilities related to a faculty position is an indication of successful professional

socialization. From the standpoint of the literature on self-efficacy, a student being

confident that they are able to perform certain tasks is as important as actually being able

to demonstrate those tasks (Bandura 1977, 1982). From a socialization standpoint, the

question arises as to whether students are prepared by their graduate department through

"training" to perform these tasks. To assess these issues, I constructed two outcome

categories (Confidence & Prepared) using SDE data, which contain two scales each. One

scale examines faculty tasks related to research, graduate level teaching and graduate &

professional oriented service. The other scale examines faculty tasks related to

undergraduate level teaching and undergraduate, campus & community oriented service.

Both scales are intended to capture self-assessments of how much students have acquired

aspects of their professional culture, which is considered one dimension of a professional

self-concept (Becker and Carper 1956).

Prepared

Prepared-Research and Graduate & Profession Level Tasks shows if a student perceives that they have been prepared by their department to perform six particular faculty tasks: teaching graduate courses; advising graduate students; reviewing professional papers; conducting research; publishing findings; and, collaborating with others on interdisciplinary research ($\alpha = .79$).

Prepared-Undergraduate & Local Level Tasks indicates if a student perceives that they have been prepared by their department to perform seven particular faculty tasks: teaching lecture courses; teaching discussion sections and courses; articulating a teaching philosophy; creating an inclusive classroom climate; advising undergraduates; serving on departmental and institution-wide committees; and, applying my expertise in service to the community ($\alpha = .81$).

Confidence

Confidence-Research and Graduate & Profession Level Tasks refers to a student's confidence to perform six faculty tasks: teaching graduate courses; advising graduate students; reviewing professional papers, conducting research; publishing findings; and, collaborating with others on interdisciplinary research ($\alpha = .78$).

Confidence-Undergraduate & Local Level Tasks indicates a student's confidence to perform seven faculty tasks: teaching lecture courses; teaching discussion sections and courses; articulating a teaching philosophy; creating an inclusive classroom climate; advising undergraduates; serving on departmental and institution-wide committees; and, applying my expertise in service to the community ($\alpha = .71$).

<u>Outcome Measures of Career Aspirations and Expectations</u>

Besides being part of their professional self-concept, it is important to examine the career aspirations and expectations of graduate students because the occupational position that a person attains is affected by the type of position that they hope and expect to acquire. Becoming a faculty member is a very common outcome of graduate work in the arts and sciences, and is probably the main reason most students attend graduate school. However, in addition to the decision to become a faculty member, students must decide the type of institution at which to establish their careers. The following dependent variables are intended to capture the strength of students' professional identities in terms of what type of institution they would like to or expect to conduct their careers. Professional identities are considered one dimension of a professional self-concept (Becker and Carper 1956).

Career Institution Preference & Expectation

Very Strong Institutional Preference is constructed from a group of four specific questions related to the larger question "At what kind of institution would you <u>prefer</u> to be employed?" and the kind of institutions include: a) Two year community college, b) Four year liberal arts college, with predominantly undergraduates, c) Four year comprehensive university, with undergraduates and master's students, and d) Large university, with undergraduates, master's, and doctoral students. The original responses were 1 = Not at all, 2 = Somewhat, 3 = Very strong. Each specific response was recoded dichotomous with 1 = Very Strong Preference and 0 = No Strong Preference. Based on this coding, measures were then assigned to one of three types of location: strong preference for a single institutional type, a combined strong preference for two

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consecutive institutional types, or no strong preference. Measures where then assigned to

one of three categorical outcomes: 0 = No Strong Preference for Bachelor's or Doctoral

Institutions, 1 = Strong Preference for Bachelor's Institutions, 2 = Strong Preference for

Doctoral Institutions.

High Institutional Expectation is constructed from a group of four specific

questions related to the larger question "At what kind of institution do you think it is

<u>likely</u> that you will be employed?" Following the same recoding procedures as were used

for institutional preference, measures where assigned to one of three categorical

outcomes: 0 = No High Expectations for Bachelor's or Doctoral Institutions, 1 = High

Expectations for Bachelor's Institutions, 2 = High Expectations for Doctoral Institutions.

Student-Level Variables

Because individual level variables are hypothesized to influence the professional

socialization of graduate students, a number of them are included in the analyses of

chapters 4 and 5. Student-level variables fall into six broad categories: student

demographics, social support, social capital, involvement, task enjoyment, task

preparation and confidence. In most analyses, student-level variables are used as controls

in an attempt to isolate the independent effect of particular forms of social support or

gender on outcome variables. An explanation of each category and their individual

variables follows.

<u>Student Demographics</u>

Because this study is only trying to determining if there is inequality in graduate education based on gender, all student demographics, except for gender, are only utilized as control variables. Gender, race/ethnicity/citizenship status, parents' education, age, relationship status, parental status, and stage in the program are each divided into one or multiple dichotomous categories as is appropriate and uses a 1 = yes, 0 = no response to indicate inclusion in that category. Also, I use a missing data category for each component to reduce the amount of data loss that would be necessary if list wise deletion were implemented. The number of years in a program is also included as a continuous measure.

Student demographics were divided into categories as follows. *Gender* is split into female and male with male as the omitted category. *Race/Ethnicity/Citizenship* status is divided into African American, Asian, Hispanic, other, and international student, with white as the omitted category. Citizenship Status is included with race/ethnicity because race was only asked for if the student was a US citizen. *Parent's Highest Level of Education Completed* is split into high school (omitted), bachelors, masters, and doctoral. *Age* is divided into the categories of age in the 20s (omitted), age in the 30s, and age in the 40s or higher. *Relationship status* is split into partnered and single with single as the omitted category. *Parental status* consists of the categories have children and do not have children with not having children omitted. *Stage in the Program* is defined by the categories of pre-qualifying exams (omitted), post-qualifying exams but prior to proposal, post-proposal but before final defense, and post-defense. *Year in Program* is also

included in the student demographics, but is a continuous variable of the number of years

enrolled beginning with year 1 upon entry.

Social Support

Measures of social support do not only serve as outcome measures, but also act as

independent variables that affect professional socialization outcomes. For independent

variables of social support, I use all of the scale measures of social support listed in the

section on outcomes measures with the addition of mean substitution. Two additional

measures, both based on single questions, are also included. *Faculty Support – Do Not*

Exploit is a reverse coding of a single question that asks if students perceive that they are

exploited by the faculty. *Peer Support – Do Not Compete for Attention* is a reverse

coding of a single question that asks students if they must compete with each other for

faculty time and attention.

Social Capital

Although this study is not a network analysis, it does explore the impact of

relationship networks. Many of the organizational variables indicate the size and

composition of institutional and departmental networks. However, there may be

measures of social capital that are not necessarily a universal part of the organizational

structure that affects all students, and may be more a matter of individual choice. I

include three measures of individual social capital as indicators of social capital, both in

and out of the department. One is a dichotomous variable (1 = yes) indicates whether or

not students *Have a Second Advisor or a Faculty Member They Consider a Mentor.* The

second is a continuous variable on a four-point Likert scale that indicates whether

students agree that they are *Part of a Supportive Student Community Outside Their Program.* The final measure of social capital indicates the *Number of Other People Integrated with Their Dissertation Research.* This variable uses the midpoint value of 4 different group sizes ranging from 0-12.

Involvement

Opportunities to take part in professional activities provide an opportunity to practice the roles and skills that contribute to a sense of preparation, confidence, and professional identity (Bandura 1982; Betz and Hackett 1981; Keith and Moore 1995). Therefore, measures of involvement are used as controls when trying to isolate the effects of social support or gender on professional self-concepts. Involvement measures are constructed as a dichotomous variables (1 = yes) and include: *Have Fulfilled a Teaching/TA Requirement, Progressively More Responsible Teaching Roles, Participated in Campus or Department Governance, Presented Research at Regional or National Meetings, Progressively More Responsible Research Roles,* and *Participate in a Professional Internship.*

Task Enjoyment

People who do not enjoy certain tasks tend to avoid them and often perceive themselves as less able to conduct them (Bandura 1977, 1982), and therefore, measures of task enjoyment are used as controls when trying to isolate the effects of social support or gender on professional self-concepts. Measures of *Enjoyment* are continuous variables with responses that range from 1 = I dislike intensely to 5 = I enjoy enormously and include: *Enjoyment of Teaching, Enjoyment of Service,* and *Enjoyment of Research.*

<u>Faculty Tasks</u>

Because the perceived ability to do career related tasks can affect the perception of career options (Betz & Hackett 1981; Correll 2001; Lent et al. 1986), the same four scales of faculty related tasks used for dependent variables are included in subsequent analyses with the addition of mean substitution. All measures of both preparation and confidence are included as controls when exploring the effects of social support or gender on career institution preferences and expectations. However, when analyzing the effect of social support on confidence outcomes, only preparation is used as a control.

Department-Level Variables

Departmental factors influence the membership and structure of the social networks within the departments and, therefore, can help to determine the access to and flow of social support between network members. Department-level independent variables fall into three broad categories: departmental demographics & characteristics, disciplines, and departmental climates. The direct effects of department variables on social support are examined in Chapter 3. In Chapters 4 and 5 department variables are used as controls to help isolate the direct effects of social support and gender on graduate socialization outcomes.

<u>Departmental Demographics & Characteristics</u>

Percentile Rank of Effectiveness is a prestige variable from the NRC that indicates a department's effectiveness in educating research scholars/scientists, and as such can be an indication of a departmental culture that emphasizes research. A score of 100 represents the highest end of the ranking spectrum. *Total Graduate Students* illustrates

the overall size of the department and the number of potential access points to student

relationships and thus access to social capital. *Student/Teacher Ratio* is constructed by

dividing the total number of full- and part-time students in a department by the total

number of full-time departmental faculty. It serves as an indication of potential network

density that can hinder or facilitate student interaction with faculty. *Percent Female,*

Percent Minority, and *Percent Non-US Citizen* refer to the percentage of students

enrolled in each department who identify as female, non-white, or non-citizen based on

the average enrollment over the seven-year period. They are intended to act as measures

of network composition to account for the potential effect of gender, race, and citizenship

in social interaction or social comparison based self-assessments (Berkman et al. 2000).

Percent Research Assistantships and *Percent Teaching Assistantships* are intended to

demonstrate the level of student involvement in research and teaching activities and

departmental priority on these activities. Specifically, they are continuous variables that

indicate the percentage of Ph.D. students from the department who report having each

type of assistantship as their primary source of financial support. Finally, *Median Years*

to Ph.D. is intended to illustrate the typical rate of student progress towards program

completion. If degree completion is an indication of the attainment of satisfactory

professional socialization, this measure potentially serves as a measure of network

effectiveness and efficiency in the provision of social support and professional

socialization.

Disciplines

Although the specific components of the formal curriculum of each department

will vary, there is some continuity between departments of the same discipline based on

the general content covered and the overall perspective of disciplinary analysis (Biglan 1973a, Kuhn 1964). The culture of each discipline is expected to shape the nature of interactions within a department, but in similar ways across departments of the same discipline. I indicate the discipline of each department using nine dichotomous variables (1 = yes): *English, philosophy, art history, history, sociology, psychology, chemistry, mathematics, and geology.*[5]

<u>Departmental Climates</u>

Because organizational climates can have an effect on shaping the attitudes and behaviors of organizational members (Glisson 2000), it is important to include them as factors that potentially influence organizationally based socialization. Climates are an aggregation of shared perceptions that grow through organizational socialization (Louis 1980, Jones & James 1979), and can have multiple dimensions including support, conflict, opportunity, and stress (Glisson 2000). For the purposes of this dissertation, climates are constructed as the departmental means of aggregated student attitudinal measures.

This dissertation examines the effect of departmental climates on the professional self-perceptions of graduate students. This approach finds support in the previous finding that institutional-level climates have an impact on graduate students' academic self-concepts (Hurtado 1994). Climate measures explore the effects of social influence on perceptions of social support (Berkman et al. 2000). Students may confirm or alter their perceptions of support when they compare their attitudes to those of social network members that are most similar to them. For the purposes of this dissertation, departmental climates are not perceived or operationalized as a single component. Using

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[5] Geology is the omitted category in tables reporting results.

a multi-dimensional perspective, departmental climates exist as aggregates of the social

support measures listed as individual level independent variables, as well as one separate

scale and two single measures that are described in the next paragraph.

In addition to the departmental means of the individual variables of social

support, three other climate measures are included. These climates involve perceptions

of faculty attitudes about research, student participation in governance, and the usefulness

of coursework. *Climate - Coursework Useful* is intended to control for the effects that the

skills and knowledge from coursework provides. The effect of coursework could

possibly influence perceptions of support from informal interaction outside of the

classroom or perceptions of preparation and confidence that are not related to social

support. The two questions include: my coursework has laid a good foundation for doing

independent research; and, my coursework has given me a broad foundation of

knowledge, including related fields and subspecialties (α = .66). *Climate – Faculty

Research* is a single measure of the perceived importance that faculty place on their

research. It is intended to serve as a perception of the research culture of the department,

which could influence the nature of student-faculty interactions. *Climate – Student

Governance* is a single measure of perceived student participation in departmental

decision-making. It is intended to illustrate the perception of the faculty's willingness to

view students as future colleagues, which could also affect the way that students and

faculty interact.

Institution-Level Variables

The broader organizational context of the institution can influence the

composition and structure of the relationship networks that are created at the

departmental level. Therefore, aspects of the institutional structure will influence the access and nature of social support. The direct effects of institutional variables on social support are examined in Chapter 3. In Chapters 4 and 5 institutional variables are used as controls to help isolate the direct effects of social support and gender on graduate socialization outcomes.

Three types of institutional variables are included in analyses; control, research expenditures, and future faculty development programs. *Private Control* is a dichotomous variable (1 = yes) that indicates the governance of an institution is conducted through private rather than governmental ownership. Private institutions tend to have higher tuitions and lower enrollments within departments, which may lead to social relationship networks that are different than at public institutions. *Research Expenditures* is a continuous variable of the total amount of money (in millions) spent by a given institution on research and development that was reported to the Nation Center for Educational Statistics (NCES) for the 1998 academic year. Research expenditure can indicate the institutional priority placed on graduate education and research as compared to other institutions. *Future Faculty Development Programs* is a categorical variable that illustrates an institution is taking part in programs specifically designed to foster professional socialization into faculty roles. Three dichotomous variables (1 = yes) indicate whether an institution is taking part in a nationally sponsored program, a locally established program, or no program at all. It is expected that institutions with future faculty development programs may provide greater levels of some forms of support.

Methods of Analysis

I conduct several forms of analysis in each of the results chapters in order to understand the relationship between the numerous variables involved. In Chapter 3 I review the specific components of the factor analysis used to create the various social support outcomes scales. Chapters 3, 4, and 5 contain results of bivariate correlations of each dependent variable with the relevant independent variables. I conduct OLS or multinomial regressions to examine the multivariate effects of organizational factors and gender on perceptions of social support, and the effects of social support and gender on professional socialization outcomes. Control variables are added to subsequent models of analysis in an attempt to account for potentially confounding effects of factors on the dependent variable other than the independent variables being investigated.

Although most of the analyses in each chapter are either OLS or multinomial regressions conducted at the individual level, the data are actually hierarchical, which can lead to specific problems. Graduate students are nested within departments, which themselves are nested within universities. As is typical, I disaggregated the higher level data down to the individual level in order to conduct regression analysis. However, disaggregation increases the number of organizational-level units being analyzed, which can lead to smaller standard errors of the department-level coefficients (Raudenbush and Bryk 2002; Snijders & Bosker 1999). This can result in biased standard errors and potential misinterpretations of significance. I therefore conducted secondary analysis using multilevel modeling techniques as a test of the robustness of the overall effects of variables that used single level regression.

Missing Data Procedures

Missing data at the individual level often necessitate the use of listwise deletion procedures; however, concerns about small samples sizes, especially when using multilevel analysis, make this a less than attractive option. On the other hand, improperly handling missing data can result in biased estimates. To address any concerns of bias that may result from missing data or corrections for it, I utilize a technique that attempts to retain as many cases as possible while also tracking possible biases of these retention efforts. For all continuous independent variables with missing values, I use a mean substitution procedure[6], and then also construct a dichotomous variable that represents individual cases where mean substitution was utilized. For dichotomous and categorical independent variables an additional dichotomous variable or category (1 = yes) is included to indicate missing data. This allows me to test for any possible bias of missing data and/or its substitution.

Limitations

As with any research, the use of particular data, sampling procedures, assumptions, and analytical approaches require an acknowledgement of various limitations, including the ability to draw certain conclusions from the results. This study is no exception, and the following are viewed as some of this study's main limitations. First, the Survey on Doctoral Education provides an excellent opportunity to do what many researchers have been unable to do in the past, analyze students from multiple departments across multiple institutions, but the sample of institutions is not nationally

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[6] Mean substitution is based on the mean of the department rather than the entire sample in an attempt to preserve the relative character of the department group.

representative. This particular sample of graduate departments tends to overemphasize departments that are ranked in the top third of all departments offering similar degrees. This study does illustrate the effect of many institutional and departmental characteristics on the perceptions and self-concepts of graduate students, but caution should be taken when generalizing to other graduate departments in the U.S.

Second, I am using the NRC data for the characteristics of each department because they are they best set of department specific data available, but the data do not match the same time frame that the individual data were collected. Public data on higher education tend to be aggregated at the institutional level. Acquiring the necessary data or any data at the departmental level is very difficult, and is a growing topic of discussion in the study of higher education (AIR 2005). The NRC data available are from the spring of 1993, but the SDE data were collected a full six years later. Although departmental structures tend to remain relatively stable across time, and some of the measures such as the gender and race of graduate students are multi-year averages rather than a single point in time, the departmental structure as described by the NRC data are not the exact structure that is experienced by the students responding to the SDE. Thus, strict interpretation of the effects of organizational structure on student outcomes is not advisable.

Third, as with the use of any secondary data, some measures that are expected to be important or have been shown to be significant in other studies are missing from the available data, which can limit the analyses and interpretations than can be made. For example, in the SDE there are no measures of financial aid. Funding in graduate education has been shown to directly and indirectly affect students' GPA in the first year

(Keith and Moore 1995), involvement in professional activities (Keith and Moore 1995; Nettles and Millett 2006), degree progress (Nettles and Millett 2006), and career aspirations (Keith and Moore 1995; Nettles and Millett 2006). It is possible that levels of individual funding impact the outcomes measures of this study, or may account for some of the effects of the independent variables, and these possibilities should be considered when interpreting results. Another example of missing measures is that none of the datasets have measures of student ability. When researchers analyze self-efficacy, measures of student abilities are often used as controls to clarify differences in perceptions of confidence among students with similar abilities. This is particularly important when trying to identify unequal perceptions of confidence in ability based on race, class and gender. No measures of ability such as grades, SAT or GRE scores are available, which limits the ability to fully determine whether or not differences in self-efficacy based on support or gender are not also because of differences in ability.[7]

Fourth, the sample of students includes only students who are in their third year or higher, meaning the sample in this study is not truly representative of all the students within those departments. Because a large number of students drop out of graduate programs in the first few years (Berelson 1960; Golde 2000; Lovitts 2001), not including them in analysis may alter the ability to determine the complete effect of factors such as social support on professional socialization. Although the data permit the analysis of the effects on those who stayed in graduate school beyond a certain point, it limits the ability

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[7] Since self-efficacy is being measured with respect to confidence in abilities to perform teaching, research, and service tasks, there is some question as to whether or not grades or test scores offer any insights into relevant "abilities"; however, having some general measure of ability would be preferential to none at all. Involvement in these activities attempts to provide some form of control.

to understand the impact of certain factors on all graduate students, including those in their earliest years.

Fifth, measures of social support are entirely based on graduate students' *perceptions* of the behaviors of their advisors, faculty, and peers. Although the use of perceived support is typical of most social support research (Vaux 1988), and the subjective perceptions of the individuals receiving support are the most predictive of related outcomes (Antonucci and Israel 1986), it does limit the ability to make certain types of interpretations from the results. For example, if advisor support is shown to be related to particular outcomes such as task preparation, it cannot be concluded that the actual behaviors or even the intended support of advisors affects task preparation, but rather that the average student perceptions of these behaviors affects task preparation. Students may perceive less support because they are receiving less support, but that cannot be determined with this data. Because results are based on interpretations of behavior rather than on the actual observable actions, this distinction between *perceived* and *received* support becomes even more important when addressing policy and practice implications.

The sixth and probably most significant limitation of this study is that because the data used for this study are cross-sectional, it is possible to determine the significant relationships between variables and their affect on socialization outcomes in a given context, but it is not possible to discuss the effect of certain factors on the process of socialization. Socialization is a process that takes place over time, allowing social capital and social support to accumulate. Relationships that provide social support most likely involve numerous interactions, and the perception of previous support may influence the

nature of future interactions and the support that will be gained from them. Investigating these reciprocal effects are not possible with the present data.

Although these limitations are not insignificant, they are also not insurmountable. This dissertation was designed using the proper methods for the available data in order to address my research questions. This study can provide important insights on the effects of social support on professional socialization outcomes, and is viewed as a first step in my broader research agenda.

Table 2.1 – Description, Metric, and Source of Variables Used for Analysis

Description of Variable	Metric	Source
Dependent Variables		
Social Support		
Advisor Support - Personal	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Advisor Support - Program	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Advisor Support - Professional Development	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Advisor Support - Labor Expectations	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Faculty Support - Inclusiveness	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Faculty Support - Unbiased (reverse coded)	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Faculty Support - Directiveness	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Faculty Support - Collaboration	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Peer Support - Student Community	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Future Faculty Tasks		
Prepared - Undergraduate & Local Level Tasks	Scale of scores 1=Not Very, 2=Somewhat, 3=Very Much	Constructed from SDE
Prepared - Research and Graduate & Professional Level Tasks	Scale of scores 1=Not Very, 2=Somewhat, 3=Very Much	Constructed from SDE
Confidence - Undergraduate & Local Level Tasks	Scale of scores 1=Not Very, 2=Somewhat, 3=Very Much	Constructed from SDE
Confidence - Research and Graduate & Professional Level Tasks	Scale of scores 1=Not Very, 2=Somewhat, 3=Very Much	Constructed from SDE
Career Institution Preference & Expectations		
Very Strong Institutional Preference	0 = No Strong Preference, 1 = Bachelor's College, 2 = Doctoral Institution	Constructed from SDE
High Institutional Expectation	0 = No Strong Preference, 1 = Bachelor's College, 2 = Doctoral Institution	Constructed from SDE
Independent Variables		
Institutional Characteristics		
Private Control	1=Private 0=Public	IPEDS
1998 Total R&D Expenditures	Dollars (X 1,000,000)	IPEDS
Institution has Future Faculty Development Program (National)	1=yes 0=no	SDE
Institution has Future Faculty Development Program (Local)	1=yes 0=no	SDE
Institution does not have Future Faculty Development Program	1=yes 0=no	SDE

[Table 3.1 continued on the next page]

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Table 2.1 (continued) – **Description, Metric, and Source of Variables Used for Analysis**

Description of Variable	Metric	Source
Departmental Characteristics		
Percentile Rank of Effectiveness	Percentage (100%=high rank)	NRC
Total Number of Full- and Part-time Graduate Students 1992	Number	NRC
Student/Faculty Ratio	Number	NRC
% Female Full- and Part-time Students 1992	Percentage	NRC
% Minorities (US Citizens) Receiving PhDs 1986-1992	Percentage	NRC
% Non US Citizens Receiving PhDs 1986-1992	Percentage	NRC
% PhDs having Research Assistantship as Primary Support	Percentage	NRC
% of PhDs having Teaching Assistantship as Primary Support	Percentage	NRC
Median number of years between entry and PhD	Years	NRC
Disciplines		
English Department	1=yes 0=no	SDE
Philosophy Department	1=yes 0=no	SDE
Art History Department	1=yes 0=no	SDE
History Department	1=yes 0=no	SDE
Sociology Department	1=yes 0=no	SDE
Psychology Department	1=yes 0=no	SDE
Chemistry Department	1=yes 0=no	SDE
Mathematics Department	1=yes 0=no	SDE
Geology Department	1=yes 0=no	SDE
Departmental Climates		
Personally Supportive Advising	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
Programmatically Supportive Advising	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
Professionally Supportive Advising	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
High Advisor Workload Expectations	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
Inclusive Faculty	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
Faculty Unbiased (reverse coded)	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
Directive Faculty	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
Collaborative Faculty	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
Faculty Care about Research	1=Strongly Disagree to 4=Strongly Agree	SDE

Table 2.1 (continued) – Description, Metric, and Source of Variables Used for Analysis

Description of Variable	Metric	Source
Departmental Climates (continued)		
Supportive Student Community	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
Students Not Exploited (reverse coded)	1=Strongly Disagree to 4=Strongly Agree	SDE
Students Participate in Governance	1=Strongly Disagree to 4=Strongly Agree	SDE
Students Do Not Compete for Faculty Time (reverse coded)	1=Strongly Disagree to 4=Strongly Agree	SDE
Coursework Useful	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	SDE
Student Demographics & Background Characteristics		
Female	1=yes 0=no	SDE
Male	1=yes 0=no	SDE
African American	1=yes 0=no	SDE
Asian American	1=yes 0=no	SDE
Hispanic	1=yes 0=no	SDE
White	1=yes 0=no	SDE
Other Race/Ethnicity	1=yes 0=no	SDE
International Student	1=yes 0=no	SDE
Parent Highest Ed - HS	1=yes 0=no	SDE
Parent Highest Ed - BA	1=yes 0=no	SDE
Parent Highest Ed - MS	1=yes 0=no	SDE
Parent Highest Ed - Doc	1=yes 0=no	SDE
Age in the 20's	1=yes 0=no	SDE
Age in the 30's	1=yes 0=no	SDE
Age in the 40's or higher	1=yes 0=no	SDE
Partnered	1=yes 0=no	SDE
Single	1=yes 0=no	SDE
Have Children	1=yes 0=no	SDE
Do Not Have Children	1=yes 0=no	SDE
Year in Program	In years	SDE
Stage in Program - Pre-quals	1=yes 0=no	SDE
Stage in Program - Post-quals	1=yes 0=no	SDE
Stage in Program - Post-proposal	1=yes 0=no	SDE
Stage in Program - Post-defense	1=yes 0=no	SDE

[Table 3.1 continued on the next page]

Table 2.1 (continued) – Description, Metric, and Source of Variables Used for Analysis

Description of Variable	Metric	Source
Social Support		
Advisor Support - Personal	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Advisor Support - Program	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Advisor Support - Professional Development	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Advisor Support - Labor Expectations	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Faculty Support - Inclusiveness	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Faculty Support - Unbiased (reverse coded)	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Faculty Support - Directiveness	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Faculty Support - Collaboration	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Faculty Support – Do Not Exploit (reverse coded)	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Peer Support - Student Community	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Peer Support – No Competition for Faculty (reverse coded)	Scale of scores 1=Strongly Disagree to 4=Strongly Agree	Constructed from SDE
Controls		
Social Capital		
Have a Mentor/Second Advisor	1=yes 0=no	SDE
Number of Other People Integrated with Dissertation Research	0=Individually, 1=Close Collaboration with Faculty, 6=Small Group (less than 11), 11=Large Group (11 or more)	SDE
Part of Supportive Student Community Outside Dept	1=Strongly Disagree to 4=Strongly Agree	SDE
Involvement		
Involvement - Have Fulfilled Teaching/TA Requirement	1=yes 0=no	SDE
Involvement - Progressively More Responsible Teaching Roles	1=yes 0=no	SDE
Involvement - Service	1=yes 0=no	SDE
Involvement - Research Presentation	1=yes 0=no	SDE
Involvement - Progressively More Responsible Research Roles	1=yes 0=no	SDE
Involvement - Internship	1=yes 0=no	SDE
Enjoyment		
Enjoyment of Teaching	1=Dislike intensely to 5=Enjoy enormously	SDE
Enjoyment of Service	1=Dislike intensely to 5=Enjoy enormously	SDE
Enjoyment of Research	1=Dislike intensely to 5=Enjoy enormously	SDE

Variable	Mean (base)	SD (base)	N (base)	Mean (sub)	SD (sub)	N (sub)
Dependent Variables						
Social Support - Qualitative						
Advisor Support - Personal	2.78	0.78	2962			
Advisor Support - Program	3.00	0.64	2964			
Advisor Support - Professional Development	2.61	0.68	2961			
Advisor Support - Labor Expectations	1.75	0.78	2958			
Faculty Support - Inclusiveness	2.64	0.53	3007			
Faculty Support - Unbiased (reverse coded)	2.56	0.58	3000			
Faculty Support - Directiveness	2.27	0.61	2967			
Faculty Support - Collaboration	2.29	0.73	2994			
Peer Support - Student Community	2.90	0.61	3005			
Future Faculty Tasks						
Prepared - Undergraduate & Local Level Tasks				1.97	0.50	2528
Prepared - Research and Graduate & Professional Level Tasks				2.02	0.48	2527
Confidence - Undergraduate & Local Level Tasks				2.52	0.36	2532
Confidence - Research and Graduate & Professional Level Tasks				2.38	0.44	2531
Career Aspirations & Expectations						
Very Strong Institutional Preference				0.93	.80	2568
High Institutional Expectation				0.37	.65	2568
Independent Variables						
Institutional Characteristics						
Private Control	0.31	0.47	26	0.31	0.47	26
1998 Total R&D Expenditures (X $1,000,000)	233.02	136.38	26	233.02	136.38	26
Institution has Future Faculty Development Program (National)	0.54	0.51	26	0.54	0.51	26
Institution has Future Faculty Development Program (Local)	0.08	0.27	26	0.08	0.27	26
Institution does not have Future Faculty Development Program	0.38	0.50	26	0.38	0.50	26
Departmental Characteristics						
Percentile Rank of Effectiveness (100% = high)	70.26	24.33	190	70.26	24.33	190
Total number of full- and part-time grad students 1992	84.01	60.36	190	84.01	60.36	190
Student/Teacher Ratio	2.69	1.52	190	2.69	1.52	190
% of Female full- and part-time students 1992	44.68	17.98	190	44.68	17.98	190
% of Minorities (US Citizens) receiving PhDs 1986-1992	5.33	5.51	190	5.33	5.51	190

[Table 3.2 continued on the next page]

Table 2.2 (continued) – Descriptive Statistics for Variables in Base Sample and Sub-samples

Variable	Mean (base)	SD (base)	N (base)	Mean (sub)	SD (sub)	N (sub)
Departmental Characteristics (continued)						
% of Non US Citizens receiving PhDs 1986-1992	16.19	14.78	190	16.19	14.78	190
% of PhDs having Research Assistantship as Primary Support	16.34	21.76	190	16.34	21.76	190
% of PhDs having Teaching Assistantship as Primary Support	35.94	23.29	190	35.94	23.29	190
Median number of years between entry and PhD	9.47	2.63	190	9.47	2.63	190
Disciplines						
English Department	0.13	0.34	190	0.13	0.34	190
Philosophy Department	0.10	0.30	190	0.10	0.30	190
Art History Department	0.07	0.26	190	0.07	0.26	190
History Department	0.12	0.32	190	0.12	0.32	190
Sociology Department	0.11	0.31	190	0.11	0.31	190
Psychology Department	0.13	0.34	190	0.13	0.34	190
Chemistry Department	0.13	0.34	190	0.13	0.34	190
Mathematics Department	0.12	0.32	190	0.12	0.32	190
Geology Department	0.09	0.29	190	0.09	0.29	190
Departmental Climates						
Personally Supportive Advising	2.79	0.30	190	2.79	0.30	190
Programmatically Supportive Advising	3.02	0.26	190	3.02	0.26	190
Professionally Supportive Advising	2.60	0.27	190	2.60	0.27	190
High Advisor Workload Expectations	1.73	0.43	190	1.73	0.43	190
Inclusive Faculty	2.67	0.25	190	2.67	0.25	190
Faculty Unbiased (reverse coded)	2.57	0.26	190	2.57	0.26	190
Directive Faculty	2.26	0.28	190	2.26	0.28	190
Collaborative Faculty	2.27	0.53	190	2.27	0.53	190
Faculty Care about Research	3.53	0.26	190	3.53	0.26	190
Supportive Student Community	2.91	0.29	190	2.91	0.29	190
Students Not Exploited (reverse coded)	2.74	0.40	190	2.74	0.40	190
Students Participate in Governance	2.26	0.36	190	2.26	0.36	190
Students Do Not Compete for Faculty Time (reverse coded)	2.91	0.34	190	2.91	0.34	190
Coursework Useful	1.43	0.20	190	1.43	0.20	190

Variable	Mean (base)	SD (base)	N (base)	Mean (sub)	SD (sub)	N (sub)
Student Demographics & Background Characteristics						
Female	0.52	0.50	3023	0.53	0.50	2568
Male	0.44	0.50	3023	0.46	0.50	2568
African American	0.03	0.16	3023	0.03	0.17	2568
Asian American	0.03	0.17	3023	0.03	0.16	2568
Hispanic	0.03	0.17	3023	0.03	0.18	2568
White	0.72	0.45	3023	0.75	0.43	2568
Other Race/Ethnicity	0.03	0.16	3023	0.03	0.16	2568
International Student	0.09	0.28	3023	0.09	0.28	2568
Parent Highest Ed - HS	0.23	0.42	3023	0.23	0.42	2568
Parent Highest Ed - BA	0.19	0.39	3023	0.20	0.40	2568
Parent Highest Ed - MS	0.34	0.47	3023	0.35	0.48	2568
Parent Highest Ed - Doc	0.20	0.40	3023	0.21	0.41	2568
Age in the 20's	0.44	0.50	3023	0.44	0.50	2568
Age in the 30's	0.41	0.49	3023	0.44	0.50	2568
Age in the 40's or higher	0.10	0.31	3023	0.11	0.31	2568
Partnered	0.53	0.50	3023	0.55	0.50	2568
Single	0.42	0.49	3023	0.43	0.50	2568
Have Children	0.15	0.36	3023	0.16	0.37	2568
Do Not Have Children	0.78	0.42	3023	0.80	0.40	2568
Year in Program	5.89	2.21	3023	5.93	2.25	2568
Stage in Program - Pre-quals	0.09	0.29	3023	0.09	0.29	2568
Stage in Program - Post-quals	0.20	0.40	3023	0.20	0.40	2568
Stage in Program - Post-proposal	0.59	0.49	3023	0.60	0.49	2568
Stage in Program - Post-defense	0.11	0.32	3023	0.11	0.31	2568
Social Support						
Advisor Support - Personal	2.78	0.77	3023	2.81	0.75	2568
Advisor Support - Program	3.00	0.64	3023	3.03	0.63	2568
Advisor Support - Professional Development	2.61	0.67	3023	2.62	0.68	2568
Advisor Support - Labor Expectations	1.75	0.77	3023	1.69	0.74	2568
Faculty Support - Inclusiveness	2.64	0.53	3023	2.66	0.53	2568
Faculty Support - Unbiased (reverse coded)	2.56	0.57	3023	2.56	0.58	2568
Faculty Support - Directiveness	2.25	0.62	3023	2.25	0.63	2568
Faculty Support - Collaboration	2.28	0.73	3023	2.23	0.73	2568
Faculty Support – Do Not Exploit (reverse coded)	2.74	0.80	3023	2.78	0.79	2568
Peer Support - Student Community	2.90	0.61	3023	2.91	0.61	2568
Peer Support – No Competition for Faculty (reverse coded)	2.91	0.79	3023	2.91	0.79	2568

Table 2.2 (continued) – **Descriptive Statistics for Variables in Base Sample and Sub-samples**

Variable	Mean (base)	SD (base)	N (base)	Mean (sub)	SD (sub)	N (sub)
Social Capital						
Have a Mentor/Second Advisor	0.60	0.49	3023	0.62	0.49	2568
Number of Other People Integrated with Dissertation Research	1.94	3.24	3023	1.63	2.96	2568
Part of Supportive Student Community Outside Dept	2.15	0.90	3023	2.17	0.90	2568
Involvement						
Involvement - Have Fulfilled Teaching/TA Requirement	0.48	0.50	3023	0.46	0.50	2568
Involvement - Progressively More Responsible Teaching Roles	0.41	0.49	3023	0.43	0.50	2568
Involvement - Service	0.31	0.46	3023	0.33	0.47	2568
Involvement - Research Presentation	0.68	0.47	3023	0.69	0.46	2568
Involvement - Progressively More Responsible Research Roles	0.36	0.48	3023	0.35	0.48	2568
Involvement - Internship	0.09	0.29	3023	0.08	0.28	2568
Controls						
Enjoyment of Teaching				4.31	0.86	2568
Enjoyment of Service				3.60	0.87	2568
Enjoyment of Research				4.05	0.98	2568

Chapter 3: Social Support as Outcomes

The extant research on graduate student socialization often discusses the importance of relationships between graduate students and faculty as well as peers (Girves & Wemmerus 1988; Golde 2000; Jacks et al. 1983; Lovitts 2001; Wright 1964), but these relationships have never been conceptualized explicitly in terms of social support. Social support measures indicate how interactions with various members of relationship networks provide varying levels of emotional, informational, and instrumental aid, in addition to relational expectations and perceptions of social control. These appraisals of the *source*, *type*, and *amount* of support indicate not only the perception of receiving social support, but also identify specific behavior exchanges and interactions that provide this problem-focused or need-based assistance and encouragement (Rook 1990; Thoits 1982). As such, they offer an excellent tool for exploring the resources embedded in the interactions and relationships within an educational context. However, because the application of social support to graduate education is new, the first research question that I answer in this chapter is:

1. *How can the concepts of social support be applied and operationalized within the context of graduate education?*

This dissertation is not only based on the premise that many of the outcomes of education are affected by the social interactions between members of relationship networks within the educational setting, but also that relationship networks consist of several interrelated components – social capital, network structure, and social support. Therefore, in this chapter, I also explore the connections between measures of social support and the organizational contexts in which they are formed. If social support is a

part of relationship networks along with social capital and network structure, then the access to and perception of social support is influenced by the same factors that create and constitute the nature of social networks. The immediate social and institutional contexts shape the ways that relationship networks are created and developed. The characteristics of the individuals within the social network determine the level and quality of the resources that can be available through relationships with each network member. Also, the size, density, and configuration of the network can make it more or less difficult to establish ties with network members (Heller et al. 1990; Offer and Schneider 2007; Stanton-Salazar 1997). Therefore, the source, type, and amount of social support that is perceived must be examined in relation to the roles and structures in which supportive relationships are embedded (Berkman et al. 2000; Heller et al. 1990).

Entering into a department, graduate students are inserted into a formal social network, with many resources potentially available to them, through relationships with advisors, faculty, and peers; however, because the organizational contexts of graduate schools and graduate departments influence and shape the social capital and network structure of relationship networks, departmental factors also influence how easily and how well students may engage in supportive relationships with department members. Therefore, not all graduate students move through their programs with the same access to potential resources, and as a result, perceive unequal levels of social support. Since, I conceptualize social support as resources accumulated through social relationships, differences in social support result in differences in accumulated capital, which gives some students an advantage over others and leads to inequality in educational outcomes.

Social interaction within graduate school takes place within several organizational contexts where institutional characteristics, departmental characteristics, department discipline, and departmental climates shape how and why people interact. Thus, organizational factors influence the social support that students perceive from advisors, faculty, and peers through the shaping of social networks and the social interaction of its members. Therefore, the second main research question that I answer is:

2. *What are the effects of institutional and departmental context on student perceptions of social support?*

I hypothesize that there are several significant effects of organizational context on social support, but that the strength and direction of that support will vary depending on the nature of the support that is being perceived. Some contextual factors will increase some forms of social support, but will decrease others. Also, because interactions with advisors, faculty, and peers primarily take place within the departmental setting, the effects of departmental context are expected to be larger than those at the institutional level. Therefore, the amount of resources that students accumulate through supportive relationships will vary depending on the institutional and departmental contexts of their graduate education. Because students differentially accumulate capital based on the structure of their departments and institutions, there is structured inequality within graduate education.

Methods

Sample

      This set of analyses uses a sample of The Survey on Doctoral Education (SDE),

utilizing 3,023 respondents from 190 graduate departments at 26 institutions from around

the country. Students are in their third-year or higher and represent the Humanities

(English, Philosophy, Art History), Social Sciences (History, Sociology, Psychology),

and Physical Sciences (Chemistry, Mathematics, Geology). Student data were matched

to departmental data based on the National Survey of Graduate Faculty from the National

Research Council and aggregated climate measures of student level data. Student and

departmental data were then matched to institutional level data from the National Center

for Educational Statistics (NCES). Analysis is conducted using both OLS and multi-level

regression.

Measures of Social Support

      Because determining the applicability of social support to a graduate school

setting is one of the primary goals of this study, analysis in this section focuses the

interpretation of several forms of social support that can be provided to graduate students

by members of their department. In their roles as graduate students, individuals interact

and have relationships with advisors, faculty, and peers. Students then interpret the

relationships and behaviors that result from interactions with these organizational actors

as a means to assess the level of support they are receiving for the enactment of their

roles in these relationships. In other words, through their relationships and interactions

with faculty and other graduate students, students get information and instruction on what

is expected of them as students, peers, and future professionals through the development of professional knowledge, skills, values, and self-concepts, in order to socialize them into the department and the profession.

Using questions from the SDE about the behaviors of advisors, faculty, and peers, I combined a number of individual items into additive scales using a combination of conceptual and empirical methods, in order to assess the applicability of graduate school interactions to the concepts of social support. Using standard practice (see Kim & Mueller 1978), I established the validity of the scales using factor analysis in which factor components with eigenvalues greater than 1.0 were extracted and subjected to varimax rotation. Then, I included any variable with factor loadings above .40 in the scale.[1] I then tested each scale's internal reliability by estimating its Cronbach's alpha.[2] Although these individual items were not originally intended to explicitly measure social support, factor analysis of these items suggested 9 distinct scales, which capture the multiple dimensions of *source*, *type*, and *amount* of social support that are typically operationalized and measured in the social support research (Thoits 1982, 1995). To keep each scale on their original metrics, I divided each scale by the number of variables included. Tables 3.1 through 3.3 summarize the factor loadings, which indicate that perceptions of advisor, faculty, and peer behaviors can validly be conceptualized together explicitly as dimensions of social support.

Table 3.1 illustrates that items pertaining to advisor behaviors can be validly categorized into four distinct scales of social support: program, professional

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[1] Any variable that loaded above .40 on more than one component was included in the scale for the factor on which it had the highest positive loading value.

[2] In one instance two of the variables with a factor loading above .40 were dropped because the internal reliability of the scale (Faculty Support - Inclusive) was higher when these variable were excluded ($\alpha = .90$ rather than .79).

development, personal, and labor expectations. The first two scales focus predominantly

on instrumental and informational aid that advisors provide, with the *program support*

scale emphasizing assistance that will help students complete their course of study, while

the *professional development support* scale centers more on supportive behaviors that

help students to begin their careers as academic professionals. The *personal support*

scale highlights the emotional aid that advisors can provide for their advisees as both

students and people, and the advisor *labor expectations* scale indicates the informal rules

and demands that often accompany and define organizationally based relationships. This

last scale demonstrates the idea that social support refers not only to the content of the

relationship in terms of aid, but also the requirements and expectations for how

interactions will take place and support will be provided. The first three scales are

typically perceived as positive support with the fourth being potentially negative if

demands are perceived as inappropriate. The alphas scores indicate that the reliability for

these four scales is very strong (.67 - .90).

Table 3.2 identifies four valid scales of faculty social support: inclusive, unbiased,

directive, and collaboration.[3] The items from the *inclusive support* scale shows the desire

and action faculty are willing to take to include and interact with students as a legitimate

and valued part of the department. The scale for *unbiased support* demonstrates that

interactions with faculty may not always be perceived as equal or fair for all department

members, illustrating that although faculty have the ability to provide support, they may

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[3] A fifth component was indicated, which consisted of a single item (faculty care about their research), and because unlike "care about their teaching" or "care about advising students" no interaction with students is necessarily inferred through this fifth component, it was not viewed as a measure of support. The departmental mean of this measure is included as a climate variable to indicate focus on doing research on the part of the faculty.

not be viewed as providing the same kind or amount of support to each student. *Faculty directive support* indicates how explicit and careful faculty may be in their expectations and supervision of students in general or as graduate teaching and research assistants. Finally, *collaboration support* can come from faculty in their willingness to work with students on research and publications. These faculty scales indicate not only the provision of certain types of social support, but also the manner in which these interactions are conducted when providing this support. The reliability of these four scales is also very strong with alphas scores ranging from .61 to .90.

Two scales are presented in Table 3.3: community and divisiveness, but only one is considered a valid measure of peer social support.[4] Items for peer *community support* indicate the instrumental, informational, and emotional aid that students can provide for each other when dealing with the demands of graduate school. Divisiveness attempts to illustrate the ways in which students can work against each other in their pursuits; however, this scale appears to be a poor indicator of either positive or negative peer support. Although the item that indicates that students who compete with each other for faculty attention, could be viewed as divisive, the exploitation item indicates interactions with faculty rather than peers. Furthermore, having a role in departmental governance does not necessarily arrive from interaction with peers or provide support for those peers. For these reasons and poor internal reliability ($\alpha = .45$), I separated this scale into its three individual items with each to be used as an independent variable in one or multiple forms. Feeling exploited by faculty is used as an individual and as an aggregated climate factor of faculty support, and competition for faculty attention is used as an individual and

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[4] A third component was indicated, which consisted of a single item (part of a supportive student community outside my program). On its own it is viewed as a measure of social capital rather than social support, and is used as such as a control variable in later analyses.

climate factor of peer support. Although it cannot be classified as support, student participation in governance is aggregated and used as an important measure of departmental climate which may affect student outcomes. The reliability of the peer community social support scale is strong with an alpha score of .81.

These analyses address my first main research question and illustrate that the concept of social support can be applied to the context of graduate school in a logical and meaningful way. The scales that were developed point to the source, type, and amount of assistance and relational demands that result from departmental interaction. As social support they help to indicate with whom students are interacting, the purpose of these interactions, how well these interactions provide the needed or intended assistance, and how equitable or demanding certain relationships may be as compared to others. I now turn to how different components of the graduate school context can influence students' perceptions of these forms of social support.

Results

The effect of organizational context on social support can be relatively strong, but also multidimensional and interrelated, which makes it difficult for any single factor to have an extremely large effect on its own. Students are housed within departments which are housed within institutions. Within and across organizational levels, factors are interrelated and can act upon student outcomes in overlapping ways. If these are all contextual measures that help to shape the relationship networks within departments, a certain level of interconnectedness is to be expected. Table 3.4 presents a Pearson correlation matrix for the organizational variables and social support outcomes to be used

in subsequent analysis. Table 3.4 shows that noticeable overlap does exist between organizational measures. For example, in this sample, privately controlled institutions are less likely to have future faculty development programs, but have more highly ranked departments, and fewer students. However, higher ranking departments tend to have more students, more students per faculty member, fewer female students, and climates of less faculty involvement but more faculty collaboration. However, English departments tend to have fewer students per faculty, as well as a higher percentage of women, a lower percentage of students with research assistantships, and climates of less faculty collaboration than some other disciplines. With such complicated relationships between contextual components, understanding the effect of organizational contexts on individual outcomes such as perceptions of social support becomes equally complex. Although the relatively high correlations between organizational variables do indicate a relatively strong relationship between many organizational factors and social support, the high number of strong relationships makes it more unlikely that any one organizational variable will have a significantly unique impact on social support outcomes once all institutional and departmental factors have been considered.

OLS Regressions of Social Support on Organizational Context

Results of multivariate analysis do indicate that, overall, perceptions of social support in graduate school are influenced by the organizational contexts of the institutions and departments in which the support perceived. However, results also illustrate that some organizational contexts have stronger effects than others, and many of the effects of organizational factors are greatly reduced when other organizational factors

are introduced, indicating that the effect of some factors are due in part to the effect of others. Tables 3.5 through 3.8 are summaries of coefficients from OLS regression models that pertain to the effect of organizational contexts on each of the nine social support scales described above. The tables are divided into four organizational contexts – institutional characteristics, departmental characteristics, disciplines, and departmental climates – to better illustrate the effect of the factors that make up each. Appendices 3A.1 through 3A.9 present all coefficients, including controls, for each model as they pertain to each of the nine support outcome measures. The R^2 statistics from these tables further demonstrate that organizational factors can affect social support, and together all organizational contexts explain 6.5% to 46.4% of the variability in perceptions of social support.

Institutional Characteristics

Overall, institutional characteristic have a relatively small effect on social support, especially since a large proportion of their initial effects are due to the effect of departmental contexts on support. Table 3.5 provides coefficients from the OLS models for the effect of selected institutional characteristics on measures of social support. Examination of Model 1 shows that the majority of the significant effects are negative and a result of private school status and increased research expenditures, but across the nine outcome variables only about a third of institutional characteristics have an initial significant bivariate effect on social support. In Model 2 when institutional characteristics are all entered together, there is little change in the effects from private schools and research expenditures, but changes in future faculty development programs

are much more dramatic (average changes of more than 70%). But, with the addition of

departmental controls in Model 3 almost all the significant effects of institutional

characteristics disappear (effects decrease by an average of more than 75%). As a result

the only remaining significant effects of the institutional context are that private schools

reduce advisor program support, higher research and development expenditures decrease

advisor labor expectations, and national future faculty development programs increase

faculty collaboration support in comparison to schools with no programs.

Examining the effects of specific institutional characteristics on the various forms

of social support, it is clear that some institutional characteristics typically decrease some

forms of support while others characteristics increase support. Although the strength and

significance of most effects disappear with the inclusion of departmental controls,

institutional control and research and development (R&D) expenditures have a similar

negative effect on the same forms of support.   Students at private institutions and

institutions that spend more money on R&D perceive significantly less personal and

programmatic support from their advisors, as well as less inclusive interaction, and less

careful direction from their departmental faculty than their counterparts at public

institutions and lower R&D expenditure schools. The one exception to this pattern is that

students at private schools do feel a greater sense of peer community than at public

schools.

In contrast to private school status and increasing R&D expenditures, Model 1 of

Table 4.5 also shows some positive effects of future faculty development programs on

social support. Schools that have adopted a national or local program have, on average,

students that perceive higher levels of personal and program support from their advisors

and more faculty collaboration than schools with no development programs. However, when private school status and research expenditures are added to the model, the effect of future faculty development programs on advisor personal and program support loose their statistical significance (decrease by at least 28% and 140% respectively). Schools with future faculty development programs also increase perceptions of collaboration support even when taking private school status and research expenditures into account, and although departmental controls decrease these perceptions (by at least 49%), students from schools with nationally based future faculty development programs still feel that they receive significantly more collaboration from faculty than students from schools with no programs at all.

Institutional characteristics do have some effect on social support, potentially through which students and faculty attend and work at these institutions and by establishing the expectations that shape how they should interact within their departments. Private institutions and institutions with higher research expenditures tend to have more highly ranked departments, which may have different expectations for their faculty and students. Students may be expected to be more self-sufficient and expected to need less support, while faculty are expected to focus more on research and less on student advising and supervision. The fact that private schools and schools that have more research expenditures tend to have fewer future faculty development programs, which increase and promote support, lends some credibility to this perspective. Furthermore, students at private schools could have higher peer community support because they need to find in each other the support they do not sense from their advisors and faculty.

Additionally, it is also understandable that institutional effects decrease tremendously with the inclusion of departmental controls. These reductions do not mean that institutional factors do not affect social support, but rather that these effects are not significantly unique because a large proportion of these effects comes from the department level. This is makes sense when considering the fact that social support is based on interaction between organizational actors, and although students, faculty, and advisors interact within an institutional context, the more immediate context that structures the nature of the interaction is departmentally based. Thus, we expect that, although institutional characteristics may have some influence on perceived social support, a large percentage of the effect on support will also come from the departments where the interactions take place.

Departmental Characteristics

Table 3.6 provides coefficients from the OLS models for the effect of selected departmental characteristics on measures of social support. Although many of the coefficients in Table 3.6 appear to be very small, most department characteristics represent percentages or students and thus the coefficients only represent changes in social support resulting from a 1% change in certain departmental factors or an increase of one student in others. Because the range across which these departmental factors can change averages 77 points, changes in social support as a result of any one of these departmental characteristics is potentially very large.

Initially there is a broad impact of departmental characteristics on social support, but once other organizational controls are included, these department characteristics

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impact some sources of social support more than others. Also, most characteristics have both positive and negative effects, depending on which type of social support is being affected. Examination of Model 1 shows that across the nine outcome variables, almost three quarters of department characteristics have an initial significant bivariate effect on social support. However, after including the potentially confounding effects of other organizational factors, departmental characteristics have more of an impact on faculty and peer support than social support received from advisors.

Examination of Model 1 in Table 3.6 reveals a prominent pattern in the direction of influences of departmental characteristics on the four types of advisor support. When the bivariate relationship is significant, increases in departmental rank, number of students, student/faculty ratio, percentage of international students and percentage of students with research assistantships almost exclusively decrease the personal support and the program support that students perceive from their advisors as well as increase the perception of professional development support and workload expectations from advisors. On the other hand increases in a department's percentage of women, minorities, students with teaching assistantships, and the median number of years to the Ph.D. have the opposite effect on advisor support. The only exception to this configuration is that on average increasing the number of graduate students in a department increases rather than decreases the perception of program support that their advisors provide. Because so many of these departmental characteristics are significantly correlated (89%), when all departmental characteristics are entered together in Model 2, the strength of these effects either do not change or diminish enough to result in more than a third fewer significant effects. This means that some of the effects of departmental

characteristics on social support are due to the effect of other departmental characteristics.

Although the patterns in the direction of effects still generally hold, the addition of other organizational factors greatly reduces the size and significance of these effects. With the introduction of other departmental controls (disciplines and climates) in Model 3, the majority of the initial effects diminish even further so that only a fifth of the relationships remain significant. This trend continues with the inclusion of institutional characteristics in Model 4, which causes the effects on personal and program support to decrease in strength (by an average of 46%), and loose statistical significance. After controlling for all organizational contexts, the net effect of departmental characteristics on all forms of advisor support is lower than original levels and only the influence of higher student/faculty ratios to reduce the perceived workload expectations of advisors remains significant. Thus, departmental characteristics can have a significant impact on all four forms of advisor support, but because of strong correlations of departmental characteristics with other aspects of organizational contexts, there is little unique impact of departmental characteristics on perceptions of advisor personal, program, professional development support, and workload expectations.

Model 1 also shows a similar pattern in the direction of the impact of departmental characteristics on the four forms of faculty support. When the bivariate relationship is significant, increases in departmental rank, student/faculty ratio, percentage of international students, and percentage of students with research assistantships almost exclusively decrease student perceptions of inclusiveness and bias on the part of faculty and increase the perception of faculty supervision and collaboration.

On the other hand increases in a department's number of students, percentage of women, minorities, students with teaching assistantships, and the median number of years to the Ph.D. increases perceived faculty inclusiveness and bias and decreases perceptions of good faculty supervision and collaboration. The two exceptions to this general blueprint are that as a department's rank increases, students typically perceive a decrease rather than an increase in faculty supervision, and as the number of students per faculty member increases, student perceptions of faculty bias increases rather than decreases.

In Model 2 when all departmental characteristics are included together, the impact of the original effects typically decreases (25% to more than 300%); however, the two exceptions with rank and student/faculty ratio mentioned above result in a few increased rather than decreased effects. As a result, more than two thirds of the original effects maintain their statistical significance. Still, when discipline and climate controls are added in Model 3, almost three quarters of the effects of departmental characteristics on faculty support either decrease or remain unchanged. Most of the patterns in Model 3 continue into Model 4 with the addition of institutional controls, so that after all organizational controls have been entered almost a quarter of departmental characteristics still have a significant effect on faculty support.

Returning to Model 1 in Table 3.6, the significant effect of departmental characteristics resumes much of the same pattern in the bivariate relationships with peer community support. Higher departmental rank, more students, and a higher percentage of students with research assistantships is associated with perceptions of more student community, whereas higher student faculty ratios, a higher percentage of teaching assistants, and a higher median number of years to degree completion all lower

impressions of peer support. It is interesting to note that, on their own, percentages of women, minorities, and international students in a department have no effect on perceptions of peer community. Very few changes result in Model 2, but the inclusion of other departmental characteristics does account for the reduction (22%) in the effect of median years to degree (MYD) as well as the more than doubling the negative effect of student/faculty ratio on perceived peer support.

In Model 3 the inclusion of discipline and climate controls does cause some increases and decreases in the impact of department characteristics on peer support. For example, with the inclusion of other departmental factors, the positive impact of higher rank on student community and the negative impact of higher student faculty ratios are each reduced (50% and 25% respectively) in Model 3, but the negative impact of median years to degree increases (64%). The few increases or decreases in the influence of department characteristics on peer support in Model 4 are mainly a result of indirect relationships with private schools where students tend to feel a greater sense of community support.

Once all organizational contexts have been controlled for, almost half of the selected departmental characteristics have a significant and unique effect on students' sense of peer support. However, additional analysis illustrates that the number is cut in half when a control for the curvilinear effect of a collaborative climate on peer support is recognized. The change in the size of the relevant coefficients is very small, but the statistical significance of the effect of percent of international students and the median years to degree completion disappears.

Overall, Table 3.6 illustrates that graduate student perceptions of support can be influenced by departmental characteristics in a fairly predictable pattern of effects, but these effects are also very much related to other aspects of the organizational context. Originally, almost three quarters (73%) of the selected department factors had a significant impact on the support of advisors, faculty, and peers, but after considering all possible interrelationships with other organizational contexts only 16% of department characteristics still have a significant effect on social support on their own. It is important, however, to point out that most of these significant effects are on faculty and peer support rather than on advisor support. Thus, departmental characteristics have a greater independent impact on perceptions of faculty and peer support than on perceptions of the support that students receive from advisors. This makes sense from the perspective that the support being perceived from faculty and peers, is based on collective behavior, which would be subject to more influence from departmental composition than any one individual advisor would be. For example, a high student faculty ratio of a department would have a greater overall affect on the perception that faculty in general do not provide many opportunities for collaboration, than the ability of any one faculty member. Any one advisor, because of the nature of their research, personality, or perspective on professional development may provide many more or less opportunities for collaboration as compared to other department faculty.

Disciplines

Disciplines can and do have an effect on student perceptions of social support, and many of these effects are significantly different than the effects of other disciplines.

Also, the effect of disciplines on social support is impacted much more by the relationship of other departmental factors to social support than that of institutional characteristics. Table 3.7 provides coefficients and standard errors from the OLS models for the effect of department discipline on measures of social support. Examination of Model 1 shows that across the nine outcome measures at least half of the disciplines have an initial significant bivariate effect on social support for every outcome except peer support, and there are some patterns in these effects. These patterns from Model 1 are also present in Model 2 with only the slightest variations. The main difference is that in Model 2 the disciplines are entered together, allowing for direct comparisons between disciplines. However, in Model 3 when other departmental factors are included, there are several types of changes that can occur in the established patterns, illustrating that other departmental factors are strongly related to the effect of discipline on social support. Changes in the patterns of effects from Model 3 to Model 4, like the changes between Models 1 & 2 are few and very small, indicating that the relationship of institutional factors to the effect of discipline on social support is not as strong as that of departmental factors. Therefore, there are significant effects of discipline on social support, just as there are also significant differences between disciplines. However, most disciplinary effects are mediated by other organizational factors, particularly departmental ones, which can change the relative strength and significance between disciplines.

Some disciplines do have similar effects on the same type of social support, but they do not always do so in what are thought of as the traditional disciplinary clusters. When I began this study, I hypothesized that individual disciplines would have unique effects on social support, but that some of these effects could also occur in disciplinary

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clusters. Like many researchers, I originally conceptualized disciplines as loosely

conforming to the traditional headings of humanities (English, philosophy, art history),

social science (history, sociology, psychology), and physical sciences[5] (chemistry, math,

geology), but I was also fully aware that history is often referred to as one of the

humanities, and psychology due to having several lab-based subspecialties can be

considered more of a science. Although these alternative conceptualizations of history

and psychology are far from exact, they do appear to great extent in the models,

especially with regard to grouping psychology with chemistry and geology as laboratory

based disciplines.

There are some visible patterns in Model 1 for the effect of disciplines on some

types of social support. Based on the initial bivariate relationships, no strong discernable

patterns are evident for the relationship between disciplines and the perceptions of either

advisor personal support or advisor program support, but perceptions of advisor

professional development support and advisor workload expectations display a very clear

pattern. Greater professional support and labor expectations are most strongly perceived

in the lab disciplines (psychology, chemistry, and geology), and perceived the least in the

humanities (English, philosophy, and art history). History departments are very similar

to the humanities in their negative effect on advisor labor expectations. With regard to

faculty support, students in math and geology departments perceive the highest levels of

inclusion from the faculty, whereas students in the science & lab disciplines (psychology,

chemistry, math, geology) observe the smallest amount of faculty bias. Science & lab

disciplines also identify the highest levels of explicit faculty expectations and

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[5] The life sciences were also originally considered, but many recent changes in classifying biological/life
sciences made it difficult to match departmental and student data with a strong sense of reliability.

supervision, while English and philosophy recognize the least. Likewise, students in the lab disciplines perceive the most faculty collaboration, whereas students in the humanities, including history perceive the least. Finally, departments in the science & lab disciplines provide students with the strongest sense of peer support, and the humanities including history provide the weakest.

There are several types of changes in the patterns of disciplinary effects that occur when other organizational factors are included in the models. Sometimes, as in the case of collaboration, not much happens at all to the direction or significance of effect among disciplines so that once all departmental and institutional factors are controlled, departments in the humanities, including history, are still viewed as providing students with significantly less collaboration on research and publications than the physical sciences, psychology and sociology. Also, chemistry and psychology continue to provide students with more perceived faculty collaboration than sociology, math, or geology. There are some large increases and decreases in the size of disciplinary effects on collaboration that are attributable to other organizational factors, but ultimately they do little to change the order or the differences between these effects.

Something more dramatic happens to the effect of disciplines on perceptions of faculty directiveness when looking at changes across models. Initially Model 2 indicates that students in sociology, English and philosophy departments report receiving less faculty direction than every other discipline, with the exception of the relationship between sociology to art history. Ultimately, however, the end result in Model 4 is that there is no significant difference in the expectations and supervision of faculty by discipline other than between sociology and history. The inclusion of organizational

controls caused the order of most disciplines to change, meaning that organizational

factors affect some disciplines more than others, but because there is no significant

difference between disciplines, these changes accounted for the differences that were

originally between disciplines.

The change in pattern in the effect of discipline on peer community support is

similar in that the relative order of the effects of discipline are almost completely

inverted, but in this case the differences between many of these disciplines are

statistically significant. This means that organizational factors affect some disciplines

more than others causing the relative order of the disciplinary effects change, but unlike

with faculty directiveness, other organizational factors cannot account for the significant

differences in relative effects between disciplines. Although initially only geology

departments provide significantly more peer support than English, philosophy, history

and sociology, after controlling for organizational contexts, perceptions of peer

community are significantly lower in all of the lab disciplines than the humanities and

sociology, and peer support in history is significantly lower than in English, art history

and sociology.

The remainder of the effects of discipline on social support follow a common

pattern in that as they move from Model 2 through Model 4 they experience more

decreases than increases in effect size, and the overall impact does affect the order and

significance of some of the relationships between disciplines. However, these changes do

not alter the relative position or significance of the strongest and weakest disciplinary

effects at least in relation to each other. This indicates that organizational factors do

account for some of the effect of discipline on support, but does so evenly across

disciplines. After taking the variability of departmental and institutional influences into account, the effect of disciplines on the remaining forms of social support can be summarized as follows:

- students in geology departments perceive significantly less personal support from their advisors than students in sociology, psychology, English, history, and chemistry

- the perceptions of advisor program support in geology departments are significantly lower than those in math, sociology and psychology departments; and the perceptions in art history departments are significantly lower than in sociology, English and philosophy

- the lab disciplines and history respectively are perceived to provide the highest levels of professional development support, and this support is significantly higher than that provided to students in philosophy; and, the effects of psychology and history are significantly greater than those in English

- labor expectations of advisors in the lab disciplines are significantly higher than the other disciplines with the exception of geology and art history; also, students in English departments experience significantly lower labor expectations from their advisors than students in math, sociology, art history, and history

- history departments are perceived to have the most inclusive and caring faculty, who are significantly more so than English, sociology, and psychology faculty; and, sociology faculty are the least inclusive being significantly less inclusive than faculty in math, geology, art history, English and philosophy

- chemistry students report the lowest perceptions of faculty bias, which are significantly lower than every discipline except math and psychology; and the other

science and lab disciplines are also significantly lower in their perceptions of faculty

bias than sociology, English, and art history

Overall, Table 3.7 illustrates that disciplines can and do have an effect on student

perceptions of social support and that many of these effects are significantly different

than the effects of other disciplines. Several of these significant differences do form

clusters but most do not allow traditional lines of science vs. social science vs. humanities

to be drawn, at least not completely and clearly. The most prominent cluster is that of the

lab oriented sciences, which is understandable since the disciplinary culture of these

disciplines more strongly structures the nature of interaction into defined groups. For

example, because of the culture of the discipline, collaboration on research is expected in

the lab disciplines, whereas, finding co-authored articles and books in English and

philosophy are much more of an exception than rule, and thus we would expect this

difference in collaboration to exist at the departmental level where disciplinary culture is

manifested at each institution.

Table 3.7 also illustrates that the effect of discipline on social support is impacted

much more by the relationship of other departmental factors on social support than that of

institutional characteristics. Such a result is not surprising from the perspective that

students are being trained as disciplinary professionals by their departments and although

departments from different disciplines may share institutional characteristics and cultures,

the disciplinary cultures that shape the formation and functioning of departments at many

different institutions is going to be much stronger and will provide more similar

departmental experiences and interactions than institutional ones.

<u>Departmental Climates</u>

Departmental climates have a large effect on social support, but climates related to faculty behavior tend to have more of an independent impact on perceptions of social support than climates related to advisors or peers. Table 3.8 provides coefficients from the OLS models for the effect of selected departmental climates on measures of social support. Examination of Model 1 shows that across the nine outcome variables, more than nine out of every ten department climates have an initial significant bivariate effect on social support. This high level of bivariate significance is expected since most climate variables are departmental means of aggregated support measures, and many social support measures are significantly correlated (see Table 3.1). However, it is important to note that the directions of these effects are quite varied, and not always in the direction one might expect. For example, the initial effects of unbiased faculty climates on all forms of support are positive, but climates in which students are not exploited can actually have negative as well as positive effects on some forms of social support.

Also, many of the effects of departmental climates are highly related to the effects of other climates and departmental factors on social support. Just as the high level of significant bivariate relationships in Model 1 was expected, the significant decrease in the size of more than nine out of ten coefficients in Model 2 was also expected. Almost all (96%) of the departmental climates are significantly correlated with each other, so when they are all entered together as a group in Model 2 much of the effect of any one climate on social support is likely to decrease. More than two thirds of climate effects continue to decrease in Model 3 with the inclusion of other departmental factors, and the trend continues into Model 4 with the addition of institutional characteristics, although the size

of the reductions are much smaller. Even with the continuous decreases in the size of the effect of departmental climates on social support, more than a quarter of departmental climates maintain independent significant effects on social support outcomes. Therefore, the effect of departmental climate on social support is due in part to the effect of other organizational factor, but there is still significantly unique effect of several climates on perceptions of support.

Although the size and direction of the effect of climates on the various forms of support differ, the pattern of changes in these effects, with the addition of organizational controls, is quite similar, indicating that the effect of other organizational factors on climates is relatively even. Every departmental climate[6] begins with a significant effect on almost all perceptions of support, but almost half of these effects are no longer significant when the effect of all climates are added simultaneously. With the addition of departmental characteristics and disciplines, the pattern of the significant effect of each type of climate is almost completely fixed. Although most climates had an initial effect, once all other climates and organizational contexts were held constant, the net independent effects of climate on social support can be summarized as follows:

- students from departments with higher overall levels of advisor personal support think that their advisors have lower workload expectations than students from departments with climates of lower levels of personally supportive advising
- students perceive significantly less peer community in departments with more of a climate of advisor program support

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[6] Some outcomes are not included in the models of some climate variables because of problems with colinearity, and are therefore also excluded when referring to significant effects of a particular departmental climate on social support.

- as climates of advisor professional development increase in strength, student perceptions of faculty inclusiveness, faculty directiveness, and peer community support increase as well

- the only significant effect of the climate created by advisor workload expectations is that climates of increased labor expectations decrease the perception that advisors personally support students

- departments that have climates of higher faculty inclusiveness tend to have students who perceive more advisor personal, program and professional development support, as well as increased faculty collaboration and student community support

- students in departments that have unbiased faculty climates tend to view their advisors as less supportive of them personally, programmatically, and with regard to professional development

- climates of careful and explicit faculty direction helps student to perceive significantly more advisor program and professional development support and more faculty collaboration on research and publications

- when students are in departments with stronger climates of faculty collaboration they are more likely to perceive more faculty directiveness

- climates in which faculty are not seen as exploitive significantly decrease perceptions of advisor workload expectations and faculty bias

- despite large initial effects there are no unique influences of peer community and competitive student climates

- climates of student governance increase student perceptions of faculty inclusiveness and reduce perceptions of faculty bias

- stronger research climates tend to reduce perceptions of advisors personal support, but they do increase perceptions of greater faculty collaboration support

- climates in which coursework is seen as useful corresponds with students perceiving that advisors are significantly less supportive with regard to personal, program, and professional development issues; also, faculty are significantly more biased, but are more directive

Overall, Table 3.8 shows that departmental climates have a great deal of an effect on perceptions of social support, but also that many of these effects are highly related to the effects of other climates and departmental factors on support as well (although the effects of supervisory, peer community, and coursework climates appear to be much less related to the effects of other departmental variables). However, the effects of departmental climates on social support are relatively unrelated to the effect of institutional characteristics particularly with regard to climates of student competition and student governance. Furthermore, climates related to faculty behavior tend to have more of an independent impact on perceptions of social support than climates related to advisors or peers. Generalized perceptions about peers are less likely to impact impressions about faculty and advisors, and although generalized attitudes about faculty as a group may be translated by an individual into perceptions of faculty and individual advisors, it appears less likely that students will use the generalized attitudes of others about their specific advisors to form their perspectives of all of the faculty in general or possibly even their advisors.

Secondary Analysis – Multilevel Modeling

Although many of the analyses in this chapter are OLS regressions conducted at

the individual level, the data are actually hierarchical. Graduate students are nested

within departments that are also nested within universities. As is typical, I disaggregated

the higher level data down to the individual level in order to conduct OLS regressions.

However, disaggregation increases the number of level two units being analyzed, which

can lead to smaller standard errors of the department-level coefficients (Snijders &

Bosker 1999). Biased standard errors and potential misinterpretations of significance can

result, therefore I conducted secondary analysis using multilevel modeling techniques as

a test of the robustness of the overall effects of organizational variables and of the

patterns that were reported using OLS. I replicated the analyses that provided the result

for Tables 3.5 – 3.8 using multilevel techniques. As expected, the coefficients and

standard errors were slightly larger, but the basic patterns in relative effect size and

direction of influence remained the same. Both analytical techniques produced similar

results, and thus no reinterpretation of the effects of organizational context on social

support as provided above is needed.

Multilevel analysis also illustrates the overall significant effect of organizational

level factors on social support, and the much more significant effect of departmental

contexts as opposed to institutional ones. Appendix 3B.1 presents the percentage of

variance that exists at each level of analysis for each of the social support outcomes.

Results at the student level explain the variability in social support within departments,

while the remaining percentages refer to the variability in social support that exists

between departments and between universities. Results confirm that a significant amount

of the variability in all forms of social support is a result of department level factors. The

intra-class correlation coefficient (ICC) represents the total variability above the

individual level and thus the amount of difference in the perception of social support that

is a result of all organizational contexts. ICCs range from .047 - .484 (5%-48%) and

show that although the effect of departmental factors is significant for all forms of social

support, the impact of the institutional context is only significant for the perception of

advisor personal and program support, and faculty inclusiveness.[7] Although

departmental and institutional factors contribute to explaining some of the differences in

the graduate student perceptions of advisor support, they help explain much more about

faculty support and almost half of the variability in faculty collaboration. Other types of

faculty support and peer community support result in relatively moderate ICCs (9%-

15%). The impact of organizational contexts on advisor workload expectations is a bit

larger at roughly 23%. Therefore, although the relative size of the impact varies by

source and type of social support, institutional characteristics, departmental

characteristics, disciplines, and climates do have a significant impact on the amount of

social support that graduate students perceive.

Conclusions

Results of analysis in this chapter clearly indicate that interactions within graduate

education can legitimately and usefully be applied to the multiple constructs of social

support. Support comes from multiple sources because it is created through the

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[7] The higher the ICC, the more variability there is between departments, and values above the first level totaling between 5% and 20% are common in educational research (Snijders & Bosker 1999). Although 5% of the variance may seem like a small amount, it can contain statistically and substantively significant effects that can and should be examined.

relationships and interactions with advisors, faculty, and peers. The qualitative content of support varies because it is based on the nature of the relationship or interaction, thus making it possible to obtain emotional, informational, and instrumental forms of assistance (personal, programmatic, etc.). However, social support can also be viewed in terms of how demanding (labor expectations) or fair (unbiased) relationships can be in the provision of support. Levels of support vary because there are differences in how well and/or to what extent these relationships are perceived to provide the aide that is needed or desired. Some faculty members are perceived as kinder or more effective advisors than others, just as faculty in some departments are viewed as more collaborative or as treating graduate students more like future colleagues than in other departments. Therefore, social support is a useful tool for exploring the perception of various types of capital that are contained within the interactions that take place in graduate school.

Analyses in this chapter also indicate that perceptions of social support in graduate school are influenced by the social context of the institutions and departments in which they take place. Results from Intra-class Correlation Coefficients (ICC) as well as changes across models in Tables 3.5 – 3.8 indicate that departmental factors make up a larger percentage of the effect on outcomes of social support than do institutional factors, and together the effects of organizational context account for roughly 5% to 48% of the variance in perceptions of social support. Therefore, institutional characteristics, departmental characteristics, department discipline, and departmental climates together can and do have an overall effect on various measures of social support. This is

extremely important if social support is an indication of the capital that students perceive that they are able to acquire through the interactions with departmental members.

Furthermore, each component of these organizational contexts distinctly influences support by shaping the relationships and interaction processes between students and their advisors, faculty, and peers. Nonetheless, it is important to note that any one organizational factor does not always influence all forms of support in the same way. Granted several measures of organizational context such as private schools do act in a more consistent manner. However, other aspects of the organizational environment are more varied in their effects. Climates of faculty collaboration, for example, do tend to increase advisor support for professional development, but they also tend to decrease advisor personal and program support. Thus, understanding the manner in which different environmental factors shape the relationships and social interaction of organization members can provide greater insight as to how these factors influence perceptions of social support and the access to various forms of capital.

Institutional characteristics can influence the type of faculty and students that work at and attend the university and the priorities and expectations that are set with regard to the emphasis placed on research, teaching, and advising activities. For example, private schools and schools with more money going towards research tend to have advisors that are perceived to provide less personal and programmatic support, have faculty that include students less as part of the department, and provide less explicit direction in terms of expectations and supervision. However, if institutions have some form of future faculty development program, students tend to perceive faculty as more collaborative with regard to research and publications.

Departmental characteristics shape the number and type of departmental members with whom students can interact, and specific factors such as number of students and student faculty ratio can dictate how easy or difficult it may be to establish relationships with other members of the department. For example, the more students there are in a department per faculty member, the potentially fewer resources for any given student with regard to faculty time and attention, thus students tend to perceive less support for every form of support except bias. Factors such as percent research or teaching assistantships can also indicate the priority that departments put on research versus teaching activities, such that students from departments with higher percentages of research assistants tend to identify more collaborative support from faculty, even when taking discipline into account. Because these measure refer to group characteristics of a department it is not surprising that these departmental factors would have a greater impact on the various forms of faculty and peer support than they do on the perception of individual advisor support.

Institutional and departmental characteristics influence support though more explicit structures of interaction; however, disciplines greatly influence the nature of interaction within the department through their latent disciplinary culture. Disciplinary cultures not only determine what subject matters are taught and researched, but also provide a basis by which student and faculty act and interact in these pursuits. Whether referred to as paradigm development (Kuhn 1962; Lodahl & Gordon 1972), normative and functional integration (Hagstrom 1965), or disciplinary consensus (Braxton & Hargens 1996), disciplines differ not only in the methods, problems, and knowledge that they pursue, but also the level of agreement and clarity as to what these methods,

problems, and areas of knowledge are. Disciplines will differ in what and how students need be taught and guided, and thus will, and do differ in the perception of support. There are numerous significant differences between disciplines for every form of social support, and, like departmental characteristics, disciplinary cultures can also influence support through structuring the nature of relationships and interactive networks. For example, lab based disciplines intentionally form small groups that are designed to expect certain behaviors of lab members and provide certain forms of support for them. Therefore, it is not surprising that chemistry, geology, and psychology departments tend to be perceived as providing significantly more professional development, collaboration, workload expectations, and less faculty bias than many other disciplines.

Unlike the explicit structures of institutional and departmental characteristics, or the deeply held latent beliefs and mores of disciplinary cultures, climates are the more manifest and transparent attitudes and perceptions that result from practices, procedures, rewards, and sanctions that are created by the organizational culture (Dennison 1996, Niles-Jolly 1994, Peterson & Spencer 1990). As the general attitudes and perceptions of members of the department, climates provide a form of information and feedback as to how organizational culture, its resulting organizational structures, and previous behaviors of organizational members are likely to impact future behaviors within that particular environment. Most of the climate measures used in this study are departmental means of support measures. Because perceptions of support have a greater impact than actual received support (Sarason, Sarason & Pierce 1990), and support is based on either the availability of support within specific relationships or experience through specific interactions, departmental climates can influence perceptions of support whether or not

students have specific interactions on which to form their perceptions. As such, climates can create the perceived availability of support, influence expectations of receiving support, increase or decrease the likelihood of taking a particular course of action, and serve as the basis for evaluating interactions in relation to the perceived collective experiences of other departmental members. Thus, it is not surprising that, for example, students who come from departments that have climates of faculty inclusiveness and faculty care for research, perceive faculty as significantly more collaborative.

Although each larger component of the organizational context has an effect on outcomes of social support, they are highly interconnected and correlated with each other. Organizations create organizational structures and climates as a result of and as a means to perpetuate the cultures on which they are founded. The connections between organizational components can make it more difficult for any one individual factor to explain much of the influence on graduate student perceptions of social support when all organizational components are included as controls. The dramatic decreases in the size and significance of coefficients in Models 3 and 4 of Tables 3.5 through 3.8 exemplify this point. The fact that any organizational variables maintain a significant independent effect on social support after controlling for all of the other organizational variables is in many ways rather remarkable.

Although organizational factors are extremely interconnected, it does not remove the overall effect that organizational factors have on the accumulation of social support. Organizational contexts do have an impact on graduate student perceptions of support, but it is more of an impact of a complex matrix of overlapping relationships than of any one particular factor. Nonetheless, after taking all other organizational factors into

account, there are effects of organizational context on social support, and most come from the effect of climates and discipline rather than the more explicit organizational structures. Therefore, the accumulation of student capital through supportive relationships will vary depending on the institutional and departmental contexts of their graduate education, meaning that there is structured inequality in graduate education.

These analyses cannot "prove" in a causal sense that certain organizational contexts will increase or decrease access to social support for several reasons. First, this study cannot directly measure actual access to support. Because measures of social support focus on perceptions of support and not the actual support behaviors, it may be possible that students are provided similar opportunities to access support. Perceptions of support may or may not be aligned with the access to actual supportive behaviors, so it is possible that organizational contexts are influencing the perception of the support that is provided just as much or rather than the actual provision of social support. If this is the case, attempts to address the inequality of social support and the accumulation of capital need to be focused on understanding student perceptions of support in addition to structural barriers to it.

Second, it is not possible to determine causality because the data were collected in a cross-sectional manner, which only allows for the examination of the correlations between organizational factors and perceptions of support. Unfortunately, not much can be done to address this limitation. A future study using a longitudinal approach and structural equation modeling may provide some insights to the effect of organizational variables over time between schools. But this approach would provide few new insights within schools because most organizational measures are not going to change much (e.g.

size of dept) or at all (e.g. private control, discipline) during the brief graduate careers of students. Climates can change over shorter periods of time, but are only one part of the departmental context and are closely related to the more permanent aspects of the department.

Another limitation of these analyses is that although the interconnected nature of organizational contexts is complex, using a more streamlined approach to the analyses, which uses fewer independent variables and controls, may make this complexity more manageable. There is always the risk of leaving out too much, but that has to be weighed in relation to how easy it is to interpret the overall effect of organizational contexts or a single category of organizational factors on social support when trying to account for so many highly interconnected individual variables.

Despite some limitations, this study attempts to merge concepts from very disparate areas of study in order to take a new approach in examining the effect of education on social interactions, the accumulation of capital, and inequality. The concept of social support has been used in a limited way in the sociology of education literature, and usually from the perspective of measuring either the buffering effects of support on stress or the main effect on student well-being. This study attempts to conceptualize social support in new ways, and views it as an important outcome measure in its own right that can be influenced by individual and organizational factors. Results of factor analysis provide strong support for the application of social support to the graduate school environment. Analysis using both OLS and multilevel regression methods demonstrate the significant influence that organizational contexts of graduate schools and departments can have on the perceptions of social support. Organizational factors can

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both enhance or limit the amount of social support that students perceive, and tend to affect the perceptions of faculty and peer support more than social support acquired from advisors. These effects can lead to differences in the perception of social support and the accumulation of capital depending on the department or institution that students attend. Therefore, we can conclude that there is some structured inequality in the accumulation of capital in graduate education. The remaining chapters will now demonstrate the important role that social support can play in the social integration and professional socialization of graduate students, and what impact individual factors such as gender have on the perception of social support and student socialization outcomes.

Table 3.1 - Factor Loadings and Alpha Scores for Perceived Advisor Support from Program, Professional Development, Personal, and Labor Interactions with Graduate Advisees

Measure of Advisor Support	Program	Professional Development	Personal	Labor Expectations	
Available for Help with Research	0.751				
Available to Talk about Program	0.711				
Treat My Ideas With Respect	0.442				
Feedback on Research	0.794				
Teaches Good Research Practices	0.639				
Provides Info about Relevant Research	0.569				
Provides Assessment of Progress	0.681				
Feedback on Degree Progress	0.702				
Teaches Survival Skills		0.525			
Helps Secure Funding		0.767			
Helps Develop Professional Relationships		0.698			
Assists with Presentations & Publications		0.583			
Teaches Writing Grants & Proposals		0.733			
Advocates for Me		0.485			
Info about Career Paths		0.490			
Asks Input on Teaching & Research		0.447			
Provides Emotional Support			0.780		
Sensitive to My Needs			0.736		
Interest in My Personal Life			0.823		
Have My Best Interests at Heart			0.627		
Cares about Me as Whole Person			0.826		
Support Any Career Path			0.574		
Sees Me as a Source of Labor				0.819	
Expects Too Many Hours				0.789	Total
% Net Variance Explained	40.555	10.031	5.730	4.476	60.792
Alpha (a)	0.891	0.847	0.899	0.670	

Table 3.2 - Factor Loadings and Alpha Scores for Perceived Faculty Support from Inclusive, Unbiased, Directive, and Collaborative Interactions with Graduate Students

Measure of Faculty Support	Inclusive	Unbiased	Directive	Collaborative	
Have Best Interests of Students at Heart	0.744				
Make Students Feel Like Part of Program	0.667				
Care about Students	0.797				
Treat Students with Respect	0.658				
Care about their Teaching	0.536				
Care about Advising Students	0.696				
Socialize with Students	0.529				
Generous with their Time	0.754				
Have High Ethical Standards	0.567				
Accessible to Students	0.693				
Make Sexist, Racist, or Homophobic Remarks [a]		0.611			
Give Attention to Selected Students [a]		0.716			
Willing to Bend the Rule for Some Students [a]		0.721			
More Concerned about Self than Program [a]		0.404			
Tensions among Program Faculty [a]		0.488			
Explicit in the Expectations			0.521		
Carefully Supervise Teaching Assistants			0.729		
Carefully Supervise Research Assistants			0.681		
Value Individual Research Over Collaboration				-0.781 [b]	
Collaborate with Students on Publications				0.790	Total
% Net Variance Explained	33.941	7.665	6.002	5.079	52.686
Alpha (a)	0.898	0.706	0.660	0.612	

[a] These Measures were reverse coded to indicate positive unbiased support
[b] Negative factor loadings were reverse coded for alpha scores and all further scale calculations

Table 3.3 - Factor Loadings and Alpha Score for Perceived Peer Support from Community and Divisive Interactions of Graduate Students

Measure of Peer Support	Community	Divisive	Total
Cohort Solidarity	0.748		
Share Info with Each Other	0.757		
Have Little Contact	-0.744		
Old Mentor New	0.700		
Part of Supportive Community in Department	0.752		
Students Feel Exploited by Faculty		0.821	
Students Have Active Role in Decisions		-0.629 [a]	
Students Compete for Faculty Attention		0.518	Total
% Net Variance Explained	35.694	12.973	48.668
Alpha (a)	0.810	0.450	

[a] Negative factor loadings were reverse coded for alpha scores and all further scale calculations

Table 3.4 - Pearson Correlation Matrix of Social Support Outcomes with Organizational Context Measures

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23
Y1	1.00	0.64	0.56	-0.32	0.39	0.18	0.22	0.05	0.14	-0.09	-0.07	0.06	0.04	-0.09	-0.10	-0.05	-0.12	0.10	0.07	-0.05	-0.14	0.07	0.14
Y2		1.00	0.66	-0.18	0.43	0.22	0.30	0.10	0.18	-0.11	-0.06	0.04	0.02	-0.05	-0.08	-0.05	-0.10	0.05	0.04	0.01	-0.11	0.08	0.11
Y3			1.00	0.02	0.39	0.19	0.32	0.24	0.25	-0.03	-0.02	0.01	0.03	-0.03	0.00	-0.01	0.01	-0.02	0.00	0.01	0.09	-0.08	-0.05
Y4				1.00	-0.18	-0.14	0.01	0.27	-0.02	0.01	0.00	0.01	0.02	-0.03	0.08	0.08	0.17	-0.16	-0.05	0.11	0.39	-0.19	-0.31
Y5					1.00	0.59	0.51	0.20	0.41	-0.04	-0.05	0.02	-0.01	-0.01	-0.06	-0.06	-0.11	0.01	-0.04	-0.02	-0.06	0.02	0.06
Y6						1.00	0.33	0.20	0.23	0.01	-0.02	-0.01	-0.01	0.01	-0.00	-0.03	-0.06	-0.08	-0.08	0.07	0.04	-0.02	-0.07
Y7							1.00	0.23	0.20	-0.06	-0.05	0.03	0.01	-0.03	-0.05	-0.02	0.01	-0.04	-0.01	0.04	0.06	-0.06	-0.02
Y8								1.00	0.14	-0.06	0.01	0.07	0.03	-0.09	0.09	0.01	0.10	-0.16	-0.01	0.19	0.48	-0.21	-0.39
Y9									1.00	0.06	0.02	-0.02	-0.01	0.03	0.05	-0.04	-0.05	-0.03	-0.01	0.01	0.06	-0.04	-0.07
X10										1.00	-0.04	-0.19	-0.22	0.31	0.29	-0.16	0.17	-0.05	-0.09	0.07	0.10	-0.16	-0.28
X11											1.00	-0.38	-0.08	0.42	0.50	0.33	0.17	-0.12	0.07	-0.01	0.21	-0.08	-0.17
X12												1.00	n/a	n/a	-0.38	-0.16	-0.10	0.06	-0.17	-0.13	-0.07	0.04	0.10
X13													1.00	n/a	-0.09	-0.11	-0.19	-0.04	0.24	0.00	-0.03	-0.02	0.10
X14														1.00	0.44	0.22	0.21	-0.04	0.03	0.13	0.08	-0.03	-0.16
X15															1.00	0.47	0.26	-0.19	0.01	0.12	0.28	-0.08	-0.48
X16																1.00	0.63	-0.19	-0.04	-0.03	0.25	-0.13	-0.21
X17																	1.00	-0.20	-0.13	-0.05	0.51	-0.33	-0.30
X18																		1.00	0.19	-0.50	-0.45	-0.09	0.48
X19																			1.00	-0.01	-0.12	-0.15	0.22
X20																				1.00	0.27	0.22	-0.37
X21																					1.00	-0.45	-0.61
X22																						1.00	0.02
X23																							1.00

[Table 3.4 continued on next page]

Table 3.4 (continued) - Pearson Correlation Matrix of Social Support Outcomes with Organizational Context Measures

	X24	X25	X26	X27	X28	X29	X30	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40	X41	X42	X43	X44	X45	X46
Y1	0.07	-0.01	-0.04	0.04	0.08	0.02	-0.13	0.00	-0.06	0.35	0.25	0.10	-0.16	0.13	0.01	0.04	-0.04	0.07	0.05	0.02	-0.11	0.09	-0.13
Y2	0.04	0.01	-0.06	0.02	0.05	0.02	-0.09	0.05	-0.05	0.24	0.33	0.15	-0.09	0.14	0.05	0.09	-0.01	0.06	0.04	0.06	-0.06	0.08	-0.14
Y3	-0.11	-0.08	-0.02	0.02	-0.02	0.08	0.07	-0.02	0.05	0.10	0.14	0.32	0.11	0.14	0.09	0.19	0.15	-0.03	0.11	0.12	0.03	0.06	-0.03
Y4	-0.22	-0.09	-0.07	-0.16	-0.04	0.11	0.38	-0.05	0.08	-0.23	-0.15	0.18	0.53	-0.09	0.03	0.15	0.37	-0.29	0.05	0.07	0.14	-0.07	0.24
Y5	-0.03	-0.03	0.01	0.08	-0.09	0.04	-0.06	0.07	0.04	0.16	0.17	0.17	-0.07	0.42	0.30	0.23	0.05	0.24	0.19	0.21	0.01	0.18	-0.12
Y6	-0.12	0.00	-0.01	0.02	-0.12	0.06	0.04	0.12	0.04	0.01	0.06	0.11	0.02	0.31	0.44	0.19	0.12	0.23	0.14	0.24	0.07	0.12	-0.07
Y7	-0.13	-0.06	-0.01	0.02	-0.05	0.09	0.06	0.04	0.03	0.06	0.10	0.21	0.10	0.21	0.17	0.38	0.16	0.03	0.11	0.14	0.04	0.07	0.04
Y8	-0.30	-0.13	-0.19	-0.34	0.10	0.29	0.36	0.07	0.13	-0.07	-0.01	0.33	0.50	0.09	0.20	0.31	0.73	-0.22	0.17	0.22	0.20	0.08	0.26
Y9	-0.06	-0.02	0.00	0.00	0.00	0.02	0.02	0.02	0.05	0.07	0.05	0.15	0.04	0.19	0.13	0.12	0.10	0.09	0.42	0.23	0.08	0.10	-0.05
X10	-0.07	0.03	0.08	0.07	-0.02	-0.10	0.04	-0.03	0.02	-0.25	-0.32	-0.10	0.03	-0.08	0.03	-0.11	-0.08	0.16	0.16	0.18	0.30	-0.03	-0.02
X11	-0.05	-0.03	-0.01	0.02	0.05	-0.09	0.05	0.01	0.06	-0.20	-0.20	-0.04	0.00	-0.12	-0.02	-0.13	0.01	-0.00	0.03	-0.12	0.26	0.02	0.05
X12	0.04	-0.02	-0.07	-0.02	-0.02	0.09	0.01	-0.02	-0.05	0.18	0.11	0.02	0.03	0.04	-0.02	0.05	0.11	-0.14	-0.04	0.07	-0.32	-0.04	0.01
X13	-0.07	0.01	0.02	-0.05	0.04	0.06	-0.02	0.02	0.06	0.13	0.08	0.08	0.05	-0.03	-0.03	0.04	0.04	-0.06	-0.03	-0.11	-0.07	-0.06	0.00
X14	0.00	0.02	0.06	0.05	0.00	-0.12	0.00	0.01	0.02	-0.25	-0.16	-0.06	-0.05	-0.03	0.04	-0.07	-0.13	0.18	0.06	-0.01	0.36	0.07	-0.01
X15	-0.03	-0.12	-0.26	0.08	0.03	0.02	0.12	0.00	0.00	-0.28	-0.23	0.04	0.15	-0.13	-0.00	-0.09	0.13	-0.01	0.12	-0.04	0.52	0.01	0.07
X16	0.07	-0.20	-0.22	0.22	-0.16	-0.08	0.32	-0.09	-0.19	-0.15	-0.13	0.00	0.15	-0.14	-0.05	-0.02	0.01	-0.18	-0.11	-0.27	0.16	-0.08	0.13
X17	-0.12	-0.07	0.01	0.00	-0.12	-0.10	0.54	-0.19	-0.17	-0.33	-0.31	0.03	0.32	-0.25	-0.12	0.05	0.14	-0.26	-0.13	-0.21	0.26	-0.05	0.17
X18	0.35	-0.27	0.38	-0.11	0.18	0.36	-0.41	-0.37	-0.23	0.27	0.15	-0.08	-0.29	0.03	-0.20	-0.10	-0.22	-0.01	-0.06	-0.19	-0.07	0.16	-0.05
X19	-0.14	-0.04	-0.05	0.08	0.33	0.17	-0.23	-0.04	-0.14	0.20	0.12	-0.01	-0.09	-0.09	-0.19	-0.01	-0.02	-0.07	-0.04	-0.16	0.09	-0.03	-0.02
X20	-0.22	-0.02	-0.12	-0.21	0.14	-0.31	0.26	0.61	0.04	-0.14	0.04	0.05	0.20	-0.04	0.17	0.12	0.26	0.03	0.02	0.17	0.08	-0.11	0.14
X21	-0.33	-0.17	-0.16	-0.32	0.03	-0.09	0.77	-0.04	0.26	-0.39	-0.32	0.28	0.73	-0.14	0.10	0.18	0.66	-0.38	0.13	0.07	0.33	-0.05	0.35
X22	0.41	0.25	-0.16	-0.08	-0.09	-0.24	-0.23	0.40	-0.16	0.17	0.26	-0.24	-0.35	0.03	-0.04	-0.17	-0.29	0.18	-0.09	0.02	-0.25	-0.05	-0.21
X23	0.25	-0.01	0.30	0.28	0.20	-0.08	-0.60	-0.20	-0.11	0.40	0.30	-0.16	-0.57	0.13	-0.16	-0.07	-0.54	0.17	-0.17	-0.24	-0.34	0.10	-0.32

[Table 3.4 continued on next page]

Table 3.4 (continued) - Pearson Correlation Matrix of Social Support Outcomes with Organizational Context Measures

	X24	X25	X26	X27	X28	X29	X30	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40	X41	X42	X43	X44	X45	X46
X24	1.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.20	0.12	-0.33	-0.41	-0.06	-0.27	-0.33	-0.42	0.06	-0.15	-0.32	-0.21	0.08	-0.17
X25		1.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-0.03	0.04	-0.26	-0.17	-0.07	-0.00	-0.17	-0.18	0.12	-0.05	-0.00	-0.02	0.04	-0.29
X26			1.00	n/a	n/a	n/a	n/a	n/a	n/a	-0.11	-0.18	-0.09	-0.13	0.02	-0.02	-0.02	-0.26	0.18	0.01	-0.06	0.01	-0.05	0.00
X27				1.00	n/a	n/a	n/a	n/a	n/a	0.11	0.05	0.07	-0.30	0.18	0.06	0.05	-0.46	0.22	-0.01	0.02	-0.08	-0.09	-0.21
X28					1.00	n/a	n/a	n/a	n/a	0.21	0.16	-0.05	-0.08	-0.23	-0.27	-0.13	0.14	-0.16	0.01	-0.20	-0.01	0.09	0.01
X29						1.00	n/a	n/a	n/a	0.07	0.06	0.23	0.22	0.10	0.14	0.24	0.40	-0.14	0.04	0.21	0.23	0.11	0.18
X30							1.00	n/a	n/a	-0.37	-0.28	0.23	0.71	-0.14	0.09	0.18	0.50	-0.34	0.05	0.04	0.14	-0.17	0.36
X31								1.00	n/a	0.00	0.15	-0.05	-0.09	0.15	0.28	0.09	0.09	0.29	0.04	0.29	-0.05	-0.05	0.05
X32									1.00	-0.16	-0.15	0.17	0.16	0.10	0.09	0.08	0.18	-0.05	0.12	0.13	-0.03	0.09	-0.03
X33										1.00	0.71	0.30	-0.43	0.38	0.02	0.14	-0.10	0.21	0.15	0.07	-0.31	0.26	-0.36
X34											1.00	0.44	-0.26	0.41	0.14	0.26	-0.01	0.18	0.11	0.18	-0.18	0.24	-0.42
X35												1.00	0.35	0.42	0.26	0.58	0.46	-0.09	0.36	0.36	0.12	0.17	-0.08
X36													1.00	-0.15	0.05	0.29	0.70	-0.53	0.09	0.14	0.26	-0.13	0.44
X37														1.00	0.70	0.55	0.13	0.57	0.45	0.50	0.03	0.42	-0.28
X38															1.00	0.44	0.27	0.52	0.31	0.54	0.16	0.26	-0.14
X39																1.00	0.43	0.06	0.29	0.35	0.12	0.18	0.10
X40																	1.00	-0.30	0.23	0.30	0.27	0.11	0.35
X41																		1.00	0.21	0.32	0.03	0.24	-0.34
X42																			1.00	0.54	0.18	0.25	-0.12
X43																				1.00	0.19	0.11	-0.13
X44																					1.00	0.06	0.09
X45																						1.00	-0.20
X46																							1.00

n/a = Correlation not applicable because of comparison of two dichotomous variables

Legend:

Y1	Advisor Support - Personal	X17	Student/Teacher Ratio	X33	Personally Supportive Advising Climate
Y2	Advisor Support - Program	X18	% Female students	X34	Programmatically Supportive Advising Climate
Y3	Advisor Support - Professional Development	X19	% Minorities (US Citizens)	X35	Professionally Supportive Advising Climate
Y4	Advisor Support – Labor Expectations	X20	% Non US Citizens	X36	Overworked by Advisor Climate
Y5	Faculty Support - Inclusiveness	X21	% PhDs with Research Assistantship	X37	Caring & Inclusive Faculty Climate
Y6	Faculty Support –Unbiased	X22	% PhDs with Teaching Assistantship	X38	Unbiased Faculty Climate
Y7	Faculty Support - Directiveness	X23	Median years between entry and PhD	X39	Careful Faculty Supervising Climate
Y8	Faculty Support - Collaboration	X24	English Department	X40	Collaborative Faculty Climate
Y9	Peer Support - Student Community	X25	Philosophy Department	X41	Students Not Exploited Climate
X10	Private Control	X26	Art History Department	X42	Supportive Student Community Climate
X11	1998 Total R&D Expenditures (X $1,000,000)	X27	History Department	X43	Students Do Not Compete for Faculty Time Climate
X12	Future Faculty Development Program (National)	X28	Sociology Department	X44	Faculty Care about Research Climate
X13	Future Faculty Development Program (Local)	X29	Psychology Department	X45	Students Participate in Governance Climate
X14	No Future Faculty Development Program	X30	Chemistry Department	X46	Coursework Useful Climate
X15	Percentile rank of Effectiveness	X31	Mathematics Department		
X16	Total number grad students	X32	Geology Department		

Table 3.5 - Summary of Coefficients from OLS Regressions of Social Support Measures on Institutional Context and Selected Departmental Controls

Institutional Measure Outcome Measure	Model 1 Bivariate		Model 2 Instit. Measures Grouped [a]		Model 3 Dept Controls [b] added to Model 2	
Private School						
Advisor Support - Personal	-0.152	***	-0.134	***	-0.002	
Advisor Support - Program	-0.147	***	-0.159	***	-0.087	*
Advisor Support - Professional Development	-0.050		-0.042		-0.029	
Advisor - Labor Expectations	0.024		0.053		0.083	
Faculty Support - Inclusive	-0.042	*	-0.061	**	-0.012	
Faculty Support - Unbiased	0.015		0.004		0.050	
Faculty Support - Directive	-0.077	***	-0.085	***	-0.053	
Faculty Support - Collaboration	-0.099	***	-0.042		-0.016	
Peer Support - Student Community	0.082	***	0.084	***	0.034	
R&D Expenditures (x $10,000,000)						
Advisor Support - Personal	-0.004	***	-0.003	**	-0.001	
Advisor Support - Program	-0.003	***	-0.004	***	-0.001	
Advisor Support - Professional Development	-0.000		-0.000		0.000	
Advisor - Labor Expectations	-0.000		0.001		-0.003	*
Faculty Support - Inclusive	-0.002	**	-0.003	**	-0.001	
Faculty Support - Unbiased	0.000		0.000		0.000	
Faculty Support - Directive	-0.002	**	-0.003	**	-0.000	
Faculty Support - Collaboration	0.000		0.003	*	-0.000	
Peer Support - Student Community	0.000		0.000		-0.000	
Future Faculty Development (National)						
Advisor Support - Personal	0.095	***	0.054		0.033	
Advisor Support - Program	0.049	*	-0.020		-0.017	
Advisor Support - Professional Development	0.008		0.003		-0.027	
Advisor - Labor Expectations	0.021		0.060		0.002	
Faculty Support - Inclusive	0.018		-0.029		-0.008	
Faculty Support - Unbiased	-0.007		-0.022		0.010	
Faculty Support - Directive	0.032		-0.011		-0.014	
Faculty Support - Collaboration	0.109	***	0.157	***	0.080	*
Peer Support - Student Community	-0.025		0.000		-0.010	
Future Faculty Development (Local)						
Advisor Support - Personal	0.108	*	0.078		0.112	
Advisor Support - Program	0.052		-0.026		0.025	
Advisor Support - Professional Development	0.073		0.058		0.040	
Advisor - Labor Expectations	0.066		0.118	*	0.017	
Faculty Support - Inclusive	-0.025		-0.069		-0.028	
Faculty Support - Unbiased	-0.020		-0.034		0.030	
Faculty Support - Directive	0.024		-0.020		-0.023	
Faculty Support - Collaboration	0.085		0.160	**	0.003	
Peer Support - Student Community	-0.022		0.010		0.023	

* p = .05, **p = .01, ***p = .001 (two tailed)
[a] No Future Faculty Program is the omitted category when Faculty Development Programs are Grouped
[b] Departmental Controls include departmental demographics, discipline, and climates

Table 3.6 - Summary of Coefficients from OLS Regressions of Social Support Measures on Departmental Characteristics and Selected Institutional and Departmental Controls

Departmental Measure Outcome Measure	Model 1 Bivariates		Model 2 Dept. Char. Grouped		Model 3 Dept. Controls [a] added to Model 2		Model 4 Instit. Controls [b] added to Model 3	
Percentile Rank of Effectiveness								
Advisor Support - Personal	-0.004	***	-0.002	**	-0.002	*	-0.002	
Advisor Support - Program	-0.003	***	-0.002	*	-0.002	*	-0.001	
Advisor Support - Professional Devel.	-0.000		-0.001		0.001		0.000	
Advisor - Labor Expectations	0.003	***	-0.004	***	0.000		0.001	
Faculty Support - Inclusive	-0.001	**	-0.001		-0.001		-0.001	
Faculty Support - Unbiased	0.000		-0.001		-0.001		-0.001	
Faculty Support - Directive	-0.002	**	-0.003	***	-0.001		-0.001	
Faculty Support - Collaboration	0.003	***	-0.004	***	-0.000		0.001	
Peer Support - Student Community	0.002	**	0.002	**	0.001		0.001	
Total Full- and Part-time grad students								
Advisor Support - Personal	-0.001	**	0.001	*	0.001		0.001	
Advisor Support - Program	-0.000	*	0.000	*	0.001	*	0.000	
Advisor Support - Professional Devel.	-0.000		0.000		0.000		-0.000	
Advisor - Labor Expectations	0.001	***	0.000		0.000		0.001	
Faculty Support - Inclusive	-0.000	***	0.000		0.000		0.000	
Faculty Support - Unbiased	0.000		0.000		0.001	***	0.001	***
Faculty Support - Directive	-0.000		0.000		-0.000		-0.001	
Faculty Support - Collaboration	0.000		0.000		0.000		0.000	
Peer Support - Student Community	-0.000	*	-0.000	*	0.001	*	0.001	*
Student/Faculty Ratio								
Advisor Support - Personal	-0.048	***	-0.037	***	-0.027	*	-0.021	
Advisor Support - Program	-0.035	***	-0.026	**	-0.023	*	-0.010	
Advisor Support - Professional Devel.	0.003		-0.023	*	-0.008		-0.001	
Advisor - Labor Expectations	0.072	***	-0.022	*	-0.026	*	-0.041	**
Faculty Support - Inclusive	-0.032	***	-0.041	***	-0.015		-0.016	
Faculty Support - Unbiased	-0.018	***	-0.043	***	-0.042	***	-0.048	***
Faculty Support - Directive	0.004		-0.008		0.033	**	0.039	***
Faculty Support - Collaboration	0.037	***	-0.077	***	-0.027	**	-0.024	*
Peer Support - Student Community	-0.017	**	-0.036	**	-0.027	*	-0.031	*
% Female								
Advisor Support - Personal	0.005	***	0.001		-0.000		0.000	
Advisor Support - Program	0.002	**	0.001		0.002		0.002	
Advisor Support - Professional Devel.	-0.001		0.000		0.000		0.001	
Advisor - Labor Expectations	-0.007	***	0.002	*	-0.000		-0.000	
Faculty Support - Inclusive	0.000		-0.001		0.002		0.002	
Faculty Support - Unbiased	-0.003	***	-0.002	**	0.003	*	0.003	
Faculty Support - Directive	-0.001	*	-0.001		-0.001		-0.001	
Faculty Support - Collaboration	-0.007	***	0.006	***	-0.001		-0.001	
Peer Support - Student Community	-0.001		-0.001		-0.001		-0.001	
% Minorities								
Advisor Support - Personal	0.011	***	0.007	*	0.004		0.003	
Advisor Support - Program	0.005	*	0.003		-0.001		-0.002	
Advisor Support - Professional Devel.	-0.000		-0.000		-0.001		-0.003	
Advisor - Labor Expectations	-0.008	**	0.002		-0.001		0.000	
Faculty Support - Inclusive	0.000		-0.007	***	-0.001		-0.001	
Faculty Support - Unbiased	-0.010	***	-0.010	***	-0.006	**	-0.006	**
Faculty Support - Directive	-0.001		-0.001		0.002		0.002	
Faculty Support - Collaboration	-0.002		0.007	**	-0.006	*	-0.004	
Peer Support - Student Community	-0.002		-0.002		0.004		0.003	

[Table 3.6 continued on next page]

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Table 3.6 (continued) - Summary of Coefficients from OLS Regressions of Social Support Measures on Departmental Characteristics and Institutional and Departmental Controls

Departmental Measure Outcome Measure	Model 1 Bivariates		Model 2 Dept. Char. Grouped		Model 3 Dept. Controls [a] added to Model 2		Model 4 Instit. Controls [b] added to Model 3	
% Non US Citizens								
Advisor Support - Personal	-0.003	**	-0.001		0.000		0.001	
Advisor Support - Program	0.001		0.002		0.002		0.002	
Advisor Support - Professional Devel.	0.001		-0.000		0.001		0.001	
Advisor - Labor Expectations	0.007	***	-0.000		0.000		-0.001	
Faculty Support - Inclusive	-0.001		-0.001		0.000		-0.000	
Faculty Support - Unbiased	0.003	***	0.002		0.001		0.001	
Faculty Support - Directive	0.002	*	0.002		0.002		0.002	
Faculty Support - Collaboration	0.011	***	0.003	*	-0.000		-0.000	
Peer Support - Student Community	0.000		-0.002		-0.003	*	-0.003	*
% Research Assistantships								
Advisor Support - Personal	-0.005	***	-0.000		0.002		0.002	
Advisor Support - Program	-0.003	***	-0.000		0.000		-0.000	
Advisor Support - Professional Devel.	0.002	***	0.002	*	0.000		0.000	
Advisor - Labor Expectations	0.013	***	0.011	***	0.002		0.003	
Faculty Support - Inclusive	-0.001	***	-0.000		0.001		0.001	
Faculty Support - Unbiased	0.001	*	-0.001		0.002		0.003	*
Faculty Support - Directive	0.002	***	0.001		-0.002		-0.002	
Faculty Support - Collaboration	0.015	***	0.014	***	0.004	**	0.003	**
Peer Support - Student Community	0.001	**	0.001	**	0.001		0.002	
% Teaching Assistantships								
Advisor Support - Personal	0.002	***	0.002		0.000		0.001	
Advisor Support - Program	0.002	***	0.002	*	0.000		-0.000	
Advisor Support - Professional Devel.	-0.002	***	-0.002	**	-0.000		-0.000	
Advisor - Labor Expectations	-0.007	***	-0.002	*	0.001		0.001	
Faculty Support - Inclusive	0.000		-0.001		0.001		0.001	
Faculty Support - Unbiased	-0.001		-0.003	***	0.000		0.001	
Faculty Support - Directive	-0.002	***	-0.002	**	0.001		0.000	
Faculty Support - Collaboration	-0.007	***	-0.002	**	0.000		0.000	
Peer Support - Student Community	-0.001	*	-0.001	*	-0.001		-0.001	
Median Years to Complete PhD								
Advisor Support - Personal	0.046	***	0.019	*	-0.003		-0.004	
Advisor Support - Program	0.028	***	0.017	*	0.007		-0.001	
Advisor Support - Professional Devel.	-0.013	*	-0.009		0.001		-0.003	
Advisor - Labor Expectations	-0.099	***	-0.062	***	0.004		0.013	
Faculty Support - Inclusive	0.013	**	0.007		0.020	**	0.020	*
Faculty Support - Unbiased	-0.017	***	-0.017	*	0.014		0.018	
Faculty Support - Directive	-0.004		-0.004		0.023	*	0.019	
Faculty Support - Collaboration	-0.119	***	-0.083	***	-0.006		-0.005	
Peer Support - Student Community	-0.018	***	-0.014	***	-0.023	*	-0.021	*

  *   p = .05, **p = .01, ***p = .001 (two tailed)
  [a] Departmental Controls include discipline and climates
  [b] Institutional Controls include governance, research expenditures, and future faculty development programs

Table 3.7 - Summary of Coefficients and Standard Errors from OLS Regressions of Social Support Measures on Departmental Discipline and Selected Institutional and Departmental Controls

Outcome Measure Discipline	Model 1 Bivariates			Model 2 Disciplines Grouped[c]			Model 3 Dept. Controls[a] added to Model 2			Model 4 Instit. Controls[b] added to Model 3		
Advisor Support - Personal												
English	0.157	0.039	***	0.342	0.075	***	0.305	0.142	*	0.305	0.147	*
Philosophy	-0.033	0.065		0.179	0.091	*	0.182	0.134		0.202	0.136	
Art History	-0.143	0.062	*	0.075	0.089		0.178	0.161		0.175	0.162	
History	0.078	0.036	*	0.274	0.074	***	0.268	0.130	*	0.277	0.134	*
Sociology	0.180	0.043	***	0.368	0.077	***	0.383	0.114	***	0.382	0.116	***
Psychology	0.047	0.041		0.250	0.076	***	0.362	0.121	**	0.346	0.122	**
Chemistry	-0.261	0.036	***	-0.002	0.074		0.228	0.094	*	0.201	0.095	*
Math	0.007	0.059		0.216	0.087	*	0.181	0.119		0.168	0.120	
Geology	-0.220	0.069	***	--			--			--		
Advisor Support - Program												
English	0.076	0.032	*	0.217	0.062	***	0.176	0.119		0.232	0.123	
Philosophy	0.039	0.054		0.190	0.076	*	0.210	0.112		0.245	0.113	*
Art History	-0.157	0.052	**	0.004	0.074		-0.021	0.134		0.005	0.135	
History	0.026	0.030		0.174	0.061	**	0.134	0.108		0.187	0.112	
Sociology	0.101	0.036	**	0.242	0.065	***	0.255	0.095	**	0.281	0.096	**
Psychology	0.036	0.034		0.184	0.064		0.185	0.101		0.169	0.102	
Chemistry	-0.154	0.030	***	0.027	0.061		0.164	0.078	*	0.140	0.079	
Math	0.124	0.049	**	0.269	0.072	***	0.257	0.099	**	0.268	0.100	**
Geology	-0.160	0.057	**	--			--			--		
Advisor Support - Professional Development												
English	-0.202	0.034	***	-0.337	0.065	***	-0.257	0.125	*	-0.206	0.129	
Philosophy	-0.253	0.057	***	-0.408	0.079	***	-0.314	0.117	**	-0.279	0.119	*
Art History	-0.063	0.054		-0.226	0.078	**	-0.100	0.141		-0.077	0.142	
History	0.026	0.031		-0.146	0.064	*	-0.096	0.114		-0.047	0.118	
Sociology	-0.037	0.038		-0.199	0.067	**	-0.117	0.100		-0.089	0.101	
Psychology	0.155	0.036	***	-0.032	0.066		0.035	0.106		0.041	0.107	
Chemistry	0.122	0.031	***	-0.067	0.064		0.075	0.082		0.064	0.083	
Math	-0.042	0.051		-0.206	0.075	**	-0.123	0.104		-0.110	0.105	
Geology	0.174	0.060	**	--			--			--		
Advisor – Labor Expectations												
English	-0.464	0.038	***	-0.690	0.068	***	-0.450	0.138	***	-0.496	0.140	***
Philosophy	-0.325	0.066	***	-0.608	0.083	***	-0.368	0.133	**	-0.370	0.135	**
Art History	-0.242	0.063	***	-0.528	0.081	***	-0.235	0.150		-0.222	0.151	
History	-0.326	0.036	***	-0.564	0.067	***	-0.283	0.122	*	-0.321	0.126	*
Sociology	-0.101	0.044	*	-0.389	0.070	***	-0.260	0.113	*	-0.276	0.114	*
Psychology	0.259	0.041	***	-0.076	0.069		0.061	0.115		0.058	0.116	
Chemistry	0.762	0.034	***	0.320	0.067	***	0.345	0.084	***	0.342	0.085	***
Math	-0.162	0.059	**	-0.452	0.079	***	-0.234	0.116	*	-0.219	0.117	
Geology	0.314	0.069	***	--			--			--		
Faculty Support - Inclusive												
English	-0.037	0.026		-0.136	0.052	**	-0.019	0.100		-0.024	0.103	
Philosophy	-0.076	0.043		-0.177	0.062	**	-0.016	0.097		-0.020	0.098	
Art History	0.016	0.043		-0.090	0.061		-0.034	0.107		-0.032	0.108	
History	0.105	0.025	***	-0.019	0.051		0.083	0.089		0.077	0.092	
Sociology	-0.145	0.029	***	-0.233	0.053	***	-0.190	0.080	*	-0.192	0.081	*
Psychology	0.064	0.028	*	-0.050	0.053		-0.089	0.083		-0.093	0.083	
Chemistry	-0.085	0.025	***	-0.175	0.051	***	-0.052	0.062		-0.048	0.063	
Math	0.145	0.040	***	0.031	0.060		-0.029	0.084		-0.022	0.085	
Geology	0.110	0.047	*	--			--			--		

[Table 3.7 continued on next page]

Table 3.7 (continued) - Summary of Coefficients and Standard Errors from OLS Regressions of Social Support Measures on Departmental Discipline and Selected Institutional and Departmental Controls

Outcome Measure	Model 1 Bivariates			Model 2 Disciplines Grouped[c]			Model 3 Dept. Controls[a] added to Model 2			Model 4 Instit. Controls[b] added to Model 3		
Faculty Support - Unbiased												
English	-0.184	0.028	***	-0.273	0.055	***	-0.253	0.109	*	-0.276	0.112	*
Philosophy	0.006	0.047		-0.113	0.067		-0.082	0.105		-0.091	0.107	
Art History	-0.034	0.046		-0.151	0.066	*	-0.213	0.117		-0.218	0.118	
History	0.037	0.027		-0.089	0.055		-0.073	0.097		-0.090	0.100	
Sociology	-0.210	0.032	***	-0.303	0.057	***	-0.187	0.088	*	-0.199	0.089	*
Psychology	0.108	0.031	***	-0.025	0.057		0.052	0.090		0.057	0.090	
Chemistry	0.060	0.027	*	-0.070	0.055		0.141	0.068	*	0.143	0.069	*
Math	0.291	0.044	***	0.155	0.065	*	0.037	0.092		0.026	0.093	
Geology	0.124	0.051	*	--			--			--		
Faculty Support - Directive												
English	-0.212	0.030	***	-0.262	0.059	***	-0.000	0.119		0.029	0.123	
Philosophy	-0.176	0.050	***	-0.251	0.071	***	-0.037	0.115		-0.023	0.116	
Art History	-0.016	0.049		-0.099	0.070		0.044	0.128		0.054	0.129	
History	0.033	0.029		-0.057	0.058		0.089	0.105		0.111	0.108	
Sociology	-0.085	0.034	*	-0.158	0.061	**	-0.109	0.096		-0.092	0.097	
Psychology	0.162	0.032	***	0.056	0.060		-0.034	0.098		-0.039	0.098	
Chemistry	0.094	0.029	***	-0.007	0.058		-0.073	0.074		-0.077	0.075	
Math	0.089	0.046		-0.000	0.068		-0.080	0.099		-0.067	0.101	
Geology	0.088	0.054		--			--			--		
Faculty Support - Collaboration												
English	-0.600	0.035	***	-0.952	0.054	***	-0.663	0.105	***	-0.685	0.107	***
Philosophy	-0.440	0.059	***	-0.866	0.065	***	-0.550	0.101	***	-0.558	0.102	***
Art History	-0.617	0.057	***	-1.032	0.065	***	-0.679	0.112	***	-0.691	0.112	***
History	-0.633	0.032	***	-0.965	0.054	***	-0.721	0.090	***	-0.748	0.092	***
Sociology	0.218	0.040	***	-0.258	0.056	***	-0.001	0.089		-0.032	0.090	
Psychology	0.619	0.037	***	0.086	0.055		0.248	0.089	**	0.206	0.090	*
Chemistry	0.678	0.032	***	0.104	0.054		0.173	0.068	*	0.149	0.069	*
Math	0.199	0.055	***	-0.262	0.063	***	-0.114	0.091		-0.140	0.092	
Geology	0.469	0.065	***	--			--			--		
Peer Support - Student Community												
English	-0.107	0.030	***	-0.229	0.060	***	0.295	0.118	*	0.287	0.122	*
Philosophy	-0.062	0.050		-0.198	0.072	**	0.281	0.113	*	0.280	0.115	*
Art History	0.005	0.049		-0.134	0.071		0.342	0.126	**	0.344	0.127	**
History	-0.001	0.029		-0.140	0.059	*	0.141	0.105		0.140	0.109	
Sociology	0.009	0.034		-0.131	0.062	*	0.305	0.096	***	0.304	0.097	**
Psychology	0.028	0.032		-0.115	0.061		-0.010	0.099		0.002	0.099	
Chemistry	0.030	0.029		-0.115	0.059		0.029	0.075		0.035	0.076	
Math	0.047	0.046		-0.095	0.070		0.144	0.099		0.144	0.101	
Geology	0.146	0.055	**	--			--			--		

* p = .05, **p = .01, ***p = .001 (two tailed)
[a] Geology is the omitted category when disciplines are entered as a group
[b] Departmental Controls include organizational characteristics and climates
[c] Institutional Controls include governance, research expenditures, and future faculty development programs

Table 3.8 - Summary of Coefficients from OLS Regressions of Social Support Measures on Departmental Climates and Selected Institutional and Departmental Controls

Departmental Measure Outcome Measure	Model 1 Individually No Controls		Model 2 Grouped No Controls		Model 3 Dept. Controls[a] added to Model 2		Model 4 Instit. Controls[b] added to Model 3	
Personal Advising Climate								
Advisor Support - Personal	n/a		n/a		n/a		n/a	
Advisor Support - Program	n/a		n/a		n/a		n/a	
Advisor Support - Professional Devel.	n/a		n/a		n/a		n/a	
Advisor - Labor Expectations	-0.668	***	-0.511	***	-0.334	***	-0.349	***
Faculty Support - Inclusive	0.318	***	0.082		0.064		0.069	
Faculty Support - Unbiased	0.023		-0.117		-0.084		-0.099	
Faculty Support - Directive	0.125	**	-0.010		-0.032		-0.017	
Faculty Support - Collaboration	-0.190	***	0.434	***	0.148	*	0.132	
Peer Support - Student Community	0.146	***	0.135	*	0.088		0.077	
Program Advising Climate								
Advisor Support - Personal	n/a		n/a		n/a		n/a	
Advisor Support - Program	n/a		n/a		n/a		n/a	
Advisor Support - Professional Devel.	n/a		n/a		n/a		n/a	
Advisor - Labor Expectations	-0.536	***	-0.085		0.179		0.211	
Faculty Support - Inclusive	0.436	***	0.068		0.053		0.044	
Faculty Support - Unbiased	0.162	***	-0.023		-0.020		0.009	
Faculty Support - Directive	0.297	***	0.155		0.171		0.140	
Faculty Support - Collaboration	-0.030		0.048		-0.023		-0.025	
Peer Support - Student Community	0.138	**	-0.301	***	-0.304	**	-0.285	**
Professional Dev. Advising Climate								
Advisor Support - Personal	n/a		n/a		n/a		n/a	
Advisor Support - Program	n/a		n/a		n/a		n/a	
Advisor Support - Professional Devel.	n/a		n/a		n/a		n/a	
Advisor - Labor Expectations	0.638	***	0.415	***	-0.013		-0.007	
Faculty Support - Inclusive	0.408	***	0.239	***	0.156	*	0.157	*
Faculty Support - Unbiased	0.292	***	-0.007		-0.105		-0.105	
Faculty Support - Directive	0.576	***	0.392	***	0.294	***	0.293	***
Faculty Support - Collaboration	1.063	***	0.109		-0.051		-0.026	
Peer Support - Student Community	0.411	***	0.195	**	0.255	**	0.248	**
High Advisor Workload Climate								
Advisor Support - Personal	-0.293	***	-0.374	***	-0.270	***	-0.272	***
Advisor Support - Program	-0.142	***	-0.163	***	-0.021		-0.004	
Advisor Support - Professional Devel.	0.180	***	0.085		-0.043		-0.032	
Advisor - Labor Expectations	n/a		n/a		n/a		n/a	
Faculty Support - Inclusive	-0.088	***	0.017		0.011		0.009	
Faculty Support - Unbiased	0.035		0.055		-0.079		-0.095	
Faculty Support - Directive	0.147	***	0.005		0.047		0.061	
Faculty Support - Collaboration	0.887	***	0.685	***	0.043		0.043	
Peer Support - Student Community	0.054	*	0.022		0.042		0.030	

[Table 3.8 continued on next page]

Table 3.8 (continued) - Summary of Coefficients from OLS Regressions of Social Support Measures on Departmental Climates and Selected Institutional and Departmental Controls

Departmental Measure Outcome Measure	Model 1 Individually No Controls		Model 2 Grouped No Controls		Model 3 Dept. Controls[a] added to Model 2		Model 4 Instit. Controls[b] added to Model 3	
Caring & Inclusive Faculty Climate								
Advisor Support - Personal	0.446	***	0.512	***	0.436	***	0.436	***
Advisor Support - Program	0.398	***	0.364	***	0.339	**	0.319	**
Advisor Support - Professional Devel.	0.406	***	0.330	***	0.353	**	0.351	**
Advisor - Labor Expectations	-0.304	***	-0.029		0.092		0.092	
Faculty Support - Inclusive	n/a		n/a		n/a		n/a	
Faculty Support - Unbiased	n/a		n/a		n/a		n/a	
Faculty Support - Directive	n/a		n/a		n/a		n/a	
Faculty Support - Collaboration	0.291	***	-0.258	*	0.425	***	0.401	***
Peer Support - Student Community	0.506	***	0.323	***	0.323	**	0.330	**
Unbiased Faculty Climate								
Advisor Support - Personal	0.015		-0.343	***	-0.308	**	-0.310	**
Advisor Support - Program	0.113	*	-0.219	**	-0.228	**	-0.203	*
Advisor Support - Professional Devel.	0.224	***	-0.154	*	-0.230	**	-0.222	**
Advisor - Labor Expectations	0.079		0.091		-0.141		-0.155	
Faculty Support - Inclusive	n/a		n/a		n/a		n/a	
Faculty Support - Unbiased	n/a		n/a		n/a		n/a	
Faculty Support - Directive	0.396	***	0.256	***	0.230		0.240	
Faculty Support - Collaboration	0.568	***	0.553	***	-0.033		-0.025	
Peer Support - Student Community	0.313	***	-0.191	**	-0.112		-0.122	
Careful Faculty Supervising Climate								
Advisor Support - Personal	0.137	*	0.081		0.100		0.094	
Advisor Support - Program	0.228	***	0.164	*	0.186	**	0.171	*
Advisor Support - Professional Devel.	0.520	***	0.284	***	0.231	**	0.223	**
Advisor - Labor Expectations	0.482	***	0.026		0.045		0.042	
Faculty Support - Inclusive	n/a		n/a		n/a		n/a	
Faculty Support - Unbiased	0.457	***	0.237	***	0.202		0.204	
Faculty Support - Directive	n/a		n/a		n/a		n/a	
Faculty Support - Collaboration	0.945	***	0.164	*	0.173	**	0.169	**
Peer Support - Student Community	0.307	***	-0.046		0.069		0.069	
Collaborative Faculty Climate								
Advisor Support - Personal	-0.058	*	0.178	***	0.092		0.086	
Advisor Support - Program	-0.007		0.100	**	0.023		0.027	
Advisor Support - Professional Devel.	0.189	***	0.084	*	0.026		0.040	
Advisor - Labor Expectations	0.543	***	0.319	***	0.044		0.044	
Faculty Support - Inclusive	0.052	**	0.036		0.171		0.169	
Faculty Support - Unbiased	0.133	***	0.128	***	0.051		0.053	
Faculty Support - Directive	0.185	***	0.040		0.195	***	0.193	***
Faculty Support - Collaboration	n/a		n/a		n/a		n/a	
Peer Support - Student Community	0.112	***	0.023		0.015		0.023	

[Table 3.8 continued on next page]

Table 3.8 (continued) - Summary of Coefficients from OLS Regressions of Social Support Measures on Departmental Climates and Selected Institutional and Departmental Controls

Departmental Measure Outcome Measure	Model 1 Individually No Controls		Model 2 Grouped No Controls		Model 3 Dept. Controls[a] added to Model 2		Model 4 Instit. Controls[b] added to Model 3	
Students Not Exploited Climate								
Advisor Support - Personal	0.151	***	-0.112		-0.029		-0.017	
Advisor Support - Program	0.110	***	-0.077		-0.021		-0.018	
Advisor Support - Professional Devel.	-0.052		-0.106		-0.100		-0.103	
Advisor - Labor Expectations	-0.599	***	-0.349	***	-0.252	***	-0.244	***
Faculty Support - Inclusive	0.351	***	0.305	***	0.288		0.286	
Faculty Support - Unbiased	0.356	***	0.372	***	0.335	***	0.332	***
Faculty Support - Directive	0.050		0.018		0.019		0.017	
Faculty Support - Collaboration	-0.439	***	-0.212	***	-0.081		-0.056	
Peer Support - Student Community	0.149	***	0.027		-0.022		-0.026	
Supportive Student Climate								
Advisor Support - Personal	0.163	**	0.046	***	0.055		0.049	
Advisor Support - Program	0.093	*	-0.109		-0.071		-0.063	
Advisor Support - Professional Devel.	0.294	***	0.051		0.052		0.051	
Advisor - Labor Expectations	0.137	*	0.033		0.055		0.041	
Faculty Support - Inclusive	0.391	***	0.085		0.114		0.115	
Faculty Support - Unbiased	0.312	***	-0.065		-0.006		-0.010	
Faculty Support - Directive	0.251	***	0.011		0.088		0.092	
Faculty Support - Collaboration	0.477	***	0.070		0.018		0.024	
Peer Support - Student Community	n/a		n/a		n/a		n/a	
Do Not Compete for Faculty Time Climate								
Advisor Support - Personal	0.051		0.010	***	0.039		0.063	
Advisor Support - Program	0.117	***	0.080		0.071		0.096	
Advisor Support - Professional Devel.	0.241	***	0.069		0.033		0.053	
Advisor - Labor Expectations	0.161	***	0.044		-0.008		-0.025	
Faculty Support - Inclusive	0.335	***	0.100	**	0.064		0.061	
Faculty Support - Unbiased	0.412	***	0.180	***	0.087		0.082	
Faculty Support - Directive	0.252	***	0.019		-0.013		-0.005	
Faculty Support - Collaboration	0.468	***	0.141	**	-0.043		-0.050	
Peer Support - Student Community	0.409	***	0.322	***	0.406		0.403	
Faculty Care About Research Climate								
Advisor Support - Personal	-0.400	***	-0.286	***	-0.247	**	-0.239	**
Advisor Support - Program	-0.176	***	-0.124	*	-0.011		-0.007	
Advisor Support - Professional Devel.	0.095		-0.024		-0.051		-0.062	
Advisor - Labor Expectations	0.489	***	-0.018		0.046		0.033	
Faculty Support - Inclusive	0.029		-0.060		0.055		0.058	
Faculty Support - Unbiased	0.179	***	-0.062		0.053		0.045	
Faculty Support - Directive	0.105	*	-0.028		0.042		0.047	
Faculty Support - Collaboration	0.667	***	0.267	***	0.112		0.142	*
Peer Support - Student Community	0.212	***	0.094		-0.022		-0.033	

[Table 3.8 continued on next page]

Table 3.8 (continued) - Summary of Coefficients from OLS Regressions of Social Support Measures on Departmental Climates and Selected Institutional and Departmental Controls

Departmental Measure Outcome Measure	Model 1 Individually No Controls		Model 2 Grouped No Controls		Model 3 Dept. Controls[a] added to Model 2		Model 4 Instit. Controls[b] added to Model 3	
Student Governance Climate								
Advisor Support - Personal	0.211	***	0.034		0.048		0.052	
Advisor Support - Program	0.159	***	0.027		0.027		0.018	
Advisor Support - Professional Devel.	0.113	**	-0.008		0.021		0.015	
Advisor - Labor Expectations	-0.160	***	-0.054		0.019		0.035	
Faculty Support - Inclusive	0.284	***	0.119	***	0.117	***	0.116	***
Faculty Support - Unbiased	0.201	***	0.064		0.090	**	0.097	**
Faculty Support - Directive	0.137	***	0.034		0.030		0.023	
Faculty Support - Collaboration	0.169	***	0.181	***	0.026		0.030	
Peer Support - Student Community	0.193	***	0.082	*	0.068		0.070	
Coursework Perceived as Useful Climate								
Advisor Support - Personal	-0.623	***	-0.305	**	-0.351	**	-0.325	**
Advisor Support - Program	-0.570	***	-0.455	***	-0.482	***	-0.465	***
Advisor Support - Professional Devel.	-0.118		-0.309	***	-0.427	***	-0.417	***
Advisor - Labor Expectations	1.155	***	0.192		0.002		0.014	
Faculty Support - Inclusive	-0.399	***	-0.004		-0.008		-0.013	
Faculty Support - Unbiased	-0.235	***	-0.202	**	-0.302	***	-0.291	***
Faculty Support - Directive	0.137	*	0.311	***	0.340	***	0.331	***
Faculty Support - Collaboration	1.159	***	0.610	***	-0.006		0.008	
Peer Support - Student Community	-0.200	**	-0.092		-0.037		-0.034	

* p = .05, **p = .01, ***p = .001 (two tailed)
[a] Departmental Controls include organizational characteristics and discipline
[b] Institutional Controls include governance, research expenditures, and future faculty development programs
 n/a - variable not included because of colinearity

Appendix 3A.1 - OLS Regression Coefficients for Advisor Personal Support on Components of Institutional and Departmental Contexts

Measure	Model 1 Bivariate No Controls	Model 2 Institutional Grouped	Model 3 Dept. Char. Grouped	Model 4 Disciplines Grouped	Model 5 Climates Grouped	Model 6 Department Context	Model 7 Inst. Context added to 6
Institutional Characteristics							
Private School	-0.152 ***	-0.134 ***					-0.002
R&D Expenditures	-0.004 ***	-0.003 **					-0.001
Future Faculty (National)	0.095 ***	0.054					0.033
Future Faculty (Local)	0.108 *	0.078					0.112
Departmental Characteristics							
Percentile Rank	-0.004 ***		-0.002 **			-0.002 *	-0.002
Total grad students	-0.001 **		0.001 *			0.001	0.001
Student/Teacher Ratio	-0.048 ***		-0.037 ***			-0.027 *	-0.021
% Female students	0.005 ***		0.001			-0.000	0.000
% Minorities	0.011 ***		0.007 *			0.004	0.003
% Non US Citizens	-0.003 **		-0.001			0.000	0.001
% Research Assist	-0.005 ***		-0.000			0.002	0.002
% Teaching Assist	0.002 ***		0.002			0.000	0.001
Median Years to PhD	0.046 ***		0.019 *			-0.003	-0.004
Discipline							
English	0.157 ***			0.342 ***		0.305 *	0.305 *
Philosophy	-0.033			0.179 *		0.182	0.202
Art History	-0.143 *			0.075		0.178	0.175
History	0.078 *			0.274 ***		0.268 *	0.277 *
Sociology	0.180 ***			0.368 ***		0.383 ***	0.382 ***
Psychology	0.047			0.250 ***		0.362 **	0.346 **
Chemistry	-0.261 ***			-0.002		0.228 *	0.201 *
Math	0.007			0.216 *		0.181	0.168
Geology	-0.220 ***			--		--	--
Climates							
Personal Advising	n/a				n/a	n/a	n/a
Program Advising	n/a				n/a	n/a	n/a
Prof. Dev. Advising	n/a				n/a	n/a	n/a
Overworked by Advisor	-0.293 ***				-0.374 ***	-0.270 ***	-0.272 ***
Inclusive Faculty	0.446 ***				0.512 ***	0.436 ***	0.436 ***
Unbiased Faculty Climate	0.015				-0.343 ***	-0.308 **	-0.310 **
Faculty Directiveness	0.137 *				0.081	0.100	0.094
Faculty Collaboration	-0.058 *				0.178 ***	0.092	0.086
Students Not Exploited	0.151 ***				-0.112	-0.029	-0.017
Student Community	0.163 **				0.046 ***	0.055	0.049
Do Not Compete for Faculty Time	0.051				0.010 ***	0.039	0.063
Faculty Research	-0.400 ***				-0.286 ***	-0.247 **	-0.239 **
Student Governance	0.211 ***				0.034	0.048	0.052
Coursework Useful	-0.623 ***				-0.305 **	-0.351 **	-0.325 **
Intercept		2.888	2.689	2.578	1.683	1.968	1.916
R2		0.014	0.034	0.031	0.063	0.076	0.077

* p = .05, **p = .01, ***p = .001 (two tailed)

n/a - variable not included because of colinearity

Appendix 3A.2 - OLS Regression Coefficients for Advisor Program Support on Components of Institutional and Departmental Contexts

Measure	Model 1 Bivariate No Controls	Model 2 Institutional Grouped	Model 3 Dept. Char. Grouped	Model 4 Disciplines Grouped	Model 5 Climates Grouped	Model 6 Department Context	Model 7 Inst. Context added to 6
Institutional Characteristics							
Private School	-0.147 ***	-0.159 ***					-0.087 *
R&D Expenditures	-0.003 ***	-0.004 ***					-0.001
Future Faculty (National)	0.049 *	-0.020					-0.017
Future Faculty (Local)	0.052	-0.026					0.025
Departmental Characteristics							
Percentile Rank	-0.003 ***		-0.002 *			-0.002 *	-0.001
Total grad students	-0.000 *		0.000 *			0.001 *	0.000
Student/Teacher Ratio	-0.035 ***		-0.026 **			-0.023 *	-0.010
% Female students	0.002 **		0.001			0.002	0.002
% Minorities	0.005 *		0.003			-0.001	-0.002
% Non US Citizens	0.001		0.002			0.002	0.002
% Research Assist	-0.003 ***		-0.000			0.000	-0.000
% Teaching Assist	0.002 ***		0.002 *			0.000	-0.000
Median Years to PhD	0.028 ***		0.017 *			0.007	-0.001
Discipline							
English	0.076 *			0.217 ***		0.176	0.232
Philosophy	0.039			0.190 *		0.210	0.245 *
Art History	-0.157 **			0.004		-0.021	0.005
History	0.026			0.174 **		0.134	0.187
Sociology	0.101 **			0.242 ***		0.255 **	0.281 **
Psychology	0.036			0.184		0.185	0.169
Chemistry	-0.154 ***			0.027		0.164 *	0.140
Math	0.124 **			0.269 ***		0.257 **	0.268 **
Geology	-0.160 **			--		--	--
Climates							
Personal Advising	n/a				n/a	n/a	n/a
Program Advising	n/a				n/a	n/a	n/a
Prof. Dev. Advising	n/a				n/a	n/a	n/a
Overworked by Advisor	-0.142 ***				-0.163 ***	-0.021	-0.004
Inclusive Faculty	0.398 ***				0.364 ***	0.339 **	0.319 **
Unbiased Faculty	0.113 *				-0.219 **	-0.228 **	-0.203 *
Faculty Directiveness	0.228 ***				0.164 *	0.186 **	0.171 *
Faculty Collaboration	-0.007				0.100 **	0.023	0.027
Students Not Exploited	0.110 ***				-0.077	-0.021	-0.018
Student Community	0.093 *				-0.109	-0.071	-0.063
Do Not Compete for Faculty Time	0.117 ***				0.080	0.071	0.096
Faculty Research	-0.176 ***				-0.124 *	-0.011	-0.007
Student Governance	0.159 ***				0.027	0.027	0.018
Coursework Useful	-0.570 ***				-0.455 ***	-0.482 ***	-0.465 ***
Intercept		3.172	2.850	2.852	2.550	1.895	2.091
R2		0.160	0.024	0.019	0.047	0.064	0.066

* p = .05, **p = .01, ***p = .001 (two tailed)

n/a - variable not included because of colinearity

Appendix 3A.3 - OLS Regression Coefficients for Advisor Professional Development Support on Components of Institutional and Departmental Contexts

Measure	Model 1 Bivariate No Controls	Model 2 Institutional Grouped	Model 3 Dept. Char. Grouped	Model 4 Disciplines Grouped	Model 5 Climates Grouped	Model 6 Department Context	Model 7 Inst. Context added to 6
Institutional Characteristics							
Private School	-0.050	-0.042					-0.029
R&D Expenditures	-0.000	-0.000					0.000
Future Faculty (National)	0.008	0.003					-0.027
Future Faculty (Local)	0.073	0.058					0.040
Departmental Characteristics							
Percentile Rank	-0.000		-0.001			0.001	0.000
Total grad students	-0.000		0.000			0.000	-0.000
Student/Teacher Ratio	0.003		-0.023 *			-0.008	-0.001
% Female students	-0.001		0.000			0.000	0.001
% Minorities	-0.000		-0.000			-0.001	-0.003
% Non US Citizens	0.001		-0.000			0.001	0.001
% Research Assist	0.002 ***		0.002 *			0.000	0.000
% Teaching Assist	-0.002 ***		-0.002 **			-0.000	-0.000
Median Years to PhD	-0.013 *		-0.009			0.001	-0.003
Discipline							
English	-0.202 ***			-0.337 ***		-0.257 *	-0.206
Philosophy	-0.253 ***			-0.408 ***		-0.314 **	-0.279 *
Art History	-0.063			-0.226 **		-0.100	-0.077
History	0.026			-0.146 *		-0.096	-0.047
Sociology	-0.037			-0.199 **		-0.117	-0.089
Psychology	0.155 ***			-0.032		0.035	0.041
Chemistry	0.122 ***			-0.067		0.075	0.064
Math	-0.042			-0.206 **		-0.123	-0.110
Geology	0.174 **			--		--	--
Climates							
Personal Advising	n/a				n/a	n/a	n/a
Program Advising	n/a				n/a	n/a	n/a
Prof. Dev. Advising	n/a				n/a	n/a	n/a
Overworked by Advisor	0.180 ***				0.085	-0.043	-0.032
Inclusive Faculty	0.406 ***				0.330 ***	0.353 **	0.351 **
Unbiased Faculty	0.224 ***				-0.154 *	-0.230 **	-0.222 **
Faculty Directiveness	0.520 ***				0.284 ***	0.231 **	0.223 **
Faculty Collaboration	0.189 ***				0.084 *	0.026	0.040
Students Not Exploited	-0.052				-0.106	-0.100	-0.103
Student Community	0.294 ***				0.051	0.052	0.051
Do Not Compete for Faculty Time	0.241 ***				0.069	0.033	0.053
Faculty Research	0.095				-0.024	-0.051	-0.062
Student Governance	0.113 **				-0.008	0.021	0.015
Coursework Useful	-0.118				-0.309 ***	-0.427 ***	-0.417 ***
Intercept		2.645	2.853	2.783	0.699	1.097	1.199
R2		0.002	0.013	0.030	0.055	0.064	0.065

* p = .05, **p = .01, ***p = .001 (two tailed)

n/a - variable not included because of colinearity

Appendix 3A.4 - OLS Regression Coefficients for Advisor Labor Expectations on Components of Institutional and Departmental Contexts

Measure	Model 1 Bivariate No Controls	Model 2 Institutional Grouped	Model 3 Dept. Char. Grouped	Model 4 Disciplines Grouped	Model 5 Climates Grouped	Model 6 Department Context	Model 7 Inst. Context added to 6
Institutional Characteristics							
Private School	0.024	0.053					0.083
R&D Expenditures	-0.000	0.001					-0.003 *
Future Faculty (National)	0.021	0.060					0.002
Future Faculty (Local)	0.066	0.118 *					0.017
Departmental Characteristics							
Percentile Rank	0.003 ***		-0.004 ***			0.000	0.001
Total grad students	0.001 ***		0.000			0.000	0.001
Student/Teacher Ratio	0.072 ***		-0.022 *			-0.026 *	-0.041 **
% Female students	-0.007 ***		0.002 *			-0.000	-0.000
% Minorities	-0.008 **		0.002			-0.001	0.000
% Non US Citizens	0.007 ***		-0.000			0.000	-0.001
% Research Assist	0.013 ***		0.011 ***			0.002	0.003
% Teaching Assist	-0.007 ***		-0.002 *			0.001	0.001
Median Years to PhD	-0.099 ***		-0.062 ***			0.004	0.013
Discipline							
English	-0.464 ***			-0.690 ***		-0.450 ***	-0.496 ***
Philosophy	-0.325 ***			-0.608 ***		-0.368 **	-0.370 **
Art History	-0.242 ***			-0.528 ***		-0.235	-0.222
History	-0.326 ***			-0.564 ***		-0.283 *	-0.321 *
Sociology	-0.101 *			-0.389 ***		-0.260 *	-0.276 *
Psychology	0.259 ***			-0.076		0.061	0.058
Chemistry	0.762 ***			0.320 ***		0.345 ***	0.342 ***
Math	-0.162 **			-0.452 ***		-0.234 *	-0.219
Geology	0.314 ***			--		--	--
Climates							
Personal Advising	-0.668 ***				-0.511 ***	-0.334 ***	-0.349 ***
Program Advising	-0.536 ***				-0.085	0.179	0.211
Prof. Dev. Advising	0.638 ***				0.415 ***	-0.013	-0.007
Overworked by Advisor	n/a				n/a	n/a	n/a
Inclusive Faculty	-0.304 ***				-0.029	0.092	0.092
Unbiased Faculty	0.079				0.091	-0.141	-0.155
Faculty Directiveness	0.482 ***				0.026	0.045	0.042
Faculty Collaboration	0.543 ***				0.319 ***	0.044	0.044
Students Not Exploited	-0.599 ***				-0.349 ***	-0.252 ***	-0.244 ***
Student Community	0.137 *				0.033	0.055	0.041
Do Not Compete for Faculty Time	0.161 ***				0.044	-0.008	-0.025
Faculty Research	0.489 ***				-0.018	0.046	0.033
Student Governance	-0.160 ***				-0.054	0.019	0.035
Coursework Useful	1.155 ***				0.192	0.002	0.014
Intercept		1.672	2.400	2.053	0.975	0.540	0.386
R2		0.002	0.171	0.215	0.211	0.236	0.239

* p = .05, **p = .01, ***p = .001 (two tailed)

n/a - variable not included because of colinearity

Appendix 3A.5 - OLS Regression Coefficients for Faculty Inclusive Support on Components of Institutional and Departmental Contexts

Measure	Model 1 Bivariate No Controls		Model 2 Institutional Grouped		Model 3 Dept. Char. Grouped		Model 4 Disciplines Grouped		Model 5 Climates Grouped		Model 6 Department Context		Model 7 Inst. Context added to 6	
Institutional Characteristics														
Private School	-0.042	*	-0.061	**									-0.012	
R&D Expenditures	-0.002	**	-0.003	**									-0.001	
Future Faculty (National)	0.018		-0.029										-0.008	
Future Faculty (Local)	-0.025		-0.069										-0.028	
Departmental Characteristics														
Percentile Rank	-0.001	**			-0.001						-0.001		-0.001	
Total grad students	-0.000	***			0.000						0.000		0.000	
Student/Teacher Ratio	-0.032	***			-0.041	***					-0.015		-0.016	
% Female students	0.000				-0.001						0.002		0.002	
% Minorities	0.000				-0.007	***					-0.001		-0.001	
% Non US Citizens	-0.001				-0.001						0.000		-0.000	
% Research Assist	-0.001	***			-0.000						0.001		0.001	
% Teaching Assist	0.000				-0.001						0.001		0.001	
Median Years to PhD	0.013	**			0.007						0.020	**	0.020	*
Discipline														
English	-0.037						-0.136	**			-0.019		-0.024	
Philosophy	-0.076						-0.177	**			-0.016		-0.020	
Art History	0.016						-0.090				-0.034		-0.032	
History	0.105	***					-0.019				0.083		0.077	
Sociology	-0.145	***					-0.233	***			-0.190	*	-0.192	*
Psychology	0.064	*					-0.050				-0.089		-0.093	
Chemistry	-0.085	***					-0.175	***			-0.052		-0.048	
Math	0.145	***					0.031				-0.029		-0.022	
Geology	0.110	*					--				--		--	
Climates														
Personal Advising	0.318	***							0.082		0.064		0.069	
Program Advising	0.436	***							0.068		0.053		0.044	
Prof. Dev. Advising	0.408	***							0.239	***	0.156	*	0.157	*
Overworked by Advisor	-0.088	***							0.017		0.011		0.009	
Inclusive Faculty	n/a								n/a		n/a		n/a	
Unbiased Faculty	n/a								n/a		n/a		n/a	
Faculty Directiveness	n/a								n/a		n/a		n/a	
Faculty Collaboration	0.052	**							0.036		0.171		0.169	
Students Not Exploited	0.351	***							0.305	***	0.288		0.286	
Student Community	0.391	***							0.085		0.114		0.115	
Do Not Compete for Faculty Time	0.335	***							0.100	**	0.064		0.061	
Faculty Research	0.029								-0.060		0.055		0.058	
Student Governance	0.284	***							0.119	***	0.117	***	0.116	***
Coursework Useful	-0.399	***							-0.004		-0.008		-0.013	
Intercept			2.758		2.869		2.752		2.082		1.306		1.337	
R2			0.005		0.019		0.024		0.117		0.135		0.135	

* p = .05, **p = .01, ***p = .001 (two tailed)

n/a - variable not included because of colinearity

Appendix 3A.6 - OLS Regression Coefficients for Faculty Unbiased Support on Components of Institutional and Departmental Contexts

Measure	Model 1 Bivariate No Controls		Model 2 Institutional Grouped	Model 3 Dept. Char. Grouped		Model 4 Disciplines Grouped		Model 5 Climates Grouped		Model 6 Department Context		Model 7 Inst. Context added to 6	
Institutional Characteristics													
Private School	0.015		0.004									0.050	
R&D Expenditures	0.000		0.000									0.000	
Future Faculty (National)	-0.007		-0.022									0.010	
Future Faculty (Local)	-0.020		-0.034									0.030	
Departmental Characteristics													
Percentile Rank	0.000			-0.001						-0.001		-0.001	
Total grad students	0.000			0.000						0.001	***	0.001	***
Student/Teacher Ratio	-0.018	***		-0.043	***					-0.042	***	-0.048	***
% Female students	-0.003	***		-0.002	**					0.003	*	0.003	
% Minorities	-0.010	***		-0.010	***					-0.006	**	-0.006	**
% Non US Citizens	0.003	***		0.002						0.001		0.001	
% Research Assist	0.001	*		-0.001						0.002		0.003	*
% Teaching Assist	-0.001			-0.003	***					0.000		0.001	
Median Years to PhD	-0.017	***		-0.017	*					0.014		0.018	
Discipline													
English	-0.184	***				-0.273	***			-0.253	*	-0.276	*
Philosophy	0.006					-0.113				-0.082		-0.091	
Art History	-0.034					-0.151	*			-0.213		-0.218	
History	0.037					-0.089				-0.073		-0.090	
Sociology	-0.210	***				-0.303	***			-0.187	*	-0.199	*
Psychology	0.108	***				-0.025				0.052		0.057	
Chemistry	0.060	*				-0.070				0.141	*	0.143	*
Math	0.291	***				0.155	*			0.037		0.026	
Geology	0.124	*				--				--		--	
Climates													
Personal Advising	0.023							-0.117		-0.084		-0.099	
Program Advising	0.162	***						-0.023		-0.020		0.009	
Prof. Dev. Advising	0.292	***						-0.007		-0.105		-0.105	
Overworked by Advisor	0.035							0.055		-0.079		-0.095	
Inclusive Faculty	n/a							n/a		n/a		n/a	
Unbiased Faculty	n/a							n/a		n/a		n/a	
Faculty Directiveness	0.457	***						0.237	***	0.202		0.204	
Faculty Collaboration	0.133	***						0.128	***	0.051		0.053	
Students Not Exploited	0.356	***						0.372	***	0.335	***	0.332	***
Student Community	0.312	***						-0.065		-0.006		-0.010	
Do Not Compete for Faculty Time	0.412	***						0.180	***	0.087		0.082	
Faculty Research	0.179	***						-0.062		0.053		0.045	
Student Governance	0.201	***						0.064		0.090	**	0.097	**
Coursework Useful	-0.235	***						-0.202	**	-0.302	***	-0.291	***
Intercept			2.394	1.870		2.318		1.168		1.405		1.497	
R2			0.001	0.029		0.045		0.115		0.133		0.134	

* p = .05, **p = .01, ***p = .001 (two tailed)

n/a - variable not included because of colinearity

Appendix 3A.7 - OLS Regression Coefficients for Faculty Directive Support on Components of Institutional and Departmental Contexts

Measure	Model 1 Bivariate No Controls		Model 2 Institutional Grouped		Model 3 Dept. Char. Grouped		Model 4 Disciplines Grouped		Model 5 Climates Grouped		Model 6 Department Context		Model 7 Inst. Context added to 6	
Institutional Characteristics														
Private School	-0.077	***	-0.085	***									-0.053	
R&D Expenditures	-0.002	**	-0.003	**									-0.000	
Future Faculty (National)	0.032		-0.011										-0.014	
Future Faculty (Local)	0.024		-0.020										-0.023	
Departmental Characteristics														
Percentile Rank	-0.002	**			-0.003	***					-0.001		-0.001	
Total grad students	-0.000				0.000						-0.000		-0.001	
Student/Teacher Ratio	0.004				-0.008						0.033	**	0.039	***
% Female students	-0.001	*			-0.001						-0.001		-0.001	
% Minorities	-0.001				-0.001						0.002		0.002	
% Non US Citizens	0.002	*			0.002						0.002		0.002	
% Research Assist	0.002	***			0.001						-0.002		-0.002	
% Teaching Assist	-0.002	***			-0.002	**					0.001		0.000	
Median Years to PhD	-0.004				-0.004						0.023	*	0.019	
Discipline														
English	-0.212	***					-0.262	***			-0.000		0.029	
Philosophy	-0.176	***					-0.251	***			-0.037		-0.023	
Art History	-0.016						-0.099				0.044		0.054	
History	0.033						-0.057				0.089		0.111	
Sociology	-0.085	*					-0.158	**			-0.109		-0.092	
Psychology	0.162	***					0.056				-0.034		-0.039	
Chemistry	0.094	***					-0.007				-0.073		-0.077	
Math	0.089						-0.000				-0.080		-0.067	
Geology	0.088						--				--		--	
Climates														
Personal Advising	0.125	**							-0.010		-0.032		-0.017	
Program Advising	0.297	***							0.155		0.171		0.140	
Prof. Dev. Advising	0.576	***							0.392	***	0.294	***	0.293	***
Overworked by Advisor	0.147	***							0.005		0.047		0.061	
Inclusive Faculty	n/a								n/a		n/a		n/a	
Unbiased Faculty	0.396	***							0.256	***	0.230		0.240	
Faculty Directiveness	n/a								n/a		n/a		n/a	
Faculty Collaboration	0.185	***							0.040		0.195	***	0.193	***
Students Not Exploited	0.050								0.018		0.019		0.017	
Student Community	0.251	***							0.011		0.088		0.092	
Do Not Compete for Faculty Time	0.252	***							0.019		-0.013		-0.005	
Faculty Research	0.105	*							-0.028		0.042		0.047	
Student Governance	0.137	***							0.034		0.030		0.023	
Coursework Useful	0.137	*							0.311	***	0.340	***	0.331	***
Intercept			2.376		2.581		2.354		0.957		0.016		0.152	
R2			0.006		0.013		0.032		0.067		0.083		0.084	

* p = .05, **p = .01, ***p = .001 (two tailed)

n/a - variable not included because of colinearity

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Appendix 3A.8 - OLS Regression Coefficients for Faculty Collaboration Support on Components of Institutional and Departmental Contexts

Measure	Model 1 Bivariate No Controls		Model 2 Institutional Grouped		Model 3 Dept. Char. Grouped		Model 4 Disciplines Grouped		Model 5 Climates Grouped		Model 6 Department Context		Model 7 Inst. Context added to 6	
Institutional Characteristics														
Private School	-0.099	***	-0.042										-0.016	
R&D Expenditures	0.000		0.003	*									-0.000	
Future Faculty (National)	0.109	***	0.157	***									0.080	*
Future Faculty (Local)	0.085		0.160	**									0.003	
Departmental Characteristics														
Percentile Rank	0.003	***			-0.004	***					-0.000		0.001	
Total grad students	0.000				0.000						0.000		0.000	
Student/Teacher Ratio	0.037	***			-0.077	***					-0.027	**	-0.024	*
% Female students	-0.007	***			0.006	***					-0.001		-0.001	
% Minorities	-0.002				0.007	**					-0.006	*	-0.004	
% Non US Citizens	0.011	***			0.003	*					-0.000		-0.000	
% Research Assist	0.015	***			0.014	***					0.004	**	0.003	**
% Teaching Assist	-0.007	***			-0.002	**					0.000		0.000	
Median Years to PhD	-0.119	***			-0.083	***					-0.006		-0.005	
Discipline														
English	-0.600	***					-0.952	***			-0.663	***	-0.685	***
Philosophy	-0.440	***					-0.866	***			-0.550	***	-0.558	***
Art History	-0.617	***					-1.032	***			-0.679	***	-0.691	***
History	-0.633	***					-0.965	***			-0.721	***	-0.748	***
Sociology	0.218	***					-0.258	***			-0.001		-0.032	
Psychology	0.619	***					0.086				0.248	**	0.206	*
Chemistry	0.678	***					0.104				0.173	*	0.149	*
Math	0.199	***					-0.262	***			-0.114		-0.140	
Geology	0.469	***					--				--		--	
Climates														
Personal Advising	-0.190	***							0.434	***	0.148	*	0.132	
Program Advising	-0.030								0.048		-0.023		-0.025	
Prof. Dev. Advising	1.063	***							0.109		-0.051		-0.026	
Overworked by Advisor	0.887	***							0.685	***	0.043		0.043	
Inclusive Faculty	0.291	***							-0.258	*	0.425	***	0.401	***
Unbiased Faculty	0.568	***							0.553	***	-0.033		-0.025	
Faculty Directiveness	0.945	***							0.164	*	0.173	**	0.169	**
Faculty Collaboration	n/a								n/a		n/a		n/a	
Students Not Exploited	-0.439	***							-0.212	***	-0.081		-0.056	
Student Community	0.477	***							0.070		0.018		0.024	
Do Not Compete for Faculty Time	0.468	***							0.141	**	-0.043		-0.050	
Faculty Research	0.667	***							0.267	***	0.112		0.142	*
Student Governance	0.169	***							0.181	***	0.026		0.030	
Coursework Useful	1.159	***							0.610	***	-0.006		0.008	
Intercept			2.132		3.060		2.735		-1.516		-0.003		-0.126	
R2			0.012		0.297		0.431		0.344		0.461		0.464	

* p = .05, **p = .01, ***p = .001 (two tailed)

n/a - variable not included because of colinearity

Appendix 3A.9 - OLS Regression Coefficients for Peer Community Support on Components of Institutional and Departmental Contexts

Measure	Model 1 Bivariate No Controls	Model 2 Institutional Grouped	Model 3 Dept. Char. Grouped	Model 4 Disciplines Grouped	Model 5 Climates Grouped	Model 6 Department Context	Model 7 Inst. Context added to 6
Institutional Characteristics							
Private School	0.082 ***	0.084 ***					0.034
R&D Expenditures	0.000	0.000					-0.000
Future Faculty (National)	-0.025	0.000					-0.010
Future Faculty (Local)	-0.022	0.010					0.023
Departmental Characteristics							
Percentile Rank	0.002 **		0.002 **			0.001	0.001
Total grad students	-0.000 *		-0.000 *			0.001 *	0.001 *
Student/Teacher Ratio	-0.017 **		-0.036 **			-0.027 *	-0.031 *
% Female students	-0.001		-0.001			-0.001	-0.001
% Minorities	-0.002		-0.002			0.004	0.003
% Non US Citizens	0.000		-0.002			-0.003 *	-0.003 `*`
% Research Assist	0.001 **		0.001 **			0.001	0.002
% Teaching Assist	-0.001 *		-0.001 *			-0.001	-0.001
Median Years to PhD	-0.018 ***		-0.014 ***			-0.023 *	-0.021 `*`
Discipline							
English	-0.107 ***			-0.229 ***		0.295 *	0.287 *
Philosophy	-0.062			-0.198 **		0.281 *	0.280 *
Art History	0.005			-0.134		0.342 **	0.344 **
History	-0.001			-0.140 *		0.141	0.140
Sociology	0.009			-0.131 *		0.305 ***	0.304 **
Psychology	0.028			-0.115		-0.010	0.002
Chemistry	0.030			-0.115		0.029	0.035
Math	0.047			-0.095		0.144	0.144
Geology	0.146 **			--		--	--
Climates							
Personal Advising	0.146 ***				0.135 *	0.088	0.077
Program Advising	0.138 **				-0.301 ***	-0.304 **	-0.285 **
Prof. Dev. Advising	0.411 ***				0.195 **	0.255 **	0.248 **
Overworked by Advisor	0.054 *				0.022	0.042	0.030
Inclusive Faculty	0.506 ***				0.323 ***	0.323 **	0.330 **
Unbiased Faculty	0.313 ***				-0.191 **	-0.112	-0.122
Faculty Directiveness	0.307 ***				-0.046	0.069	0.069
Faculty Collaboration	0.112 ***				0.023	0.015	0.023
Students Not Exploited	0.149 ***				0.027	-0.022	-0.026
Student Community	n/a				n/a	n/a	n/a
Do Not Compete for Faculty Time	0.409 ***				0.322 ***	0.406	0.403
Faculty Research	0.212 ***				0.094	-0.022	-0.033
Student Governance	0.193 ***				0.082 *	0.068	0.070
Coursework Useful	-0.200 **				-0.092	-0.037	-0.034
Intercept		2.848	3.136	3.040	1.966	2.397	2.336
R2		0.004	0.018	0.007	0.072	0.089	0.089

* p = .05, **p = .01, ***p = .001 (two tailed)   `*` Not Significant when curvilinear relationship included

n/a - variable not included because of colinearity

Appendix 3B.1 - Percentage Variance by Level of Analysis and the Intra-class Correlation Coefficients (ICC) for Social Support Outcomes

Support Outcome	Level of Variance			ICC
	Student	**Department**	**Institution**	
Advisor - Personal	93.53	4.83 ***	1.64 ***	0.065
Advisor - Program	95.27	3.35 ***	1.38 ***	0.047
Advisor - Professional Devel.	95.28	4.54 ***	0.18	0.047
Advisor - Labor Expectations	77.23	22.76 ***	0.00	0.228
Faculty - Inclusive	87.13	11.94 ***	0.93 *	0.129
Faculty - Unbiased	85.12	14.68 ***	0.20	0.149
Faculty - Directive	90.89	8.25 ***	0.86	0.091
Faculty - Collaboration	51.61	48.37 ***	0.02	0.484
Peer - Student Community	87.61	11.64 ***	0.75	0.124

*p = .05, **p = .01, ***p = .001 (two tailed)

Chapter 4: Social Support as Variables of Influence

The previous chapter focused on explaining how the concepts of social support can be applied to and operationalized in graduate education and how components of the organizational context of graduate school can influence graduate students' perceptions of social support and therefore accumulation of capital. This chapter examines why social support is useful and important for studying graduate student socialization.

Rather than targeting issues related to graduate student socialization, much of the attention and research on graduate education in recent years has involved the study of student attrition, persistence, and time to degree, which places the focus on whether or not students complete their degree and the amount of time it takes to do so. Within that body of research, social capital (often referred to as social integration) is viewed as crucial but is usually only operationalized as quantitative measures of how often students interact with faculty. I argue that if students do remain in school, it is also important to understand how students' experiences help to shape their knowledge, skills, and identities as academic professionals, and that social support is a key component for understanding the qualitative aspects of faculty interaction in this socialization process.

Faculty and peers are considered fundamental agents of socialization in graduate education, therefore, the social interactions and relationships that students have with these agents are a vital part of the professional socialization process. Professional socialization is the manner by which people, who want to identify and act as part of a profession, acquire the knowledge, values, norms, attitudes, and skills of that profession. Social support identifies how well the interactions with advisors, faculty, and peers assist students in acquiring knowledge, values, and skills. So, as the accumulation of capital,

social support should have a direct impact on graduate students' professional socialization.

This dissertation looks at socialization outcomes from a multidimensional perspective that considers both the acquisition of professional culture (skills, norms, values, etc) and the identity of oneself as a professional. Since the acquisition of professional culture is measured as self-assessments of professional cultural, the acquisition of professional culture and a professional identity are simply referred to as professional self-concepts. Thus, the main research question that guides the analysis for this chapter is:

What are the effects of social support on students' professional self-concepts? Because social support is an indicator of the accumulation of capital, differences in social support translate into differences in accumulated capital, which means that differences in support should have an impact on the self-concept outcomes of the socialization process.

This chapter explores two particular dimensions of the professional self-concept as theorized by Becker and Carper (1956): 1) the tasks professionals choose to perform in their occupations, and 2) the particular types of institutions in which professionals wish to establish their careers.[1] Graduate students often develop a sense of how much and what types of research, teaching and service they would like to do as future faculty members, as well as the type of institution where they would perform these tasks. Because, as indicated in the previous chapter, social support involves the acquisition of informational and instrumental aid as well as emotional assistance, it is expected that social support will have an effect on the perception that students 1) have acquired enough knowledge and

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[1] This dissertation also uses a third dimension, commitment to an occupational title and ideology; however, because the sample in this chapter is based on students who are interested in a faculty career in the future, there is no variability with regard to this dimension.

skill (preparation), and 2) have the ability to use their knowledge and skill (confidence) to

perform tasks related to their future roles as faculty members. Also, because there are

different types of social support based on the different relationships that student have

with advisors, faculty and peers, it is likely that some forms of social support should be

more influential on the preparation and confidence for some professional tasks than for

others. Likewise, social support should have an effect on the preferences and

expectations students have for the type of institution in which they will perform these

tasks. However, the strength and direction of this influence should not only vary with the

type of support being considered, but should also vary with the type of institution they

prefer or expect. Career institution preferences and expectations are important because

they can influence the type of faculty positions that graduate students will apply for and

attain. If, as found in the previous chapter, structural factors lead to inequality in social

support, and inequality in social support leads to the unequal accumulation of capital,

then structural differences in graduate institutions can bias the socialization and eventual

placement of academic professionals.

Methods

Sample

This set of analyses uses a sub-sample of the base sample used in the previous

chapter. Student data are from the Survey on Doctoral Education (SDE), utilizing

respondents from 190 graduate departments at 26 institutions from around the country.

Students are in their third-year or higher and represent the Humanities (English,

Philosophy, Art History), Social Sciences (History, Sociology, Psychology), and Physical

Sciences (Chemistry, Mathematics, Geology). Student level data were matched to

departmental data based on the National Survey of Graduate Faculty from the National

Research Council and aggregated climate measures of student level data. Student and

departmental data were then matched to institutional level data from the National Center

for Educational Statistics (NCES).

For the analyses in this chapter a filter was necessary to create a sub-sample of the

base sample of 3,023 graduate students. Based on the format of the questioning in the

SDE, students only answered questions about institutional preferences and expectations,

and preparation for and confidence in the ability to perform various faculty-related tasks

if they answered "yes" or "maybe" to the question "Are you considering a faculty job at

any point in the future?" Thus, students who answered "no" to this question had to be

excluded from the analyses containing these variables, bringing the number of graduate

students for this sub-sample to 2,568.[2]

Measures of Faculty Tasks and Occupational Institutions

The four measures that are used as outcomes of future faculty tasks are scales that

were developed using items from the SDE. Scales were created using factor and internal

reliability analysis, which resulted in measures of *preparation* and *confidence* for

undergraduate & local level tasks and graduate & professional level tasks.

Undergraduate & Local (Undergraduate level) refers to teaching and advising

undergraduate students and service conducted within a department, campus, or local

community. *Graduate & Professional* (Graduate level) refers to teaching and advising

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[2] Descriptions and comparison of the base sample and the sub-sample, as well as a description of the
dependent variables and control variables can be found in the methods chapter (Chapter 2) and the methods
section of Chapter 3.

graduate students, conducting research, and providing service to the professional

community through activities such as reviewing journal submissions.

The two outcomes related to the institutions at which students will establish their

careers were also developed using items from the SDE. Each measure determines

whether students have *preferences* or *expectations* to work at *Bachelor's level*

institutions, *Doctoral level institutions*, or no preferences or expectations at all.

Multinomial regression results in this chapter focus on the comparison of bachelor's level

versus doctoral level preferences and expectations.

Control Variables

Several types of individual and organizational controls are included in the

following analyses to determine the strength and significance of the effect of social

support when these potentially confounding factors are held constant. *Organizational*

controls include the institutional and departmental factors considered in the previous

chapter: institutional characteristics, departmental characteristics, discipline, and

departmental climates. *Individual demographics* are included to control for gender, race,

citizenship, age, relationship and parental status, number of years in the department, and

the stage of program completion. Measures of *social capital* control for whether or not a

student has a second advisor/mentor, the number of other people involved with their

dissertation related research (as in lab situations), and whether or not students have

supportive student communities outside of their department. *Involvement* measures take

into account the fact that some students may have been involved in teaching, research,

service, and internship activities that could also contribute to task preparation and

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confidence. Similarly, *enjoyment* measures try to control for any effect that liking or disliking teaching, service, and research may have on self-assessments of preparation and confidence. Finally, when considering task confidence, task preparation is used as a control because I am trying to assess the net effects of support on confidence, and task confidence is affected by the level of task preparation a student receives. Also, both *preparation* and *confidence* are used as controls when analyzing career institutions.

Results

Overall, measures of social support have a positive impact on socialization outcomes related to professional self-concepts. Table 4.1 presents the Pearson correlation matrices for the individual variables and professional self-concept outcomes, which will be used in subsequent analysis. There are a couple of general patterns in the bivariate correlations of social support to the selected outcomes. Overall, but not exclusively, most forms of social support have a positive correlation with task preparation and confidence and career institution preferences and expectations. There are only four significant negative correlations, and three of them involve the relationship of social support with confidence to perform undergraduate related tasks.[3] Also, the strength of the correlations show that, in general, social support is most strongly connected to task preparation followed by task confidence and then career institution outcomes. Although none of the correlation coefficients can be considered extremely large, approximately three quarters of the relationships between social support measures and the selected outcomes are statistically significant. Therefore, there does appear to be

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[3] Institutional preference and expectation are categorical variables, therefore, a negative correlation shows a preference or expectation for categories coded with lower numbers rather than an actual negative effect of support.

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an effect of social support on aspects of graduate students' professional self-concepts, and overall this effect is positive, but it varies in strength based on the component of the professional self-concept being influenced.

OLS Regressions of Task Preparation & Confidence on Social Support

Social support can have an effect on the preparation and confidence to perform professional tasks; however, the effect of support on task preparation is larger than the effect on confidence, and a large proportion of many effects can be attributed to the relationship of preparation and confidence with other individual and organizational factors. Table 4.2 presents coefficients from OLS regression models that pertain to the effect of social support on the four outcomes related to the preparation and confidence to conduct tasks as future faculty members. Models 2 through 8 include coefficients for support measures after the inclusion of controls, which can have a potentially confounding effect on the original bivariate relationship. Appendices 4A.1 through 4A.4 present all coefficients, including controls, for each model as they pertain to each of the four faculty task outcome measures. Social support can have an effect on task preparation and confidence, but once other factors have been held constant, the effect of support are fewer, smaller, and focused mainly on task preparation.

Model 1 in Table 4.2 corroborates the results from the Pearson correlations that most forms of social support significantly affect task preparation and confidence and that the effect is usually positive; however, Model 1 also shows that some of the effects of social support are curvilinear in nature. The effect of advisor program support on undergraduate task preparation starts off as negative when program support is perceived

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as very low, and yet becomes positive when support is perceived more strongly (1.56 and

on a 1.00-4.00 scale). Similarly, when faculty are perceived as more biased in their

provision of support, there is negative effect on undergraduate task confidence that

changes to become positive when faculty are more strongly perceived as unbiased (point

of inflection = 2.84). On the other hand, the effect of faculty collaboration on

undergraduate preparation starts off as positive when little collaboration is perceived, and

becomes negative as collaboration increases (point of inflection = 2.40). Therefore,

support is not necessarily always a positive resource, because support that can be

beneficial for some aspects of professional development (graduate task preparation and

confidence) can actually have a detrimental effect on other dimensions of a professional

self-concept (undergraduate task preparation and confidence). Also, because the effects

of support on task preparation are stronger than the effects on task confidence, social

support can be viewed as more useful for providing students with professional knowledge

and skills, than for giving students the confidence to effectively utilize this knowledge

and skill.

In Model 2, when all forms of social support are included together as a group

there is a substantial drop in the size and significance of most coefficients, indicating that

much of the effect of any one type of support on task preparation and confidence is due in

large part to the effect of other types of support. In fact across all outcomes in Model 2,

the median change in the effect of all forms of support together is a decrease of 62%,

leaving only half of the effects of support on preparation and confidence statistically

significant, and of those significant effects two thirds of them are on preparation.

Furthermore, examination of the R^2 statistics in Model 2 of Appendices 4A.1 through

4A.4 also show the sizable proportion of variance in task preparation attributable to social

support collectively (10.6% undergraduate and 22.4% graduate), whereas the proportion

of variance in task confidence that can be explained by social support is much smaller

(4.1% undergraduate and 6.6% graduate). These results show that there is a sizable effect

of social support on task preparation and confidence, but that the interrelated effects of all

forms of support make it less likely that any one form of support will have a unique and

independent effect on task preparation and confidence.

Other factors have a much smaller influence on the effect of social support on task

preparation. The overall median effect of support on undergraduate and graduate task

preparation is quite substantial when other forms of support were included (decreased by

56% and 76% respectively); however, the addition of controls typically resulted in little

to no change (average median decrease of less than 7%). Although a small proportion of

the effect of social support on task preparation is due to other factors, the majority of the

effect of any one type of social support on task preparation is due to an independent

effect of that type of social support in combination with the effect of other forms of

support. Even after including all controls, half of all the types of social support have an

independent significant effect on task preparation. This result validates the importance of

social support for the acquisition of the capital necessary to prepare graduate students for

their careers as faculty, but also indicates that it can be difficult to isolate the relative

importance of some particular types of support.

Other variables have a much larger impact on the effects of social support on task

confidence. Changes in the overall effects of social support on task confidence across

models indicate that much of the effect of any one type of social support on

undergraduate and graduate task confidence is also due to the effect of other forms of

support (median decreases of 26% and 82% respectively); however, a large proportion of

these effects are also due to the effect of various control variables on task confidence.

Task preparation, in particular, makes up a very large proportion of the effect of social

support on task confidence, especially with regard to graduate task confidence (median

decreases of -29% undergraduate and -92% graduate). This is understandable from the

perspective that students' confidence will be more directly based on the skills that they

acquired through social interactions, than on the perception that certain relationships

helped them to acquire these skills. Ultimately, less than twenty percent of all types of

support have a unique and significant effect on undergradute and graduate task

confidence, making the direct effects of social support less useful in understanding the

effects of social interaction on task confidence as compared to task preparation.

Also, whereas the influence of control variables on the effect of social support on

task preparation is more uniform, there is more variability in the impact of controls on the

effect of social support on task confidence. In particular, enjoyment of tasks accounts for

a sizable portion of the effect of social support on the undergraduate task confidence

(median decrease of 32%), but the effect of most types of support on graduate task

confidence increase in Model 6 when enjoyment controls are added. This indicates that

the effect of social support on graduate task confidence has very little to do with personal

enjoyment of those tasks. Similarly, Model 5 demonstrates that involvement in

professional activities has much less to do with the relationship of social support to

undergraduate task confidence (median increase of 12%), than it does for graduate task

confidence (median decrease of 15%). Thus, not only is the effect of social support on

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task confidence is not as strong as the effect of support on task preparation, but it also is different. The effect of social support on confidence can be viewed as more indirect, through the effect of preparation on confidence, and may serve a different function in its effect on confidence than it does on preparation. For example, the effect of social support on preparation is related to the accumulation of resources through supportive interactions with advisors, faculty, and staff, whereas the effect of support on confidence may have more to do with social comparisons. One explanation may be that some students think that they receive support because they are perceived by others as needing it, and are thus less capable than others.

Examining the effect of specific forms of social support on task preparation and confidence, once all controls have been held constant, not only are some types of support not always significant for every task outcome, but also the effect of one type of support can vary across outcomes. For example, faculty collaboration increases student perceptions that they are prepared to conduct future faculty tasks related to the graduate level, but decreases perceptions of preparation and confidence for undergraduate related tasks. Furthermore, although collaboration has a negative effect on both the preparation and confidence to conduct undergraduate level tasks, the effect on confidence is linear, whereas the effect on preparation is curvilinear. Collaboration support has a positive effect on undergraduate preparation when students perceive it as mostly missing, but the effect turns negative when higher levels of faculty collaboration is detected (point of inflection 2.50 on a 1.00-4.00 scale). Support is typically considered as something positive, but these results indicate that not only does it not always have a positive effect

when support levels are higher, but also support can have more of a positive effect when it is perceived as lacking.

Except for perceptions that faculty do not exploit students and students do not compete with each other for faculty time and attention, all other types of social support have a significant effect on at least one outcome of task preparation or confidence after controlling for other factors, and there is a pattern to these effects. Peer support and all four types of advisor support have significant effects almost exclusively on graduate task preparation, and the effect is typically positive. Faculty support, on the other hand, can influence both task preparation and confidence, but the effects on preparation are mostly positive, whereas the effects on confidence are predominantly negative. Consequently, faculty support can have a broader impact on the task related dimension of students' professional self-concept, but the effect may not be a positive one.

Advisor support does have an initial effect on all forms of task preparation and confidence, but once all other factors have been held constant, advisor support significantly affects mainly the preparation for graduate faculty tasks. All three forms of advisor support that are based on relationships providing some sort of assistance (personal, program, and professional development) start with significant effects that increase beliefs of being prepared and confident, but other forms of support account for a significant portion of these effects. In Model 2, the effects of personal support on graduate task preparation and confidence remain significant but become negative, meaning that personal support decreases perceptions of graduate task preparation and confidence. Due mainly to the effects of enjoyment and preparation, in the end, after all controls have been included, advisor personal support decreases perceptions of being

prepared to conduct graduate level tasks, advisor program support increases preparation

of both graduate and undergraduate level tasks[4], and professional development support

increases perceptions of being prepared to conduct graduate level faculty tasks. Advisor

labor expectations, which are based on relational demands rather than the provision of

assistance, also significantly increase perceptions of preparedness for graduate level tasks

but only once these expectations are beyond being viewed as extremely low (point of

inflection = 1.56). Therefore, the social support that graduate students think they receive

from advisors does have a significant impact on perceptions of themselves as being

prepared to conduct faculty tasks at the undergraduate and graduate levels. Yet, advisor

social support does not appear to have as much of a unique and direct impact on the

confidence students think that they have to perform these tasks when controlling for other

factors.

Similarly, peer community support has a lasting significant impact on task

preparation. Initially peer support increases all types of task preparation and confidence,

but, with the inclusion of other forms of support, the effect on graduate preparation

becomes curvilinear where low levels of community strongly decrease perceptions of

preparation, but higher levels of peer support increases them (point of inflection = 2.56).

Involvement in professional activities greatly accounts for personal assessments of

support with regard to undergraduate task preparation and confidence, and in the end only

the curvilinear effect of peer community support on graduate level preparation remains

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[4] The effect of advisor program support on undergraduate faculty task preparation is initially curvilinear
with students perceiving that they are significantly less prepared when support is seen as extremely low, but
begin to increase perceptions of being prepared when low (point of inflection 1.56). However, in Model 8,
although the curvilinear relationship is listed as insignificant, supplemental analysis shows that a linear
relationship significantly increases undergraduate task preparation (.068**) and leaves the remaining
support coefficients essentially unchanged.

significant. Apparently, peers can help students to acquire the knowledge and skills they need to be able to accomplish graduate tasks, but are unable to assist them with being confident that they are able to do so.

The three remaining types of faculty support (inclusive, unbiased, and directive) each have a different pattern in their effects on task preparation and confidence. When faculty help students to see themselves as more included in the department, it has a direct and significant effect of helping students to perceive themselves as more prepared to conduct undergraduate and graduate tasks, and after controlling for preparation, this inclusiveness significantly decreases the confidence to conduct at least undergraduate level tasks. It is possible that students worry that by becoming more included in the department, which is a doctoral level department, they may become more focused on graduate level tasks and lose their ability to conduct undergraduate ones. On the other hand, after introducing all controls, unbiased faculty support, which is based on the perceptions of equal distribution of support, actually decreases confidence in the ability to conduct graduate tasks. Conversely, confidence in the ability to conduct undergraduate faculty tasks decreases if faculty are perceived as biased, but undergraduate task confidence increases when faculty are seen as unbiased (point of inflection 3.01 on a 1-4 scale). Finally, directive faculty support does significantly increase perceptions of undergraduate and graduate task preparation even after other forms of support are introduced. So, faculty support can have a direct and significant effect on task confidence as well as preparation, but the effect is not always positive.

So, social support does have an overall positive effect on the preparation and confidence to perform professional tasks, but the significance and direction of these

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effects can vary depending on the source of the support. The effect of support on task preparation is stronger than the effect on confidence, and other factors can account for a large portion of these effects, especially with regard to task confidence. The social support coming from advisors and peers mostly impacts graduate task preparation, and can be curvilinear as well as linear. Faculty support is much broader in its effects on both preparation and confidence, but the effects on confidence are more negative than positive. Therefore, interactions with advisors, faculty, and peers do provide a means for students to increase their sense of preparation as members of the academic profession, but the positive effects of social support are concentrated on the preparation for graduate tasks.

Multinomial Regressions of Career Institution Preferences & Expectations on Support

Social support does influence the likelihood that students will prefer or expect to work at some types of institutions rather than others; however, advisor support has very little impact on institutional preference and expectations, and a large proportion of the effects of social support can be attributed to other factors. Table 4.3 presents coefficients from multinomial logistic regression models that pertain to the effect of social support on the preference and expectation to begin faculty careers at bachelor's colleges rather than doctoral level universities. Models 2 through 8 include coefficients of social support after the inclusion of controls, which can have a potentially confounding effect on the original bivariate relationship. Appendices 4B.1 & 4B.2 present all coefficients, including controls, for each model as they pertain to the preference and expectation for particular institutions to establish faculty careers. Social support can have an effect on career institution preference and expectation, but once other factors have been held

constant, the effects of social support are fewer, smaller, and mainly the result of faculty support.

Model 1 of Table 4.3 illustrates that more than half of the various forms of social support each have an initial significant bivariate effect on the preferences and expectations of bachelor's level institutions as compared to doctoral ones, and that these effects are more likely to decrease preferences and expectations. Therefore, it is possible to say that there is a connection between the perceptions of social support and the likelihood that students prefer to and expect to be employed at some types of institutions rather than others.

Although there is an initial influence of social support on career institution preference and expectation, much of these effects are due to the effect of other variables. As we have seen in other tables, when all forms of support are included at the same time in Model 2, the overall effects of support decrease substantially and usually more than when any other controls are added. In this case, the effect of other types of social support account for a more substantial part of the overall effect on the preference of liberal arts colleges over doctoral universities as compared to the overall effect on expectations, which is more moderate (median decrease of 57% and 15% respectively). Model 3 illustrates that individual demographic information has much more to do with the effect of social support on preferences than it does on expectations (median decrease of 22% and 3% respectively). Although social capital has almost no overall impact on the effect of social support on preferences or expectations, involvement in professional activities, on the other hand, has two different influences on the effect of social support. Although in most cases controlling for involvement decreases the effect of support on the

expectation to work at a bachelor's level institution, it typically increases the effects of support on the preference for working at these institutions. The opposite is true for the inclusion of organizational factors. When factors such as discipline and departmental climate are held constant, support has a smaller impact on the preference for working at liberal arts institutions, but a bigger impact on expectations. In the end, only half of the original bivariate effects remain significant, so we can say that social support can have an impact on the preference or expectation to work at some types of institutions rather than others, but that a large part of this effect is due to the effect of other individual and organizational factors.

However, the effects of social support on career institution preference and expectation can be considered limited, because after all controls are held constant, only one third of all possible effects are significant and more than half of the different types of social support have no effect. Advisor personal support, advisor labor expectations, and no student competition for faculty attention each have no significant effect on institutional preferences and expectations either initially or after the inclusion of all controls. The effect of advisor program support on the expectation to work at a bachelor's rather than a doctoral institution reduces almost completely when other forms of support are included, and the effect on institutional preference decreases below significance after controlling for task enjoyment. A similar pattern holds for faculty inclusiveness, except that the effect on institutional preference looses its significance with the addition of controls for involvement. The effect of faculty supervision on both institutional preference and expectation looses its significance with the introduction of other support variables in Model 2. Therefore, this leaves advisor professional

development, peer community, and faculty collaboration, and the lack of faculty bias and exploitation as the only forms of social support that have a significant independent effect on the preference and expectation to work at liberal arts institutions rather than doctoral institutions, all else being equal.

Higher perceptions of advisor professional development support do decrease the preference and expectation of working at bachelor's level institutions, and although these effects increase with the inclusion of other forms of social support and measures of social capital, a big part of these effects is reduced when task enjoyment, preparation, and confidence are also controlled. However, the negative effect of advisor professional development support on institutional preference and expectation increases with the inclusion of organizational context variables, although only the negative effect on the expectation of working at a liberal arts institution returns to significance. Interactions with advisors that increase professional development appear to emphasize the development of skills and careers related to graduate level work rather than the undergraduate level.

A type of social support that significantly increases the expectation of working at a liberal arts level institution is the perceived lack of faculty bias. Although the initial effects on preference and expectation are both negative, inclusion of other social support variables reduces these effects so much that the effect on institutional preference becomes insignificant and the effect on expectations becomes positive. Inclusion of individual characteristics, involvement, and organizational variables all increase this positive effect of unbiased faculty (63%, 6%, and 30% respectively), making the final positive effect of faculty bias quite large and significant. Students can perceive faculty as biased with

regard to whom they provide support, or the type of support that they provide. Perceiving faculty as less biased can indicate that through their interactions students perceive faculty as being more open to different points of view, making them more available as a source of support for careers other than what students perceive as the expected norm of graduate level work.

Faculty collaboration also changes the direction of it effect, but solely as the result of the inclusion of organizational factors. Initially the effect of collaboration on the preference and expectation on working at a liberal arts college is negative, but, after the inclusion of other support and individual demographic variables, the negative effect on both outcomes decreases below significance. The inclusion of organizational factors such as disciplines and departmental climates caused such a large decrease in the effect of collaboration (867%) that, in Model 8 when the effect of other factors are held constant, the effect of faculty collaboration significantly increases the preference of working at a bachelor's level institution. There is a great deal of interdisciplinary collaboration that takes place in smaller institutions. So, this effect of collaboration support on the preference for bachelor's level rather than doctoral level institutions may only be visible because the effect of specific disciplines is being held constant.

If students perceive that they are not being exploited by faculty they are significantly less likely to want to and expect to work at 4-year liberal arts type institutions than at doctoral level institutions, and after controlling for other variables these effects are even stronger. Only the addition of organizational factors has any influence to decrease these effects, and the decreases are negligible (less than -4%). Students who dislike exploitation may look at exploitation as a negative part of graduate

level departments, and therefore choose to pursue careers in institutions that do not possess this negative attribute.

Students who perceive higher levels of peer community support are also significantly more likely to aspire to and expect to work at bachelor's level institutions rather than doctoral institutions. The effects of peer community support on both institutional preference and expectation are stronger than the initial positive effects. However, the increases in effect size are mainly due to the inclusion of other forms of social support (94% - 189%) as well as factors related to the organizational context (13% - 26%). Students who perceive higher levels of community support may receive more support from their peer to pursue bachelor's level institutions.

Therefore, after controlling for individual and organizational factors, only one type of social support from advisors has an effect on the institutional preference or expectation in where graduate students will establish their careers. Students who perceive higher levels of professional development support are more likely to expect to work at doctoral institutions instead of at bachelor's level ones. Conversely, faculty and peer support appears to have more of an effect on both the preference and expectation to work at a particular type of institution.

Secondary Analysis – Multilevel Modeling

Because of the nested nature of the data, the use of OLS and standard multinomial logistic regression methods necessitated the disaggregation of organizational level data down to the individual level. As stated in the previous chapter, this can result in biased standard errors and potential misinterpretations of significance. Therefore I conducted

secondary analysis using multilevel modeling techniques as a test of the robustness of the

patterns and results that were reported above. Overall, the coefficients and standard

errors that were produced are nearly identical, and thus the basic patterns in relative

effect size and direction of influence remained the same.

The only slight exception is in self-assessments of being prepared to conduct

undergraduate faculty tasks. Table 4.5 shows the comparison of coefficients and standard

errors from OLS and multilevel regressions of task preparation and confidence on social

support. In the original OLS analysis the curvilinear effect of advisor program support

ceases to be significant, and although the difference in coefficients is extremely small, the

curvilinear nature of the effect remains significant in the multilevel analysis. Overall,

both analytical techniques produced extremely similar results, and thus no other

reinterpretations of the effects of social support on the components of graduate students'

professional self-concepts are needed.

Conclusions

Analyses in this chapter indicate that the measures of social support that students

perceive from their advisors, faculty, and peers do have an effect on certain components

of their professional self-concept. Not only can measures of social support be applied to

the graduate school setting, but these measures can also be useful in understanding

particular aspects of social interaction and integration in affecting the outcomes of

professional socialization. Also, very importantly, these analyses support similar

findings from clinical settings that illustrate that although the concept of "support"

typically has positive connotations, not every form of social support is beneficial for all

outcomes (Heller et al. 1990), and, in this case, any one type of social support may be beneficial for some professional outcomes and detrimental for others.

The very nature of the reciprocal roles between students and faculty is intended to foster the socialization process, so social support becomes a measure of the effectiveness of these relationships and this process. As was seen in the previous chapter, social support can be an indication that relationships are providing instrumental, informational, and/or emotional assistance. Because relationships and interactions with advisors, faculty, and peers are seen as fostering the learning of professional values, attitudes, skills, and knowledge, social support can enhance the socialization process, increase the integration of students into the department and the profession, and develop professional roles and identities. The more these supportive relationships and interactions provide what students perceive is necessary for proper socialization, the more supportive these relationships will appear, and the more these interactions will increase perceptions of preparation and confidence for conducting professional tasks in the future. Therefore, the reason social support has such a significant independent effect on professional task preparation is because social support is a determination of how effectively departmental relationships provide the necessary components for graduate student socialization, and one of the functions of graduate student socialization is to properly prepare students to operate within the profession.

It is important, however, to recognize that not all types of social support are equally effective or beneficial to the various goals of socialization or to the various components of the professional self. For example, faculty inclusiveness and faculty directiveness are beneficial for both graduate and undergraduate task preparation, and

faculty collaboration helps students to perceive themselves as more prepared for graduate level tasks; however, faculty collaboration actually has a detrimental effect on undergraduate task preparation. Also, interactions with advisors, faculty, and peers are much more effective at helping students to see themselves as prepared for graduate faculty tasks rather than those related to the undergraduate level. Social support increases perceptions of preparation because that is what these supportive relationships were designed to do. Therefore, it is possible that some of these departmental relationships (and thus support) are intended to foster socialization to graduate level skills more than undergraduate level ones. Historically, doctoral programs in the United States grew from the German tradition that placed the pursuit of knowledge through research as paramount over all other faculty endeavors (Rudolph 1990). The professional academic culture of modern doctoral programs, still emphasize the learning, acquisition, and evaluation of research skills, much more than pedagogical ones. Therefore, it is not too surprising that relationships with advisors and faculty tend to reinforce the acquisition of resources related to graduate rather than undergraduate task preparation.

If students need to learn from the socializing agents within their department, but interactions with some of them hinder rather than enhance this educational process, then students may perceive less support because they perceive themselves as being denied full access to the all the possible information and training they need to be prepared and to develop as a professional. Besides the relational content that forms the basis of why students interact with others, the nature of how students interact with these agents of socialization also appears to be important. Social support based on assessments of advisor labor expectations, faculty bias, faculty exploitation, and student competition for

faculty attention are less about the reasons for interacting, and are more evaluations of the demands, prejudices, abusiveness, and levels of access that are potentially a part of the relationships with other departmental members. If students must access the resources they need to become socialized members of the profession, but certain social ties appear unavailable or provide less information than is needed, then students will perceive their preparation as lacking.

Again, however, the effect of these types of support are not absolute and, although some interactions with advisors, faculty, and peers may be more demanding, unfair, unpleasant, or limited, does not preclude these interactions from being beneficial in some way. For example, it is only once advisors make sufficient demands of their advisees that students begin to see themselves as more prepared to conduct graduate level tasks. It may be that by expecting students to take larger amounts of time to work on tasks students are likely to engage more deeply or in extended ways that increase learning more than if the demands we lower. In the case of faculty bias, students who perceive faculty as being non-discriminatory and fair in their interactions and support of students, perceive themselves as more confident to conduct undergraduate tasks, but less confident in their ability to conduct graduate tasks. Students who perceive higher faculty bias, do perceive that they have had less access to necessary information and instruction, but because they perceive faculty as a less dependable source of support, the students have found other ways to enhance their training leading to a more self-reliant and self-efficacious view of themselves as professionals.

The relationship of social support to preparation is stronger and maintains more direct significant effects when controlling for other factors than the effect of social

support on confidence. As already mentioned, social support can increase preparation because the interactions that students have with others are perceived as providing them with the necessary knowledge, skills, and values to conduct particular faculty tasks. Self-efficacy, referred to as confidence in this study, is distinctly different from preparation. Although students may have been given the skills and knowledge to carry out a task, confidence refers to the perception that they have the ability to use this knowledge and skill to actually execute the proper course of action in order to successfully complete the task (Bandura 1977, 1982). Therefore, in order to increase confidence, supportive interactions with advisors, faculty, and peers will need to be able to provide something other than what is necessary to simply increase a sense of preparation.

From a social learning perspective, judgments of self-efficacy, whether accurate or not, are based on four sources of information in decreasing order of relevance: enactive attainments; vicarious experiences of observing others; verbal persuasion and other forms of social encouragement; and, emotional or physiological self-feedback (Bandura 1977, 1982). If supportive interactions and relationships with advisors, faculty, and peers are able to provide opportunities for directly practicing tasks, observing others model these tasks, or receiving encouragement to take on these tasks, then they can increase student perceptions of task confidence. Therefore, unless supportive interactions entail direct practice of future tasks, the ability of social support to increase confidence is based on more indirect and less effective means, making it understandable that the more overall direct effects of support on preparation are generally stronger than on confidence. The effects of social support on task confidence are smaller and fewer, but social support does have a significant impact on task confidence. These relationships are important to

understand because perceiving themselves as having the ability to perform tasks related to their professional roles can be a vital part of how students define themselves as professionals, because people who are less confident in their ability to perform certain task tend to avoid them (Bandura 1977, 1982).

Students also define themselves as academic professionals by the institutions in which they hope to or expect to carry out particular tasks and to make their careers. Because socialization involves the learning of attitudes and values in addition to knowledge and skills, it is possible that interactions with advisors, faculty, and peers help to shape the value placed on particular faculty tasks and the preferences and expectations students have for which type of institution is best for carrying them out. If this is the case, there should not only be some relationship between social support and career institution preferences and expectations, but also the types of support which are associated with certain faculty tasks should have a similar relationship to preferences and expectations. For example, advisor professional development support increases perceptions of graduate task preparation. Similarly, advisor professional development support decreases the preference and expectation to work at bachelor's level institutions rather than doctoral level ones.

The conclusions that can be made based on these analyses must be understood in light of certain limitations. The effects of social support on professional socialization are based on the perception of social support. Regardless of whether or not departmental members acted or intended to act in a manner that was supportive, it is whether or not graduate students interpreted a behavior as supportive that will determine its effect on professional socialization. Also, because there are no measures of preferences and

expectations prior to entering graduate school, these results do not necessarily tell us that support causes changes in preferences or expectations for different types of career institutions, but only that students with particular perceptions of support tend to have particular preferences and expectations. Thus, it is possible that there is some relationship between support and preferences/expectations because students with certain preferences and expectations tend to interact and perceive the relationships with advisors, faculty, and peers in similar ways. It is even possible that students with certain preferences and expectation seek out certain types of relationships with faculty and peers in order to validate their preferences and increase the likelihood that these preferences achieve the expected outcomes. The same arguments can also be made because of the lack of measure of prior preparation and confidence. Several of the controls were introduced to help compensate for this fact, but they do not achieve quite the same result. Therefore, results should be interpreted with these limitations in mind.

Since social support has been shown to be a relevant concept in the study of graduate education, and functions as a useful tool for gaining more specific understanding as to how relationships with faculty and peers can affect the outcomes of the socialization process, the next chapter examines how one specific individual characteristic, gender, can affect the accumulation of social support. Chapter 5 will also explore how gender itself affects these same professional self-concept outcomes in the hopes of demonstrating the reproduction of gender bias within the system of graduate education.

Table 4.1 - Pearson Correlation Matrix of Faculty Task Preparation & Confidence and Career Institution Preferences & Expectations with Social Support & Other Selected Individual Measures

	Y1	Y2	Y3	Y4	Y5	Y6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23	X24	X25	X26	X27
Y1	1.00	0.43	0.43	0.21	-0.03	0.08	0.12	0.10	0.10	-0.05	0.04	-0.05	0.04	-0.05	-0.01	0.07	0.00	-0.01	0.06	-0.01	0.04	0.07	0.00	-0.17	0.04	0.04	-0.03
Y2		1.00	0.22	0.60	0.15	0.13	0.07	0.14	0.23	0.05	0.12	0.04	0.12	0.11	-0.01	0.04	0.04	-0.12	-0.01	-0.05	0.03	-0.00	0.01	0.02	0.03	0.03	-0.04
Y3			1.00	0.54	0.00	0.04	0.21	0.23	0.21	-0.08	0.24	0.12	0.19	0.02	0.08	0.13	0.07	0.03	0.01	0.02	-0.01	0.00	-0.01	-0.03	0.01	0.03	0.00
Y4				1.00	0.13	0.10	0.15	0.27	0.38	0.11	0.30	0.21	0.26	0.26	0.05	0.15	0.14	-0.11	-0.04	-0.01	-0.03	0.00	-0.02	0.04	0.01	0.00	-0.00
Y5					1.00	0.29	-0.03	0.03	0.07	0.04	0.03	0.03	0.03	0.08	0.03	-0.00	0.04	-0.06	0.03	-0.01	-0.03	-0.08	0.01	0.12	-0.01	-0.03	-0.01
Y6						1.00	0.05	0.08	0.12	0.01	0.07	0.01	0.05	0.07	0.02	0.01	0.06	-0.04	0.07	0.02	0.02	-0.08	-0.00	0.06	0.02	0.01	-0.02
X7							1.00	0.63	0.57	-0.28	0.37	0.17	0.21	0.06	0.16	0.13	0.13	0.04	-0.01	-0.02	-0.02	0.04	-0.01	-0.04	0.03	0.02	-0.02
X8								1.00	0.65	-0.16	0.41	0.22	0.29	0.10	0.15	0.16	0.21	-0.03	-0.01	-0.01	-0.04	-0.01	-0.03	0.03	0.02	-0.01	-0.02
X9									1.00	0.04	0.38	0.19	0.31	0.24	0.06	0.23	0.18	-0.03	-0.04	-0.03	-0.03	0.02	-0.03	0.02	0.02	-0.01	-0.01
X10										1.00	-0.16	-0.14	0.01	0.26	-0.32	-0.01	-0.06	-0.07	-0.02	0.01	-0.01	-0.02	-0.04	0.06	0.04	0.01	-0.02
X11											1.00	0.59	0.51	0.21	0.41	0.40	0.40	-0.06	-0.05	-0.02	-0.03	0.04	-0.03	0.03	-0.01	0.00	-0.02
X12												1.00	0.33	0.20	0.43	0.22	0.39	-0.08	-0.07	-0.02	-0.04	0.00	-0.05	0.10	-0.01	-0.02	-0.01
X13													1.00	0.24	0.16	0.19	0.23	-0.06	-0.02	0.02	-0.01	-0.04	-0.01	0.09	0.03	0.02	-0.02
X14														1.00	-0.05	0.13	0.17	-0.07	0.00	0.01	-0.03	-0.03	-0.01	0.07	0.04	0.04	-0.03
X15															1.00	0.17	0.27	0.02	-0.05	0.01	-0.01	0.01	0.02	0.03	-0.04	-0.02	0.00
X16																1.00	0.36	0.03	-0.05	-0.00	-0.00	0.11	-0.04	-0.10	-0.07	0.01	0.00
X17																	1.00	-0.04	-0.01	0.00	-0.00	-0.01	-0.02	0.03	-0.03	-0.00	-0.03
X18																		1.00	0.05	0.01	0.06	0.03	-0.00	-0.09	0.02	0.04	-0.03
X19																			1.00	-0.03	-0.03	-0.30	-0.03	-0.05	0.05	-0.00	0.01
X20																				1.00	-0.03	-0.28	-0.03	-0.05	-0.03	-0.01	0.02
X21																					1.00	-0.31	-0.03	-0.06	0.06	-0.00	-0.04
X22																						1.00	-0.29	-0.53	-0.08	0.04	0.03
X23																							1.00	-0.05	-0.00	-0.02	0.03
X24																								1.00	0.07	-0.01	-0.02
X25																									1.00	-0.27	-0.40
X26																										1.00	-0.36
X27																											1.00

[Table 4.1 continued on the next page]

Table 4.1 (continued) - Pearson Correlation Matrix of Faculty Task Preparation & Confidence and Career Institution Preferences & Expectations with Social Support & Other Selected Individual Measures

	X28	X29	X30	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40	X41	X42	X43	X44	X45	X46	X47	X48	X49	X50	X51	X52	X53	X54
Y1	-0.04	-0.05	0.03	0.06	0.06	0.03	0.10	-0.04	-0.03	0.04	0.02	0.13	-0.07	0.12	0.02	0.17	0.15	0.11	0.07	-0.00	0.39	0.26	-0.01	0.43	1.00	0.21	0.43
Y2	-0.02	-0.04	0.02	0.04	0.04	-0.00	0.02	-0.09	-0.06	0.05	0.08	0.08	0.06	0.05	0.06	0.03	0.03	0.16	0.18	0.05	0.02	0.04	0.40	1.00	0.43	0.60	0.22
Y3	-0.04	-0.06	0.04	0.05	0.05	0.06	0.04	-0.02	-0.03	-0.00	0.05	0.09	-0.07	0.09	0.03	0.20	0.10	0.07	0.06	0.03	0.16	0.11	0.06	0.22	0.43	0.54	1.00
Y4	-0.01	0.03	-0.02	-0.01	0.02	0.00	-0.04	-0.05	-0.04	0.01	0.09	0.03	0.17	0.03	0.06	0.05	-0.02	0.14	0.24	0.08	-0.04	0.00	0.26	0.60	0.21	1.00	0.54
Y5	0.05	0.07	-0.04	-0.05	-0.05	-0.05	-0.07	-0.01	0.02	-0.04	0.04	-0.01	0.05	-0.03	-0.01	-0.04	-0.01	0.02	0.06	0.01	-0.11	-0.08	0.15	0.15	-0.03	0.13	0.00
Y6	0.01	0.07	-0.04	-0.05	-0.03	-0.03	-0.07	-0.02	0.01	-0.02	0.05	0.04	0.04	0.03	0.01	0.00	0.01	0.04	0.10	0.01	0.01	-0.01	0.07	0.13	0.08	0.10	0.04
X7	-0.02	-0.04	0.03	0.03	0.06	0.07	0.02	0.03	-0.04	0.00	0.03	0.06	-0.08	0.04	-0.06	0.11	0.03	0.07	0.06	0.01	0.09	0.09	0.05	0.07	0.12	0.15	0.21
X8	-0.00	-0.01	0.01	-0.00	0.01	-0.00	-0.05	0.01	-0.01	-0.03	0.05	0.01	-0.02	-0.01	-0.05	0.09	-0.00	0.04	0.08	-0.03	0.05	0.03	0.13	0.14	0.10	0.27	0.23
X9	0.00	0.08	-0.02	-0.09	0.00	-0.03	-0.12	0.01	-0.05	0.01	0.04	0.03	0.15	0.06	0.03	0.09	0.00	0.14	0.22	0.02	0.05	0.03	0.16	0.23	0.10	0.38	0.20
X10	-0.04	0.13	-0.08	-0.07	-0.09	-0.06	-0.11	0.01	0.11	-0.08	-0.02	-0.04	0.39	-0.01	0.13	-0.10	-0.06	0.02	0.18	0.06	-0.06	0.00	-0.04	0.05	-0.05	0.10	-0.08
X11	0.03	0.04	-0.04	0.01	0.04	0.01	-0.09	0.01	-0.03	0.02	0.01	0.04	0.01	0.01	-0.04	0.13	-0.03	0.05	0.16	0.04	0.02	0.03	0.10	0.12	0.04	0.30	0.24
X12	0.04	0.04	-0.05	0.01	0.03	0.02	-0.11	0.02	-0.02	-0.01	0.03	-0.10	0.04	-0.05	-0.04	0.03	-0.10	-0.03	0.09	0.04	-0.02	0.01	0.06	0.04	-0.05	0.21	0.12
X13	-0.02	0.02	-0.02	0.00	-0.00	0.01	-0.05	0.02	0.02	-0.03	0.00	-0.02	0.11	0.02	0.01	0.03	-0.07	0.03	0.14	0.05	-0.01	0.01	0.06	0.12	0.04	0.26	0.19
X14	-0.05	0.15	-0.14	-0.02	-0.07	-0.03	-0.17	0.04	0.09	-0.10	0.01	-0.12	0.40	-0.06	0.08	-0.03	-0.08	0.12	0.30	0.12	-0.09	0.01	-0.05	0.10	-0.05	0.26	0.02
X15	0.05	-0.03	0.01	0.03	0.05	0.03	-0.00	-0.02	-0.05	0.06	-0.02	-0.02	-0.14	-0.03	-0.05	0.09	-0.01	-0.05	-0.03	-0.00	0.03	0.00	0.06	-0.01	-0.01	0.05	0.08
X16	0.06	0.17	-0.11	-0.09	0.00	-0.06	-0.15	0.01	0.01	-0.01	-0.01	0.07	0.09	0.10	0.01	0.17	0.13	0.12	0.15	0.02	0.07	0.05	0.01	0.04	0.07	0.15	0.13
X17	0.06	0.09	-0.06	-0.05	-0.04	-0.03	-0.12	-0.01	0.00	-0.00	0.01	-0.03	0.05	-0.04	0.00	0.04	-0.03	-0.02	0.09	0.04	-0.01	-0.00	0.02	0.04	0.00	0.13	0.07
X18	0.00	-0.02	0.01	0.04	0.05	0.00	0.03	0.08	-0.03	-0.02	-0.02	0.04	-0.08	0.07	0.02	0.04	0.09	0.10	-0.01	0.07	0.01	0.10	-0.04	-0.11	-0.01	-0.11	0.03
X19	-0.06	-0.01	0.01	0.00	-0.06	0.02	0.01	0.02	0.05	-0.05	-0.00	-0.02	-0.05	0.08	0.00	-0.03	0.03	-0.01	-0.03	0.05	-0.02	0.03	-0.05	-0.01	0.06	-0.04	0.01
X20	0.03	0.06	-0.04	-0.03	-0.03	-0.01	-0.03	0.01	-0.00	0.02	-0.03	0.01	0.01	0.05	0.04	-0.04	-0.01	-0.01	-0.03	0.00	-0.00	-0.02	-0.04	-0.05	-0.01	-0.01	0.02
X21	-0.01	-0.02	0.04	-0.03	0.01	-0.01	-0.00	0.01	-0.01	-0.00	0.00	0.03	-0.04	0.06	0.04	-0.05	0.01	0.02	-0.05	0.01	0.01	0.03	0.03	0.03	0.04	-0.03	-0.01
X22	0.05	0.03	-0.01	0.04	0.11	0.00	0.09	-0.01	0.00	0.01	0.00	0.04	0.00	-0.03	-0.04	0.13	0.06	0.05	0.09	-0.01	0.11	0.03	-0.06	-0.00	0.07	0.01	0.00
X23	-0.01	-0.01	0.01	0.00	-0.04	-0.01	-0.00	0.04	-0.05	0.01	0.00	0.04	-0.03	0.02	-0.00	0.04	0.03	-0.01	-0.03	-0.04	-0.01	0.03	-0.02	0.01	0.00	-0.02	-0.01
X24	-0.04	-0.01	0.03	-0.04	-0.04	0.01	-0.12	-0.02	-0.01	0.02	-0.01	-0.07	0.05	-0.06	-0.01	-0.11	-0.11	-0.10	-0.05	0.01	-0.17	-0.09	0.12	0.02	-0.17	0.04	-0.03
X25	-0.29	-0.13	0.04	0.17	0.02	0.07	0.04	0.03	0.02	-0.05	0.03	-0.00	0.01	-0.00	-0.02	-0.06	-0.01	0.01	-0.00	0.04	0.02	0.03	0.03	0.03	0.04	0.01	0.01
X26	-0.26	0.00	-0.02	0.04	0.03	0.01	0.00	-0.01	-0.01	0.02	-0.00	0.01	0.00	-0.01	0.01	0.03	-0.01	0.02	0.00	0.03	-0.01	0.02	-0.02	0.03	0.04	0.01	0.03
X27	-0.38	0.04	0.03	-0.10	-0.03	-0.03	0.01	-0.02	-0.03	0.06	-0.03	0.01	-0.02	-0.03	-0.00	0.01	0.01	0.00	-0.01	-0.03	-0.01	-0.03	-0.03	-0.03	-0.02	-0.00	0.00

[Table 4.1 continued on the next page]

Table 4.1 (continued) - Pearson Correlation Matrix of Faculty Task Preparation & Confidence and Career Institution Preferences & Expectations with Social Support & Other Selected Individual Measures

	X28	X29	X30	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40	X41	X42	X43	X44	X45	X46	X47	X48	X49	X50	X51	X52	X53	X54
X28	1.00	0.11	-0.04	-0.09	0.01	-0.05	-0.06	0.00	0.02	-0.03	0.01	-0.01	0.01	0.05	0.01	0.02	0.00	-0.03	0.01	-0.03	0.01	-0.01	0.02	-0.01	-0.04	-0.01	-0.04
X29		1.00	-0.78	-0.31	-0.13	-0.25	-0.41	0.05	0.10	-0.06	-0.09	-0.03	0.26	-0.01	0.11	-0.02	-0.01	-0.04	0.10	0.02	-0.01	0.01	-0.08	-0.03	-0.05	0.03	-0.06
X30			1.00	-0.31	0.10	0.12	0.26	-0.04	-0.09	0.05	0.09	0.02	-0.19	0.02	-0.07	0.05	0.03	0.06	-0.05	-0.01	-0.01	-0.03	0.04	0.02	0.03	-0.02	-0.06
X31				1.00	0.09	0.23	0.26	-0.01	-0.03	0.03	0.01	0.03	-0.12	-0.03	-0.06	-0.04	-0.02	-0.03	-0.07	-0.00	0.03	0.05	0.05	0.04	0.06	-0.01	0.05
X32					1.00	0.33	0.10	-0.03	-0.05	0.03	0.05	0.04	-0.04	-0.05	-0.04	0.01	-0.01	0.06	-0.02	0.00	0.07	0.04	0.01	0.04	0.06	0.02	0.05
X33						1.00	0.16	-0.02	-0.02	-0.01	0.05	0.02	-0.08	-0.05	-0.07	-0.01	-0.02	0.00	-0.04	0.01	0.04	0.05	-0.01	0.00	0.03	0.00	0.06
X34							1.00	-0.22	-0.21	0.18	0.19	0.01	-0.19	0.03	-0.04	0.05	0.06	0.09	-0.04	0.01	0.05	0.03	-0.03	0.02	0.10	-0.04	0.04
X35								1.00	-0.16	-0.39	-0.11	0.02	-0.03	-0.02	-0.12	0.00	0.02	-0.07	-0.01	0.04	-0.02	0.03	-0.05	-0.09	-0.04	-0.05	-0.02
X36									1.00	-0.61	-0.17	-0.03	0.03	-0.01	-0.02	0.01	0.00	-0.07	0.02	-0.01	-0.01	-0.01	-0.04	-0.05	-0.03	-0.04	-0.03
X37										1.00	-0.43	0.05	-0.01	0.02	0.07	-0.02	0.00	0.05	-0.03	-0.03	0.04	-0.02	0.03	0.05	0.04	0.01	0.00
X38											1.00	-0.05	0.01	0.01	0.03	0.00	-0.02	0.08	0.03	0.01	-0.03	0.01	0.05	0.07	0.02	0.09	0.05
X39												1.00	-0.13	0.08	-0.01	0.07	0.13	0.07	0.03	-0.03	0.06	0.06	0.05	0.07	0.13	0.03	0.09
X40													1.00	-0.03	0.18	-0.12	-0.13	0.04	0.21	0.05	-0.02	0.02	-0.05	0.06	-0.07	0.17	-0.07
X41														1.00	0.01	0.08	0.10	0.05	0.01	0.01	0.08	0.10	-0.00	0.05	0.12	0.03	0.09
X42															1.00	0.05	-0.00	0.04	0.06	-0.01	0.02	-0.00	-0.00	0.05	0.02	0.06	0.03
X43																1.00	0.19	0.08	0.28	-0.02	0.12	0.02	-0.02	0.03	0.17	0.04	0.20
X44																	1.00	0.14	0.03	0.03	0.09	0.12	0.01	0.03	0.15	-0.02	0.09
X45																		1.00	0.19	0.08	0.02	0.03	0.07	0.16	0.11	0.14	0.07
X46																			1.00	0.08	-0.01	0.02	0.05	0.18	0.07	0.24	0.06
X47																				1.00	-0.04	0.04	-0.01	0.05	0.00	0.09	0.03
X48																					1.00	0.33	-0.15	0.02	0.39	-0.04	0.16
X49																						1.00	-0.05	0.04	0.26	0.00	0.11
X50																							1.00	0.39	-0.01	0.26	0.06
X51																								1.00	0.43	0.60	0.22
X52																									1.00	0.21	0.43
X53																										1.00	0.53
X54																											1.00

[Table 4.1 continued on the next page]

Table 4.1 (continued) - Pearson Correlation Matrix of Faculty Task Preparation & Confidence and Career Institution Preferences & Expectations with Social Support & Other Selected Individual Measures

Legend:

Y1	Confidence - Undergrad & Local Tasks	X20	Asian American	X39	Have a Mentor/Second Advisor
Y2	Confidence - Research and Grad & Prof Tasks	X21	Hispanic	X40	Number of People Integrated with Diss Research
Y3	Prepared - Undergrad & Local Level Tasks	X22	White	X41	Part of Supportive Student Community Outside Dept
Y4	Prepared - Research and Grad & Prof Tasks	X23	Other Race/Ethnicity	X42	Involvement - Have Fulfilled Teaching/TA Requirement
Y5	Very Strong Institutional Preference	X24	International Student	X43	Involvement - Progressively Responsible Teaching Roles
Y6	High Institutional Expectation	X25	Parent Highest Ed - HS	X44	Involvement - Service
X7	Advisor Support - Personal	X26	Parent Highest Ed - BA	X45	Involvement - Research Presentation
X8	Advisor Support - Program	X27	Parent Highest Ed - MS	X46	Involvement - Progressively Responsible Research Roles
X9	Advisor Support - Professional Development	X28	Parent Highest Ed - Doc	X47	Involvement - Internship
X10	Advisor Support - Labor Expectations	X29	Age in the 20's	X48	Enjoyment of Teaching
X11	Faculty Support - Inclusive	X30	Age in the 30's	X49	Enjoyment of Service
X12	Faculty Support - Unbiased	X31	Age in the 40's or higher	X50	Enjoyment of Research
X13	Faculty Support - Directive	X32	Partnered	X51	Confidence - Research and Grad & Prof Tasks
X14	Faculty Support - Collaboration	X33	Have Children	X52	Confidence - Undergrad & Local Tasks
X15	Faculty Support - Students Not Exploited	X34	Year in Program	X53	Prepared - Research and Grad & Prof Tasks
X16	Peer Support - Student Community	X35	Stage in Program - Pre-quals	X54	Prepared - Undergrad & Local Tasks
X17	Peer Support - Students Do Not Compete for Faculty Attn.	X36	Stage in Program - Post-quals		
X18	Femal	X37	Stage in Program - Post-proposal		
X19	African	X38	Stage in Program - Post-defense		

Table 4.2 - Summary of Coefficients from OLS Regressions of Preparation and Confidence Measures on Social Support and Individual & Organizational Controls

Measure of Social Support Outcome Measure	Model 1 Support Bivariates No Controls	Model 2 Support Variables Grouped	Model 3 Indiv. Demog. Controls Added to 2	Model 4 Social Capital Controls Added to 3	Model 5 Involvement Controls Added to 4	Model 6 Enjoyment Controls Added to 5	Model 7 Preparation Controls Added to 6	Model 8 Organizational Controls Added to 7
Advisor - Personal								
Prepared - Undergraduate Faculty Tasks	0.137 ***	0.032	0.020	0.016	0.016	0.009	n/a	0.011
Prepared - Graduate Faculty Tasks	0.099 ***	-0.073 ***	-0.070 ***	-0.071 ***	-0.070 ***	-0.054 ***	n/a	-0.048 **
Confident - Undergraduate Faculty Tasks	0.060 ***	0.041 **	0.031 *	0.028 *	0.029 *	0.010	0.010	0.009
Confident - Graduate Faculty Tasks	0.041 ***	-0.060 ***	-0.056 ***	-0.058 ***	-0.057 ***	-0.036 *	-0.003	-0.003
Advisor - Program								
Prepared - Undergraduate Faculty Tasks	-0.216 *	-0.307 **	-0.248 *	-0.211	-0.191	-0.132	n/a	-0.135 a
Effect of Squared Term	0.069 ***	0.066 ***	0.055 **	0.050 **	0.047 *	0.036 *	n/a	0.036 a
Prepared - Graduate Faculty Tasks	0.208 ***	0.053 **	0.049 *	0.055 **	0.067 ***	0.058 **	n/a	0.077 ***
Confident - Undergraduate Faculty Tasks	0.057 ***	0.012	0.016	0.024	0.026	0.027	0.007	0.000
Confident - Graduate Faculty Tasks	0.099 ***	0.018	0.015	0.022	0.035	0.023	-0.001	0.003
Advisor - Professional Development								
Prepared - Undergraduate Faculty Tasks	0.152 ***	0.036	0.047 *	0.042 *	0.035	0.030	n/a	0.035
Prepared - Graduate Faculty Tasks	0.273 ***	0.214 ***	0.211 ***	0.204 ***	0.185 ***	0.158 ***	n/a	0.141 ***
Confident - Undergraduate Faculty Tasks	0.051 ***	0.021	0.029	0.021	0.009	0.006	-0.007	-0.002
Confident - Graduate Faculty Tasks	0.147 ***	0.154 ***	0.152 ***	0.145 ***	0.121 ***	0.075 ***	-0.010	-0.020
Advisor - Labor Expectations								
Prepared - Undergraduate Faculty Tasks	-0.055 ***	-0.024	-0.017	-0.008	-0.004	-0.004	n/a	0.007
Prepared - Graduate Faculty Tasks	0.068 ***	-0.108	-0.099	-0.100	-0.104	-0.097	n/a	-0.102
Effect of Squared Term	n/s	0.037 **	0.036 **	0.034 **	0.033 **	0.032 **	n/a	0.033 **
Confident - Undergraduate Faculty Tasks	-0.026 **	-0.012	-0.003	0.002	0.005	0.002	0.001	-0.001
Confident - Graduate Faculty Tasks	0.029 *	0.002	0.010	0.009	0.001	0.006	-0.013	-0.013

[Table 4.2 continued on the next page]

Table 4.2 (continued) - Summary of Coefficients from OLS Regressions of Preparation and Confidence Measures on Social Support and Individual & Organizational Controls

| Measure of Social Support | Model 1 Support Bivariates | | Model 2 Support Variables | | Model 3 Indiv. Demog. Controls | | Model 4 Social Capital Controls | | Model 5 Involvement Controls | | Model 6 Enjoyment Controls | | Model 7 Preparation Controls | | Model 8 Organizational Controls | |
Outcome Measure	No Controls		Grouped		Added to 2		Added to 3		Added to 4		Added to 5		Added to 6		Added to 7	
Faculty - Inclusive																
Prepared - Undergraduate Faculty Tasks	0.226	***	0.134	***	0.134	***	0.122	***	0.113	***	0.114	***	n/a		0.104	***
Prepared - Graduate Faculty Tasks	0.272	***	0.122	***	0.116	***	0.113	***	0.105	***	0.098	***	n/a		0.112	***
Confident - Undergraduate Faculty Tasks	0.027	*	0.010		0.000		-0.009		-0.017		-0.015		-0.045	**	-0.038	*
Confident - Graduate Faculty Tasks	0.098	***	0.065	**	0.050	*	0.043		0.033		0.018		-0.025		-0.019	
Faculty - Unbiased																
Prepared - Undergraduate Faculty Tasks	0.107	***	-0.010		-0.001		0.009		0.019		0.018		n/a		0.021	
Prepared - Graduate Faculty Tasks	0.177	***	0.050	*	0.045	*	0.049	*	0.050	*	0.046	*	n/a		0.037	
Confident - Undergraduate Faculty Tasks	-0.287	***	-0.294	***	-0.272	***	-0.264	***	-0.269	***	-0.198	**	-0.209	**	-0.205	**
Effect of Squared Term	0.051	***	0.047	**	0.046	**	0.046	**	0.049	***	0.034	*	0.035	**	0.034	**
Confident - Graduate Faculty Tasks	0.028		-0.035		-0.034		-0.026		-0.022		-0.025		-0.044	**	-0.039	*
Faculty - Directive																
Prepared - Undergraduate Faculty Tasks	0.153	***	0.067	***	0.066	***	0.067	***	0.070	***	0.072	***	n/a		0.052	**
Prepared - Graduate Faculty Tasks	0.205	***	0.049	**	0.051	**	0.048	**	0.046	**	0.046	**	n/a		0.038	*
Confident - Undergraduate Faculty Tasks	0.026	*	0.023		0.027	*	0.026		0.030	*	0.031	*	0.013		0.011	
Confident - Graduate Faculty Tasks	0.087	***	0.027		0.027		0.025		0.025		0.026		0.009		0.001	
Faculty - Collaboration																
Prepared - Undergraduate Faculty Tasks	0.187	*	0.215	**	0.191	**	0.194	**	0.180	*	0.195	**	n/a		0.210	**
Squared Term	-0.039	*	-0.055	***	-0.049	**	-0.045	**	-0.042	**	-0.044	**	n/a		-0.042	**
Prepared - Graduate Faculty Tasks	0.173	***	0.081	***	0.085	***	0.082	***	0.060	***	0.073	***	n/a		0.043	*
Confident - Undergraduate Faculty Tasks	-0.025	**	-0.030	**	-0.025	*	-0.013		-0.019		-0.007		-0.009		-0.031	*
Confident - Graduate Faculty Tasks	0.064	***	0.024		0.029	*	0.034	*	0.009		0.033	*	-0.008		-0.019	
Faculty - Do Not Exploit																
Prepared - Undergraduate Faculty Tasks	0.049	***	-0.014		-0.015		-0.014		-0.017		-0.020		n/a		-0.014	
Prepared - Graduate Faculty Tasks	0.032	**	-0.009		-0.009		-0.006		-0.004		-0.005		n/a		0.003	
Confident - Undergraduate Faculty Tasks	-0.005		-0.011		-0.007		-0.005		-0.006		-0.009		-0.004		-0.003	
Confident - Graduate Faculty Tasks	-0.005		-0.011		-0.009		-0.006		-0.003		-0.006		-0.007		-0.001	

[Table 4.2 continued on the next page]

Table 4.2 (continued) - Summary of Coefficients from OLS Regressions of Preparation and Confidence Measures on Social Support and Individual & Organizational Controls

Measure of Social Support Outcome Measure	Model 1 Support Bivariates No Controls		Model 2 Support Variables Grouped		Model 3 Indiv. Demog. Controls Added to 2		Model 4 Social Capital Controls Added to 3		Model 5 Involvement Controls Added to 4		Model 6 Enjoyment Controls Added to 5		Model 7 Preparation Controls Added to 6		Model 8 Organizational Controls Added to 7	
Peer - Student Community																
Prepared - Undergraduate Faculty Tasks	0.108	***	0.052	**	0.058	***	0.048	**	0.026		0.021		n/a		0.036	
Prepared - Graduate Faculty Tasks	0.120	***	-0.256	**	-0.299	**	-0.310	***	-0.303	**	-0.249	**	n/a		-0.256	**
Squared Term	n/s		0.047	**	0.057	***	0.057	***	0.055	***	0.046	**	n/a		0.050	**
Confident - Undergraduate Faculty Tasks	0.042	***	0.042	***	0.039	**	0.030	*	0.010		0.000		-0.004		0.001	
Confident - Graduate Faculty Tasks	0.030	*	-0.024		-0.010		-0.017		-0.029		-0.024		-0.025	*	-0.018	
Peer - Do Not Compete for Attention																
Prepared - Undergraduate Faculty Tasks	0.044	***	-0.024		-0.020		-0.016		-0.013		-0.012		n/a		-0.009	
Prepared - Graduate Faculty Tasks	0.082	***	-0.016		-0.016		-0.013		-0.013		-0.011		n/a		-0.008	
Confident - Undergraduate Faculty Tasks	0.002		-0.004		0.000		0.004		0.008		0.011		0.014		0.014	
Confident - Graduate Faculty Tasks	0.025	*	-0.000		0.000		0.003		0.005		0.010		0.012		0.012	

*p = .05, **p = .01, ***p = .001 (two tailed)

n/a - not applicable

[a] supplemental analysis shows that a linear relationship significantly increases undergraduate task preparation (.068**) and leaves the remaining support coefficients essentially unchanged

Table 4.3 - Summary of Coefficients from Multinomial Regressions of Preference & Expectation for Working at Bachelor's Institutions Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls[a]

Outcome Measure Measure of Social Support	Model 1 Support Bivariates No Controls	Model 2 Support Variables Grouped	Model 3 Indiv. Demog. Controls Added to 2	Model 4 Social Capital Controls Added to 3	Model 5 Involvement Controls Added to 4	Model 6 Enjoyment Controls Added to 5	Model 7 Prep. & Confid. Controls Added to 6	Model 8 Organizational Controls Added to 7
Advisor - Personal								
Preference	-0.014	0.486 ***	0.404 ***	0.417 ***	0.418 ***	0.248 *	0.213	0.181
Expectation	-0.070	0.396 *	0.289	0.290	0.277	0.111	0.067	0.084
Advisor - Program								
Preference	-0.398 ***	-0.324 **	-0.252 *	-0.244	-0.295 *	-0.249	-0.233	-0.112
Expectation	-0.342 *	-0.047	0.014	0.024	-0.018	0.064	0.101	0.086
Advisor - Professional Devel.								
Preference	-0.428 ***	-0.486 ***	-0.494 ***	-0.510 ***	-0.462 ***	-0.239	-0.136	-0.213
Expectation	-0.531 ***	-0.708 ***	-0.684 ***	-0.695 ***	-0.655 ***	-0.482 *	-0.383	-0.470 *
Advisor - Labor Expectations								
Preference	-0.042	-0.010	0.063	0.017	0.065	0.020	0.038	0.085
Expectation	-0.004	0.100	0.172	0.159	0.198	0.165	0.194	0.152
Faculty - Inclusive								
Preference	-0.410 ***	-0.316 *	-0.355 *	-0.316 *	-0.313	-0.257	-0.191	-0.322
Expectation	-0.339 *	-0.287	-0.374	-0.361	-0.358	-0.300	-0.258	-0.472
Faculty - Unbiased								
Preference	-0.315 ***	-0.071	0.061	0.033	0.056	0.058	0.045	0.031
Expectation	-0.124	0.252	0.409 *	0.406 *	0.429 *	0.403 *	0.367	0.478 *

[Table 4.3 continued on next page]

Table 4.3 (continued) **- Summary of Coefficients from Multinomial Regressions of Preference & Expectation for Working at Bachelor's Institutions Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls**[a]

Outcome Measure Measure of Social Support	Model 1 Support Bivariates No Controls	Model 2 Support Variables Grouped	Model 3 Indiv. Demog. Controls Added to 2	Model 4 Social Capital Controls Added to 3	Model 5 Involvement Controls Added to 4	Model 6 Enjoyment Controls Added to 5	Model 7 Prep. & Confid. Controls Added to 6	Model 8 Organizational Controls Added to 7
Faculty - Directive								
Preference	-0.267 ***	0.004	0.081	0.064	0.085	0.105	0.146	0.151
Expectation	-0.372 **	-0.177	-0.133	-0.137	-0.126	-0.129	-0.095	-0.183
Faculty - Collaboration								
Preference	-0.189 **	-0.082	-0.027	-0.093	-0.005	-0.083	-0.034	0.264 *
Expectation	-0.330 **	-0.297 *	-0.244	-0.257	-0.175	-0.197	-0.151	0.083
Faculty - Do Not Exploit								
Preference	-0.198 **	-0.168 *	-0.196 *	-0.195 *	-0.214 **	-0.239 **	-0.253 **	-0.245 *
Expectation	-0.225 *	-0.326 **	-0.371 **	-0.369 **	-0.394 **	-0.411 **	-0.418 **	-0.402 **
Peer - Student Community								
Preference	0.153	0.443 ***	0.321 **	0.324 **	0.299 **	0.260 *	0.241 *	0.304 *
Expectation	0.281 *	0.545 ***	0.478 **	0.472 **	0.457 **	0.393 *	0.365 *	0.412 *
Peer – Do Not Compete for Attention								
Preference	-0.105	-0.001	0.044	0.044	0.053	0.048	0.056	0.043
Expectation	0.041	0.126	0.164	0.163	0.155	0.168	0.196	0.103

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] No Strong Preference and No High Expectations are the excluded categories

Table 4.4 - Comparison of Coefficients and Standard Errors from OLS and Multilevel Regressions of Task Preparation and Confidence on Social Support Controlling for Selected Individual and Organizational Factors

Outcome Measure	OLS Support with Controls		Multilevel Support with Controls	
Measure of Social Support	Coeff.	SE	Coeff.	SE
Prepared - Undergraduate Faculty Tasks				
Advisor - Personal	0.011	0.019	0.011	0.018
Advisor - Program	-0.135	0.109	-0.155	0.110
Program Squared	0.036	0.019	0.040 *	0.019
Advisor - Professional Devel.	0.035	0.022	0.035	0.022
Advisor - Labor Expectations	0.007	0.016	0.005	0.016
Faculty - Inclusive	0.104 ***	0.029	0.105 ***	0.029
Faculty - Unbiased	0.021	0.023	0.019	0.022
Faculty - Directive	0.052 **	0.019	0.048 **	0.019
Faculty - Collaboration	0.210 **	0.073	0.221 **	0.075
Collaboration Squared	-0.042 **	0.016	-0.045 **	0.017
Faculty - Do Not Exploit	-0.014	0.015	-0.017	0.015
Peer - Student Community	0.036	0.020	0.038 *	0.019
Peer - Do Not Compete for Attention	-0.009	0.014	-0.008	0.014
Prepared - Graduate Faculty Tasks				
Advisor - Personal	-0.048 **	0.017	-0.048 **	0.016
Advisor - Program	0.077 ***	0.021	0.080 ***	0.021
Advisor - Professional Devel.	0.141 ***	0.020	0.141 ***	0.020
Advisor - Labor Expectations	-0.102	0.053	-0.116 *	0.054
Labor Squared	0.033 **	0.012	0.036 **	0.013
Faculty - Inclusive	0.112 ***	0.026	0.111 ***	0.026
Faculty - Unbiased	0.037	0.020	0.036	0.020
Faculty - Directive	0.038 *	0.017	0.037 *	0.017
Faculty - Collaboration	0.043 *	0.017	0.040 *	0.017
Faculty - Do Not Exploit	0.003	0.013	0.004	0.013
Peer - Student Community	-0.256 **	0.093	-0.296 **	0.094
Community Squared	0.050 **	0.017	0.057 ***	0.017
Peer - Do Not Compete for Attention	-0.008	0.013	-0.008	0.013
Confident - Undergraduate Faculty				
Advisor - Personal	0.009	0.012	0.010	0.012
Advisor - Program	0.000	0.015	0.002	0.015
Advisor - Professional Devel.	-0.002	0.014	-0.005	0.014
Advisor - Labor Expectations	-0.001	0.010	-0.000	0.010
Faculty - Inclusive	-0.038 *	0.019	-0.037 *	0.018
Faculty - Unbiased	-0.205 *	0.068	-0.207 *	0.069
Unbiased Squared	0.034 **	0.013	0.037 **	0.013
Faculty - Directive	0.011	0.012	0.013	0.012
Faculty - Collaboration	-0.031 *	0.012	-0.030 *	0.012
Faculty - Do Not Exploit	0.003	0.009	0.002	0.009
Peer - Student Community	0.001	0.012	-0.001	0.012
Peer - Do Not Compete for Attention	-0.014	0.009	-0.015	0.009
Confident - Graduate Faculty Tasks				
Advisor - Personal	-0.003	0.013	-0.001	0.013
Advisor - Program	0.003	0.017	0.003	0.016
Advisor - Professional Devel.	-0.020	0.016	-0.019	0.016
Advisor - Labor Expectations	-0.013	0.011	-0.011	0.011
Faculty - Inclusive	-0.019	0.021	-0.017	0.020
Faculty - Unbiased	-0.039 *	0.016	-0.037 *	0.016
Faculty - Directive	0.001	0.013	0.002	0.013
Faculty - Collaboration	-0.019	0.014	-0.019	0.013
Faculty - Do Not Exploit	-0.001	0.010	-0.000	0.010
Peer - Student Community	-0.018	0.014	-0.017	0.014
Peer - Do Not Compete for Attention	0.012	0.010	0.011	0.010

*p = .05, **p = .01, ***p = .001 (two tailed)

Appendix 4A.1 - Coefficients from OLS Regressions of Preparation to Conduct Undergraduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates		Model 2 Support Grouped		Model 3 Indiv. Demog. Added to 2		Model 4 Social Capital Added to 3	
Social Support								
Advisor - Personal	0.137	***	0.032		0.020		0.016	
Advisor - Program	-0.216	*	-0.307	**	-0.248	*	-0.211	
Program Squared	0.069	***	0.066	***	0.055	**	0.050	**
Advisor - Professional Devel.	0.152	***	0.036		0.047	*	0.042	*
Advisor - Labor Expectations	-0.055	***	-0.024		-0.017		-0.008	
Faculty - Inclusiveness	0.226	***	0.134	***	0.134	***	0.122	***
Faculty - Unbiased	0.107	***	-0.010		-0.001		0.009	
Faculty - Supervising	0.153	***	0.067	***	0.066	***	0.067	***
Faculty - Collaboration	0.187	*	0.215	**	0.191	**	0.194	**
Collaboration Squared	-0.039	*	-0.055	***	-0.049	**	-0.045	**
Faculty - Do Not Exploit	0.049	***	-0.014		-0.015		-0.014	
Peer - Student Community	0.108	***	0.052	**	0.058	***	0.048	**
Peer – Do Not Compete for Attn,	0.044	***	-0.024		-0.020		-0.016	
Individual Demographics[b]								
Female					0.032		0.026	
African American					0.063		0.045	
Asian American					0.094		0.079	
Hispanic					-0.005		-0.023	
Other Race/Ethnicity					0.007		-0.005	
International Student					-0.054		-0.047	
Parent Highest Ed - BA					0.024		0.022	
Parent Highest Ed - MS					0.012		0.011	
Parent Highest Ed - Doc					-0.039		-0.042	
Age in the 30's					0.038		0.027	
Age in the 40's or higher					0.053		0.040	
Partnered					0.018		0.022	
Have Children					0.043		0.045	
Year in Program					0.005		0.004	
Stage in Program - Post-quals					0.022		0.022	
Stage in Program - Post-proposal					0.020		0.023	
Stage in Program - Post-defense					0.060		0.066	
Social Capital								
Have a Mentor/Second Advisor							0.060	**
Other People Integrated with Diss							-0.008	*
Student Support Outside Dept							0.038	***
Involvement in Professional Activities								
Involvement - Teaching/TA req.								
Involvement - More Teaching								
Involvement - Service								
Involvement - Res. Presentation								
Involvement - More Research								
Involvement - Internship								
Enjoyment of Faculty Tasks								
Enjoyment of Teaching								
Enjoyment of Service								
Enjoyment of Research								

[Appendix 4A.1 continues on the next page]

Measure[a]	Model 1 Support Bivariates	Model 2 Support Grouped	Model 3 Indiv. Demog. Added to 2	Model 4 Social Capital Added to 3
Organizational Factors[b]				
Private Control				
R&D Expenditures				
Future Faculty Program (National)				
Future Faculty Program (Local)				
Percentile rank				
Total number of grad students				
Student/Faculty Ratio				
% of Female				
% of Minorities				
% of Non US Citizens				
% Research Assistantship				
% Teaching Assistantship				
Median Years to PhD				
English Department				
Philosophy Department				
Art History Department				
History Department				
Sociology Department				
Psychology Department				
Chemistry Department				
Mathematics Department				
Personal Climate				
Programmatic Climate				
Professional Climate				
Advisor Labor Climate				
Inclusive Faculty Climate				
Unbiased Faculty Climate				
Faculty Supervising Climate				
Collaborative Faculty Climate				
Students Not Exploited Climate				
Student Community Climate				
Students Do Not Compete for Faculty				
Faculty Research Climate				
Students Governance Climate				
Coursework Useful Climate				
Intercept		1.183	1.018	0.937
R2		0.106	0.121	0.132

[Appendix 4A.1 continues on the next page]

Appendix 4A.1 (continued) - Coefficients from OLS Regressions of Preparation to Conduct Undergraduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4		Model 6 Enjoyment Added to 5		Model 7 Org. Contexts Added to 7	
Social Support						
Advisor - Personal	0.016		0.009		0.011	
Advisor - Program	-0.191		-0.132		-0.135	
Program Squared	0.047	*	0.036	*	0.036	
Advisor - Professional Devel.	0.035		0.030		0.035	
Advisor - Labor Expectations	-0.004		-0.004		0.007	
Faculty - Inclusiveness	0.113	***	0.114	***	0.104	***
Faculty - Unbiased	0.019		0.018		0.021	
Faculty - Supervising	0.070	***	0.072	***	0.052	**
Faculty - Collaboration	0.180	*	0.195	**	0.210	**
Collaboration Squared	-0.042	**	-0.044	**	-0.042	**
Faculty – Do Not Exploit	-0.017		-0.020		-0.014	
Peer - Student Community	0.026		0.021		0.036	
Peer – Do Not Compete for Attention	-0.013		-0.012		-0.009	
Individual Demographics[b]						
Female	0.015		0.019		0.004	
African American	0.052		0.055		0.071	
Asian American	0.097		0.104		0.109	
Hispanic	-0.003		-0.013		-0.002	
Other Race/Ethnicity	-0.022		-0.016		-0.019	
International Student	-0.020		0.001		0.029	
Parent Highest Ed - BA	0.013		0.019		0.017	
Parent Highest Ed - MS	0.008		0.015		0.014	
Parent Highest Ed - Doc	-0.044		-0.037		-0.027	
Age in the 30's	0.027		0.028		0.015	
Age in the 40's or higher	0.059		0.049		0.024	
Partnered	0.024		0.017		0.016	
Have Children	0.049		0.046		0.048	
Year in Program	0.001		0.000		-0.000	
Stage in Program - Post-quals	0.015		0.009		0.042	
Stage in Program - Post-proposal	0.021		0.015		0.062	
Stage in Program - Post-defense	0.067		0.065		0.110	*
Social Capital						
Have a Mentor/Second Advisor	0.052	**	0.045	*	0.042	*
Other People Integrated with Diss	-0.005		-0.006		-0.004	
Student Support Outside Dept	0.032	**	0.027	*	0.033	**
Involvement in Professional Activities						
Involvement - Teaching/TA req.	0.040	*	0.038	*	0.043	*
Involvement - More Teaching	0.149	***	0.141	***	0.129	***
Involvement - Service	0.060	**	0.050	*	0.044	*
Involvement - Res. Presentation	0.014		0.013		0.000	
Involvement - More Research	-0.028		-0.028		-0.021	
Involvement - Internship	0.056		0.061		0.038	
Enjoyment of Faculty Tasks						
Enjoyment of Teaching			0.066	***	0.065	***
Enjoyment of Service			0.022		0.019	
Enjoyment of Research			0.019		0.020	*

[Appendix 4A.1 continues on the next page]

Appendix 4A.1 (continued) - Coefficients from OLS Regressions of Preparation to Conduct Undergraduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4	Model 6 Enjoyment Added to 5	Model 7 Org. Contexts Added to 7
Organizational Factors[b]			
Private Control			-0.031
R&D Expenditures			-0.000
Future Faculty Program (National)			0.043
Future Faculty Program (Local)			0.041
Percentile rank			-0.001
Total number of grad students			0.000
Student/Faculty Ratio			-0.021 *
% of Female			0.000
% of Minorities			-0.002
% of Non US Citizens			-0.001
% Research Assistantship			0.001
% Teaching Assistantship			0.000
Median Years to PhD			-0.004
English Department			-0.021
Philosophy Department			-0.165
Art History Department			0.028
History Department			-0.055
Sociology Department			0.002
Psychology Department			0.103
Chemistry Department			0.082
Mathematics Department			-0.012
Personal Climate			-0.057
Programmatic Climate			0.009
Professional Climate			-0.138
Advisor Labor Climate			-0.105
Inclusive Faculty Climate			-0.042
Unbiased Faculty Climate			-0.061
Faculty Supervising Climate			0.215 ***
Collaborative Faculty Climate			-0.099
Students Not Exploited Climate			-0.016
Student Community Climate			-0.051
Students Do Not Compete for Faculty			-0.000
Faculty Research Climate			0.015
Students Governance Climate			0.108 **
Coursework Useful Climate			-0.155
Intercept	0.970	0.487	0.986
R2	0.159	0.176	0.199

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categroical measures include controls for missing values which are not shown here

[b] Referent category is White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program as appropriate

Appendix 4A.2 - Coefficients from OLS Regressions of Preparation to Conduct Graduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates		Model 2 Support Grouped		Model 3 Indiv. Demog. Added to 2		Model 4 Social Capital Added to 3	
Social Support								
Advisor - Personal	0.099	***	-0.073	***	-0.070	***	-0.071	***
Advisor - Program	0.208	***	0.053	**	0.049	*	0.055	**
Advisor - Professional Devel.	0.273	***	0.214	***	0.211	***	0.204	***
Advisor - Labor Expectations	0.068	***	-0.108		-0.099		-0.100	
Labor Squared	n/a		0.037	**	0.036	**	0.034	**
Faculty - Inclusiveness	0.272	***	0.122	***	0.116	***	0.113	***
Faculty - Unbiased	0.177	***	0.050	*	0.045	*	0.049	*
Faculty - Supervising	0.205	***	0.049	**	0.051	**	0.048	**
Faculty - Collaboration	0.173	***	0.081	***	0.085	***	0.082	***
Faculty - Do Not Exploit	0.032	***	-0.009		-0.009		-0.006	
Peer - Student Community	0.120	***	-0.256	**	-0.299	**	-0.310	***
Community Squared	n/a		0.047	**	0.057	***	0.057	***
Peer - Do Not Compete for Attn.	0.082	***	-0.016		-0.016		-0.013	
Individual Demographics[b]								
Female					-0.066	***	-0.067	***
African American					-0.009		-0.011	
Asian American					0.004		-0.004	
Hispanic					-0.006		-0.011	
Other Race/Ethnicity					-0.022		-0.029	
International Student					0.002		0.007	
Parent Highest Ed - BA					0.001		0.002	
Parent Highest Ed - MS					0.006		0.009	
Parent Highest Ed - Doc					-0.001		-0.000	
Age in the 30's					0.014		0.018	
Age in the 40's or higher					0.039		0.045	
Partnered					0.029		0.029	
Have Children					0.007		0.008	
Year in Program					0.000		0.001	
Stage in Program - Post-quals					0.032		0.026	
Stage in Program - Post-proposal					0.082	**	0.071	*
Stage in Program - Post-defense					0.177	***	0.166	***
Social Capital								
Have a Mentor/Second Advisor							0.044	*
Other People Integrated with Diss							0.007	*
Student Support Outside Dept							0.019	
Involvement in Professional Activities								
Involvement - Teaching/TA req.								
Involvement - More Teaching								
Involvement - Service								
Involvement - Res. Presentation								
Involvement - More Research								
Involvement - Internship								
Enjoyment of Faculty Tasks								
Enjoyment of Teaching								
Enjoyment of Service								
Enjoyment of Research								

[Appendix 4A.2 continues on the next page]

Appendix 4A.2 (continued) - Coefficients from OLS Regressions of Preparation to Conduct Graduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates	Model 2 Support Grouped	Model 3 Indiv. Demog. Added to 2	Model 4 Social Capital Added to 3
Organizational Factors[b]				
Private Control				
R&D Expenditures				
Future Faculty Program (National)				
Future Faculty Program (Local)				
Percentile rank				
Total number of grad students				
Student/Faculty Ratio				
% of Female				
% of Minorities				
% of Non US Citizens				
% Research Assistantship				
% Teaching Assistantship				
Median Years to PhD				
English Department				
Philosophy Department				
Art History Department				
History Department				
Sociology Department				
Psychology Department				
Chemistry Department				
Mathematics Department				
Personal Climate				
Programmatic Climate				
Professional Climate				
Advisor Labor Climate				
Inclusive Faculty Climate				
Unbiased Faculty Climate				
Faculty Supervising Climate				
Collaborative Faculty Climate				
Students Not Exploited Climate				
Student Community Climate				
Students Do Not Compete for Faculty				
Faculty Research Climate				
Students Governance Climate				
Coursework Useful Climate				
Intercept		1.350	1.311	1.310
R2		0.224	0.245	0.250

[Appendix 4A.2 continues on the next page]

Appendix 4A.2 (continued) - Coefficients from OLS Regressions of Preparation to Conduct Graduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4		Model 6 Enjoyment Added to 5		Model 7 Org. Contexts Added to 7	
Social Support						
Advisor - Personal	-0.070	***	-0.054	***	-0.048	**
Advisor - Program	0.067	***	0.058	**	0.077	***
Advisor - Professional Devel.	0.185	***	0.158	***	0.141	***
Advisor - Labor Expectations	-0.104		-0.097		-0.102	
Labor Squared	0.033	**	0.032	**	0.033	**
Faculty - Inclusiveness	0.105	***	0.098	***	0.112	***
Faculty - Unbiased	0.050	*	0.046	*	0.037	
Faculty - Supervising	0.046	**	0.046	**	0.038	*
Faculty - Collaboration	0.060	***	0.073	***	0.043	*
Faculty - Do Not Exploit	-0.004		-0.005		0.003	
Peer - Student Community	-0.303	**	-0.249	**	-0.256	**
Community Squared	0.055	***	0.046	**	0.050	**
Peer - Do Not Compete for Attention	-0.013		-0.011		-0.008	
Individual Demographics[b]						
Female	-0.079	***	-0.073	***	-0.083	***
African American	-0.014		0.002		0.004	
Asian American	0.000		0.017		-0.005	
Hispanic	-0.009		-0.030		-0.032	
Other Race/Ethnicity	-0.013		-0.007		-0.006	
International Student	0.026		-0.016		0.006	
Parent Highest Ed - BA	0.004		0.007		0.001	
Parent Highest Ed - MS	0.013		0.016		0.012	
Parent Highest Ed - Doc	0.005		-0.003		-0.002	
Age in the 30's	0.020		0.003		0.008	
Age in the 40's or higher	0.057		0.025		0.028	
Partnered	0.026		0.024		0.023	
Have Children	0.013		0.021		0.020	
Year in Program	-0.002		0.002		0.001	
Stage in Program - Post-quals	0.023		0.008		0.017	
Stage in Program - Post-proposal	0.061		0.042		0.053	
Stage in Program - Post-defense	0.145	***	0.116	**	0.129	***
Social Capital						
Have a Mentor/Second Advisor	0.037	*	0.029		0.033	
Other People Integrated with Diss	0.005		0.007	*	-0.004	
Student Support Outside Dept	0.018		0.019	*	0.021	*
Involvement in Professional Activities						
Involvement - Teaching/TA req.	0.026		0.026		0.014	
Involvement - More Teaching	-0.011		0.003		0.016	
Involvement - Service	0.003		-0.002		0.001	
Involvement - Res. Presentation	0.063	***	0.049	**	0.023	
Involvement - More Research	0.097	***	0.082	***	0.063	**
Involvement - Internship	0.092	**	0.093	**	0.068	*
Enjoyment of Faculty Tasks						
Enjoyment of Teaching			-0.006		-0.006	
Enjoyment of Service			-0.001		-0.005	
Enjoyment of Research			0.096	***	0.093	***

[Appendix 4A.2 continues on the next page]

Appendix 4A.2 (continued) - Coefficients from OLS Regressions of Preparation to Conduct Graduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4	Model 6 Enjoyment Added to 5	Model 7 Org. Contexts Added to 7
Organizational Factors[b]			
Private Control			-0.021
R&D Expenditures			-0.000
Future Faculty Program (National)			-0.016
Future Faculty Program (Local)			0.023
Percentile rank			0.000
Total number of grad students			0.000
Student/Faculty Ratio			-0.009
% of Female			-0.001
% of Minorities			0.002
% of Non US Citizens			-0.001
% Research Assistantship			-0.000
% Teaching Assistantship			-0.001
Median Years to PhD			-0.006
English Department			-0.089
Philosophy Department			-0.172
Art History Department			0.028
History Department			-0.066
Sociology Department			-0.062
Psychology Department			0.047
Chemistry Department			0.122
Mathematics Department			-0.133
Personal Climate			-0.071
Programmatic Climate			-0.008
Professional Climate			-0.017
Advisor Labor Climate			-0.112 *
Inclusive Faculty Climate			-0.028
Unbiased Faculty Climate			-0.032
Faculty Supervising Climate			0.042
Collaborative Faculty Climate			0.054
Students Not Exploited Climate			-0.054
Student Community Climate			-0.087
Students Do Not Compete for Faculty			-0.020
Faculty Research Climate			0.100
Students Governance Climate			0.056
Coursework Useful Climate			-0.187 **
Intercept	1.352	0.963	1.363
R2	0.265	0.304	0.328

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categroical measures include controls for missing values which are not shown here

[b] Referent category is White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program as appropriate

Appendix 4A.3 - Coefficients from OLS Regressions of Confidence to Conduct Undergraduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates		Model 2 Support Grouped		Model 3 Indiv. Demog. Added to 2		Model 4 Social Capital Added to 3	
Social Support								
Advisor - Personal	0.060	***	0.041	**	0.031	*	0.028	*
Advisor - Program	0.057	***	0.012		0.016		0.024	
Advisor - Professional Devel.	0.051	***	0.021		0.029		0.021	
Advisor - Labor Expectations	-0.026	**	-0.012		-0.003		0.002	
Faculty - Inclusiveness	0.027	*	0.010		0.000		-0.009	
Faculty - Biased	-0.287	***	-0.294	***	-0.272	***	-0.264	***
Biased Squared	0.051	***	0.047	**	0.046	**	0.046	**
Faculty - Supervising	0.026	*	0.023		0.027	*	0.026	
Faculty - Collaboration	-0.025	**	-0.030	**	-0.025	*	-0.013	
Faculty - Do Not Exploit	-0.005		-0.011		-0.007		-0.005	
Peer - Student Community	0.042	***	0.042	***	0.039	**	0.030	*
Peer - Do Not Compete for Attn.	0.002		-0.004		0.000		0.004	
Individual Demographics[b]								
Female					-0.031	*	-0.035	*
African American					0.121	**	0.106	*
Asian American					-0.010		-0.024	
Hispanic					0.066		0.050	
Other Race/Ethnicity					0.002		-0.012	
International Student					-0.185	***	-0.178	***
Parent Highest Ed - BA					0.002		0.001	
Parent Highest Ed - MS					-0.033		-0.032	
Parent Highest Ed - Doc					-0.046	*	-0.047	*
Age in the 30's					0.012		0.005	
Age in the 40's or higher					0.041		0.032	
Partnered					0.033	*	0.038	*
Have Children					-0.007		-0.005	
Year in Program					0.009	*	0.008	*
Stage in Program - Post-quals					0.030		0.023	
Stage in Program - Post-proposal					0.045		0.039	
Stage in Program - Post-defense					0.037		0.032	
Social Capital								
Have a Mentor/Second Advisor							0.060	***
Other People Integrated with Diss							-0.004	
Student Support Outside Dept							0.037	***
Involvement in Professional Activities								
Involvement - Teaching/TA req.								
Involvement - More Teaching								
Involvement - Service								
Involvement - Res. Presentation								
Involvement - More Research								
Involvement - Internship								
Enjoyment of Faculty Tasks								
Enjoyment of Teaching								
Enjoyment of Service								
Enjoyment of Research								
Preparation								
Prepared - Undergraduate Tasks								
Prepared - Graduate Tasks								

[Appendix 4A.3 continues on the next page]

Appendix 4A.3 (continued) - **Coefficients from OLS Regressions of Confidence to Conduct Undergraduate Faculty Tasks on Social Support and Individual & Organizational Controls**

Measure[a]	Model 1 Support Bivariates	Model 2 Support Grouped	Model 3 Indiv. Demog. Added to 2	Model 4 Social Capital Added to 3
Organizational Factors[b]				
Private Control				
R&D Expenditures				
Future Faculty Program (National)				
Future Faculty Program (Local)				
Percentile rank				
Total number of grad students				
Student/Faculty Ratio				
% of Female				
% of Minorities				
% of Non US Citizens				
% Research Assistantship				
% Teaching Assistantship				
Median Years to PhD				
English Department				
Philosophy Department				
Art History Department				
History Department				
Sociology Department				
Psychology Department				
Chemistry Department				
Mathematics Department				
Personal Climate				
Programmatic Climate				
Professional Climate				
Advisor Labor Climate				
Inclusive Faculty Climate				
Unbiased Faculty Climate				
Faculty Supervising Climate				
Collaborative Faculty Climate				
Students Not Exploited Climate				
Student Community Climate				
Students Do Not Compete for Faculty				
Faculty Research Climate				
Students Governance Climate				
Coursework Useful Climate				
Intercept		2.309	2.285	2.248
R^2		0.041	0.089	0.107

[Appendix 4A.3 continues on the next page]

Appendix 4A.3 (continued) - Coefficients from OLS Regressions of Confidence to Conduct Undergraduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4		Model 6 Enjoyment Added to 5		Model 7 Preparation Added to 6		Model 8 Org. Contexts Added to 7	
Social Support								
Advisor - Personal	0.029	*	0.010		0.010		0.009	
Advisor - Program	0.026		0.027		0.007		0.000	
Advisor - Professional Devel.	0.009		0.006		-0.007		-0.002	
Advisor - Labor Expectations	0.005		0.002		0.001		-0.001	
Faculty - Inclusiveness	-0.017		-0.015		-0.045	**	-0.038	*
Faculty - Biased	-0.269	***	-0.198	**	-0.209	**	-0.205	**
Biased Squared	0.049	***	0.034	*	0.035	**	0.034	**
Faculty - Supervising	0.030	*	0.031	*	0.013		0.011	
Faculty - Collaboration	-0.019		-0.007		-0.009		-0.031	*
Faculty - Do Not Exploit	-0.006		-0.009		-0.004		-0.003	
Peer - Student Community	0.010		0.000		-0.004		0.001	
Peer - Do Not Compete for Attn.	0.008		0.011		0.014		0.014	
Individual Demographics[b]								
Female	-0.045	***	-0.043	***	-0.045	***	-0.043	***
African American	0.113	**	0.120	**	0.107	**	0.113	**
Asian American	-0.008		-0.000		-0.027		-0.035	
Hispanic	0.066		0.055		0.058		0.067	*
Other Race/Ethnicity	-0.021		-0.013		-0.012		-0.009	
International Student	-0.152	***	-0.094	***	-0.093	***	-0.107	***
Parent Highest Ed - BA	-0.003		0.010		0.006		0.011	
Parent Highest Ed - MS	-0.033		-0.019		-0.023		-0.015	
Parent Highest Ed - Doc	-0.046	*	-0.030		-0.021		-0.011	
Age in the 30's	0.004		0.009		0.002		0.004	
Age in the 40's or higher	0.047		0.037		0.022		0.028	
Partnered	0.038	*	0.023		0.018		0.022	
Have Children	-0.002		-0.011		-0.022		-0.028	
Year in Program	0.005		0.004		0.003		0.004	
Stage in Program - Post-quals	0.018		0.013		0.011		0.006	
Stage in Program - Post-proposal	0.038		0.028		0.023		0.014	
Stage in Program - Post-defense	0.030		0.029		0.008		-0.005	
Social Capital								
Have a Mentor/Second Advisor	0.049	***	0.039	**	0.027	*	0.027	*
Other People Integrated with Diss	-0.002		-0.004		-0.003		-0.006	*
Student Support Outside Dept	0.033	***	0.023	**	0.015	*	0.016	*
Involvement in Professional Activities								
Involvement - Teaching/TA req.	0.008		0.005		-0.006		-0.011	
Involvement - More Teaching	0.083	***	0.062	***	0.028	*	0.035	**
Involvement - Service	0.068	***	0.047	***	0.035	**	0.032	*
Involvement - Res. Presentation	0.040	**	0.042	**	0.039	**	0.032	*
Involvement - More Research	0.017		0.022		0.025		0.024	
Involvement - Internship	0.002		0.010		-0.007		0.003	
Enjoyment of Faculty Tasks								
Enjoyment of Teaching			0.130	***	0.114	***	0.114	***
Enjoyment of Service			0.052	***	0.047	***	0.044	***
Enjoyment of Research			0.012		0.004		0.005	
Preparation								
Prepared - Undergraduate Tasks					0.240	***	0.244	***
Prepared - Graduate Tasks					0.035	*	0.033	

[Appendix 4A.3 continues on the next page]

Appendix 4A.3 (continued) - Coefficients from OLS Regressions of Confidence to Conduct Undergraduate Faculty Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4	Model 6 Enjoyment Added to 5	Model 7 Preparation Added to 6	Model 8 Org. Contexts Added to 7
Organizational Factors[b]				
Private Control				-0.005
R&D Expenditures				-0.000
Future Faculty Program (National)				-0.040 *
Future Faculty Program (Local)				-0.042
Percentile rank				-0.001
Total number of grad students				0.000
Student/Faculty Ratio				-0.009
% of Female				0.000
% of Minorities				-0.001
% of Non US Citizens				0.000
% Research Assistantship				0.001
% Teaching Assistantship				0.000
Median Years to PhD				-0.009
English Department				-0.010
Philosophy Department				-0.009
Art History Department				0.005
History Department				-0.047
Sociology Department				0.026
Psychology Department				-0.051
Chemistry Department				-0.040
Mathematics Department				-0.091
Personal Climate				-0.017
Programmatic Climate				0.081
Professional Climate				0.027
Advisor Labor Climate				-0.032
Inclusive Faculty Climate				-0.034
Unbiased Faculty Climate				0.032
Faculty Supervising Climate				0.031
Collaborative Faculty Climate				0.029
Students Not Exploited Climate				0.011
Student Community Climate				-0.050
Students Do Not Compete for Faculty				0.015
Faculty Research Climate				-0.043
Students Governance Climate				-0.046 *
Coursework Useful Climate				0.071
Intercept	2.330	1.555	1.445	1.840
R2	0.135	0.263	0.368	0.383

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categroical measures include controls for missing values which are not shown here

[b] Referent category is White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program as appropriate

Appendix 4A.4 - Coefficients from OLS Regressions of Confidence to Conduct Graduate Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates	Model 2 Support Grouped		Model 3 Indiv. Demog. Added to 2		Model 4 Social Capital Added to 3	
Social Support							
Advisor - Personal	0.041	-0.060	***	-0.056	***	-0.058	***
Advisor - Program	0.099	0.018		0.015		0.022	
Advisor - Professional Devel.	0.147	0.154	***	0.152	***	0.145	***
Advisor - Labor Expectations	0.029	0.002		0.010		0.009	
Faculty - Inclusiveness	0.098	0.065	**	0.050	*	0.043	
Faculty - Unbiased	0.028	-0.035		-0.034		-0.026	
Faculty - Supervising	0.087	0.027		0.027		0.025	
Faculty - Collaboration	0.064	0.024		0.029	*	0.034	*
Faculty - Do Not Exploit	-0.005	-0.011		-0.009		-0.006	
Peer - Student Community	0.030	-0.024		-0.010		-0.017	
Peer - Do Not Compete for Attn	0.025	-0.000		0.000		0.003	
Individual Demographics[b]							
Female				-0.090	***	-0.092	***
African American				0.027		0.024	
Asian American				-0.096		-0.107	*
Hispanic				0.097	*	0.087	
Other Race/Ethnicity				0.050		0.039	
International Student				-0.004		0.004	
Parent Highest Ed - BA				0.015		0.014	
Parent Highest Ed - MS				-0.028		-0.026	
Parent Highest Ed - Doc				-0.014		-0.012	
Age in the 30's				0.038		0.037	
Age in the 40's or higher				0.107	***	0.105	***
Partnered				0.036	*	0.037	*
Have Children				-0.028		-0.028	
Year in Program				-0.001		-0.001	
Stage in Program - Post-quals				0.071	*	0.060	
Stage in Program - Post-proposal				0.134	***	0.120	***
Stage in Program - Post-defense				0.192	***	0.179	***
Social Capital							
Have a Mentor/Second Advisor						0.067	***
Other People Integrated with Diss						0.002	
Student Support Outside Dept						0.021	*
Involvement in Professional Activities							
Involvement - Teaching/TA req.							
Involvement - More Teaching							
Involvement - Service							
Involvement - Res. Presentation							
Involvement - More Research							
Involvement - Internship							
Enjoyment of Faculty Tasks							
Enjoyment of Teaching							
Enjoyment of Service							
Enjoyment of Research							
Preparation							
Prepared - Undergraduate Tasks							
Prepared - Graduate Tasks							

[Appendix 4A.4 continues on the next page]

Appendix 4A.4 (continued)- Coefficients from OLS Regressions of Confidence to Conduct Graduate Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates	Model 2 Support Grouped	Model 3 Indiv. Demog. Added to 2	Model 4 Social Capital Added to 3
Organizational Factors[b]				
Private Control				
R&D Expenditures				
Future Faculty Program (National)				
Future Faculty Program (Local)				
Percentile rank				
Total number of grad students				
Student/Faculty Ratio				
% of Female				
% of Minorities				
% of Non US Citizens				
% Research Assistantship				
% Teaching Assistantship				
Median Years to PhD				
English Department				
Philosophy Department				
Art History Department				
History Department				
Sociology Department				
Psychology Department				
Chemistry Department				
Mathematics Department				
Personal Climate				
Programmatic Climate				
Professional Climate				
Advisor Labor Climate				
Inclusive Faculty Climate				
Unbiased Faculty Climate				
Faculty Supervising Climate				
Collaborative Faculty Climate				
Students Not Exploited Climate				
Student Community Climate				
Students Do Not Compete for Faculty				
Faculty Research Climate				
Students Governance Climate				
Coursework Useful Climate				
Intercept		1.759	1.647	1.636
R2		0.066	0.108	0.119

[Appendix 4A.4 continues on the next page]

Appendix 4A.4 (continued) - Coefficients from OLS Regressions of Confidence to Conduct Graduate Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4		Model 6 Enjoyment Added to 5		Model 7 Preparation Added to 6		Model 8 Org. Contexts Added to 7	
Social Support								
Advisor - Personal	-0.057	***	-0.036	*	-0.003		-0.003	
Advisor - Program	0.035		0.023		-0.001		0.003	
Advisor - Professional Devel.	0.121	***	0.075	***	-0.010		-0.020	
Advisor - Labor Expectations	0.001		0.006		-0.013		-0.013	
Faculty - Inclusiveness	0.033		0.018		-0.025		-0.019	
Faculty - Unbiased	-0.022		-0.025		-0.044	**	-0.039	*
Faculty - Supervising	0.025		0.026		0.009		0.001	
Faculty - Collaboration	0.009		0.033	*	-0.008		-0.019	
Faculty - Do Not Exploit	-0.003		-0.006		-0.007		-0.001	
Peer - Student Community	-0.029		-0.024		-0.025	*	-0.018	
Peer - Do Not Compete for Attn.	0.005		0.010		0.012		0.012	
Individual Demographics[b]								
Female	-0.108	***	-0.098	***	-0.057	***	-0.067	***
African American	0.021		0.051		0.058		0.057	
Asian American	-0.102	*	-0.071		-0.066		-0.075	
Hispanic	0.088		0.057		0.074	*	0.069	
Other Race/Ethnicity	0.054		0.061		0.064		0.059	
International Student	0.029		-0.017		-0.007		0.004	
Parent Highest Ed - BA	0.018		0.027		0.023		0.026	
Parent Highest Ed - MS	-0.021		-0.013		-0.021		-0.017	
Parent Highest Ed - Doc	-0.005		-0.010		-0.016		-0.008	
Age in the 30's	0.037		0.012		0.014		0.003	
Age in the 40's or higher	0.119	***	0.061	*	0.053	*	0.038	
Partnered	0.033		0.028		0.018		0.016	
Have Children	-0.023		-0.013		-0.021		-0.026	
Year in Program	-0.004		0.001		0.001		0.000	
Stage in Program - Post-quals	0.055		0.034		0.030		0.040	
Stage in Program - Post-proposal	0.106	***	0.073	*	0.052	*	0.068	**
Stage in Program - Post-defense	0.152	***	0.108	**	0.050		0.070	*
Social Capital								
Have a Mentor/Second Advisor	0.056	**	0.042	*	0.031	*	0.025	
Other People Integrated with Diss	0.000		0.003		-0.003		-0.002	
Student Support Outside Dept	0.020	*	0.020	*	0.014		0.014	
Involvement in Professional Activities								
Involvement - Teaching/TA req.	0.025		0.022		0.009		0.019	
Involvement - More Teaching	-0.018		-0.001		0.017		0.025	
Involvement - Service	0.026		0.013		0.020		0.015	
Involvement - Res. Presentation	0.100	***	0.076	***	0.051	***	0.033	*
Involvement - More Research	0.105	***	0.083	***	0.032	*	0.030	
Involvement - Internship	0.068	*	0.070	*	0.021		0.006	
Enjoyment of Faculty Tasks								
Enjoyment of Teaching			0.028	**	0.040	***	0.039	***
Enjoyment of Service			0.014		0.018	*	0.016	
Enjoyment of Research			0.162	***	0.108	***	0.107	***
Preparation								
Prepared - Undergraduate Tasks					-0.136	***	-0.135	***
Prepared - Graduate Tasks					0.576	***	0.568	***

[Appendix 4A.4 continues on the next page]

Appendix 4A.4 (continued) - Coefficients from OLS Regressions of Confidence to Conduct Graduate Tasks on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4	Model 6 Enjoyment Added to 5	Model 7 Preparation Added to 6	Model 8 Org. Contexts Added to 7
Organizational Factors[b]				
Private Control				-0.045 *
R&D Expenditures				0.000
Future Faculty Program (National)				-0.016
Future Faculty Program (Local)				0.008
Percentile rank				-0.001
Total number of grad students				-0.000
Student/Faculty Ratio				0.009
% of Female				-0.000
% of Minorities				0.001
% of Non US Citizens				0.001
% Research Assistantship				0.000
% Teaching Assistantship				-0.000
Median Years to PhD				-0.009
English Department				0.083
Philosophy Department				-0.018
Art History Department				0.058
History Department				0.049
Sociology Department				0.047
Psychology Department				0.008
Chemistry Department				-0.110 *
Mathematics Department				-0.162 **
Personal Climate				-0.037
Programmatic Climate				-0.024
Professional Climate				0.091
Advisor Labor Climate				0.006
Inclusive Faculty Climate				-0.076
Unbiased Faculty Climate				0.007
Faculty Supervising Climate				0.037
Collaborative Faculty Climate				0.066
Students Not Exploited Climate				0.024
Student Community Climate				-0.040
Students Do Not Compete for Faculty				0.042
Faculty Research Climate				-0.109 *
Students Governance Climate				-0.035
Coursework Useful Climate				-0.060
Intercept	1.725	0.999	0.767	1.712
R2	0.146	0.266	0.484	0.496

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categroical measures include controls for missing values which are not shown here

[b] Referent category is White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program as appropriate

Appendix 4B.1 - Coefficients from Multinomial Regressions of Preference for Working at Liberal Arts Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates		Model 2 Support Grouped		Model 3 Indiv. Demog. Added to 2		Model 4 Social Capital Added to 3	
Social Support								
Advisor - Personal	-0.014		0.486	***	0.404	***	0.417	***
Advisor - Program	-0.398	***	-0.324	**	-0.252	*	-0.244	
Advisor - Professional Devel.	-0.428	***	-0.486	***	-0.494	***	-0.510	***
Advisor - Labor Expectations	-0.042		-0.010		0.063		0.017	
Faculty - Inclusiveness	-0.410	***	-0.316	*	-0.355	*	-0.316	*
Faculty - Unbiased	-0.315	***	-0.071		0.061		0.033	
Faculty - Supervising	-0.267	***	0.004		0.081		0.064	
Faculty - Collaboration	-0.189	**	-0.082		-0.027		-0.093	
Faculty - Do Not Exploit	-0.198	**	-0.168	*	-0.196	*	-0.195	*
Peer - Student Community	0.153		0.443	***	0.321	**	0.324	**
Peer - Do Not Compete for Attn.	-0.105		-0.001		0.044		0.044	
Individual Demographics[b]								
Female					0.439	***	0.447	***
African American					-0.467		-0.464	
Asian American					0.191		0.210	
Hispanic					-0.441		-0.407	
Other Race/Ethnicity					-0.428		-0.401	
International Student					-2.318	***	-2.344	***
Parent Highest Ed - BA					-0.130		-0.119	
Parent Highest Ed - MS					-0.052		-0.037	
Parent Highest Ed - Doc					-0.054		-0.054	
Age in the 30's					-0.042		0.005	
Age in the 40's or higher					0.094		0.161	
Partnered					0.213		0.216	
Have Children					0.037		0.044	
Year in Program					0.052		0.055	
Stage in Program - Post-quals					-0.062		-0.084	
Stage in Program - Post-proposal					0.170		0.128	
Stage in Program - Post-defense					-0.356		-0.426	
Social Capital								
Have a Mentor/Second Advisor							-0.241	*
Other People Integrated w/ Diss							0.043	*
Student Support Outside Dept							0.032	
Involvement in Professional Activities								
Involvement - Teaching/TA req.								
Involvement - More Teaching								
Involvement - Service								
Involvement - Res. Presentation								
Involvement - More Research								
Involvement - Internship								
Enjoyment of Faculty Tasks								
Enjoyment of Teaching								
Enjoyment of Service								
Enjoyment of Research								
Preparation & Confidence								
Prepared - Undergraduate Tasks								
Prepared - Graduate Tasks								
Confident - Undergraduate Tasks								
Confident - Graduate Tasks								

[Appendix 4B.1 continues on the next page]

Appendix 4B.1 (continued) - Coefficients from Multinomial Regressions of Preference for Working at
Liberal Arts Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates	Model 2 Support Grouped	Model 3 Indiv. Demog. Added to 2	Model 4 Social Capital Added to 3
Organizational Factors[b]				
Private Control				
R&D Expenditures				
Future Faculty Program (National)				
Future Faculty Program (Local)				
Percentile rank				
Total number of grad students				
Student/Faculty Ratio				
% of Female				
% of Minorities				
% of Non US Citizens				
% Research Assistantship				
% Teaching Assistantship				
Median Years to PhD				
English Department				
Philosophy Department				
Art History Department				
History Department				
Sociology Department				
Psychology Department				
Chemistry Department				
Mathematics Department				
Personal Climate				
Programmatic Climate				
Professional Climate				
Advisor Labor Climate				
Inclusive Faculty Climate				
Unbiased Faculty Climate				
Faculty Supervising Climate				
Collaborative Faculty Climate				
Students Not Exploited Climate				
Student Community Climate				
Students Do Not Compete for Faculty				
Faculty Research Climate				
Students Governance Climate				
Coursework Useful Climate				
Intercept		0.325	0.333	0.388
Pseudo R2		0.052	0.121	0.128

[Appendix 4B.1 continues on the next page]

Appendix 4B.1 (continued) - Coefficients from Multinomial Regressions of Preference for Working at Liberal Arts Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4		Model 6 Enjoyment Added to 5		Model 7 Prep. & Confid. Added to 6		Model 8 Org. Contexts Added to 7	
Social Support								
Advisor - Personal	0.418	***	0.248	*	0.213		0.181	
Advisor - Program	-0.295	*	-0.249		-0.233		-0.112	
Advisor - Professional Devel.	-0.462	***	-0.239		-0.136		-0.213	
Advisor - Labor Expectations	0.065		0.020		0.038		0.085	
Faculty - Inclusiveness	-0.313		-0.257		-0.191		-0.322	
Faculty - Unbiased	0.056		0.058		0.045		0.031	
Faculty - Supervising	0.085		0.105		0.146		0.151	
Faculty - Collaboration	-0.005		-0.083		-0.034		0.264	*
Faculty - Do Not Exploit	-0.214	**	-0.239	**	-0.253	**	-0.245	*
Peer - Student Community	0.299	**	0.260	*	0.241	*	0.304	*
Peer - Do Not Compete for Attn.	0.053		0.048		0.056		0.043	
Individual Demographics[b]								
Female	0.472	***	0.487	***	0.402	***	0.547	***
African American	-0.429		-0.664	*	-0.697	*	-0.504	
Asian American	0.243		0.205		0.182		0.263	
Hispanic	-0.370		-0.287		-0.284		-0.070	
Other Race/Ethnicity	-0.525		-0.630		-0.570		-0.382	
International Student	-2.380	***	-1.955	***	-1.953	***	-1.971	***
Parent Highest Ed - BA	-0.163		-0.194		-0.158		-0.140	
Parent Highest Ed - MS	-0.065		-0.062		-0.069		-0.055	
Parent Highest Ed - Doc	-0.080		0.006		-0.000		0.103	
Age in the 30's	-0.010		0.198		0.215		0.128	
Age in the 40's or higher	0.166		0.488	*	0.547	*	0.367	
Partnered	0.230	*	0.251	*	0.280	*	0.230	
Have Children	0.042		-0.098		-0.108		-0.051	
Year in Program	0.057		0.029		0.033		0.033	
Stage in Program - Post-quals	-0.094		0.038		0.052		0.176	
Stage in Program - Post-proposal	0.156		0.378		0.443		0.360	
Stage in Program - Post-defense	-0.368		-0.093		0.015		0.068	
Social Capital								
Have a Mentor/Second Advisor	-0.245	*	-0.252	*	-0.229		-0.314	*
Other People Integrated with Diss	0.059	**	0.044		0.050	*	-0.006	
Student Support Outside Dept	0.018		-0.054		-0.029		-0.028	
Involvement in Professional Activities								
Involvement - Teaching/TA req.	-0.035		-0.063		-0.024		-0.041	
Involvement - More Teaching	0.474	***	0.329	*	0.322	*	0.218	
Involvement - Service	0.096		0.058		0.070		0.168	
Involvement - Res. Presentation	-0.148		-0.012		0.056		-0.002	
Involvement - More Research	-0.507	***	-0.417	**	-0.340	*	-0.134	
Involvement - Internship	-0.287		-0.329		-0.227		-0.021	
Enjoyment of Faculty Tasks								
Enjoyment of Teaching			0.598	***	0.588	***	0.591	***
Enjoyment of Service			0.314	***	0.312	***	0.261	***
Enjoyment of Research			-1.173	***	-0.985	***	-1.098	***
Preparation & Confidence								
Prepared - Undergraduate Tasks					-0.265		-0.368	
Prepared - Graduate Tasks					-0.035		-0.005	
Confident - Undergraduate Tasks					0.626	**	0.682	**
Confident - Graduate Tasks					-1.312	***	-1.459	***

[Appendix 4B.1 continues on the next page]

Appendix 4B.1 (continued) - Coefficients from Multinomial Regressions of Preference for Working at Liberal Arts Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4	Model 6 Enjoyment Added to 5	Model 7 Prep. & Confid. Added to 6	Model 8 Org. Contexts Added to 7
Organizational Factors[b]				
Private Control				0.136
R&D Expenditures				-0.001
Future Faculty Program (National)				0.448 *
Future Faculty Program (Local)				-0.281
Percentile rank				-0.007
Total number of grad students				0.007 ***
Student/Faculty Ratio				-0.239 ***
% of Female				-0.010
% of Minorities				-0.033 *
% of Non US Citizens				-0.021 *
% Research Assistantship				0.011
% Teaching Assistantship				0.015 **
Median Years to PhD				0.124 *
English Department				-1.375
Philosophy Department				-0.806
Art History Department				0.144
History Department				-0.753
Sociology Department				-1.638 **
Psychology Department				-1.375 *
Chemistry Department				0.554
Mathematics Department				-2.289 ***
Personal Climate				0.944 *
Programmatic Climate				-0.320
Professional Climate				0.526
Advisor Labor Climate				-0.786 *
Inclusive Faculty Climate				-1.597 *
Unbiased Faculty Climate				0.250
Faculty Supervising Climate				0.044
Collaborative Faculty Climate				-0.153
Students Not Exploited Climate				0.393
Student Community Climate				-0.099
Students Do Not Compete for Faculty				0.163
Faculty Research Climate				0.806
Students Governance Climate				0.328
Coursework Useful Climate				0.949
Intercept	0.269	1.253	1.844	2.679
Pseudo R2	0.140	0.280	0.298	0.356

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program as appropriate

Appendix 4B.2 - Coefficients from Multinomial Regressions of Expectations for Working at Liberal Arts Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates		Model 2 Support Grouped		Model 3 Indiv. Demog. Added to 2		Model 4 Social Capital Added to 3	
Social Support								
Advisor - Personal	-0.070		0.396	*	0.289		0.290	
Advisor - Program	-0.342	*	-0.047		0.014		0.024	
Advisor - Professional Devel.	-0.531	***	-0.708	***	-0.684	***	-0.695	***
Advisor - Labor Expectations	-0.004		0.100		0.172		0.159	
Faculty - Inclusiveness	-0.339	*	-0.287		-0.374		-0.361	
Faculty - Unbiased	-0.124		0.252		0.409	*	0.406	*
Faculty - Supervising	-0.372	**	-0.177		-0.133		-0.137	
Faculty - Collaboration	-0.330	**	-0.297	*	-0.244		-0.257	
Faculty - Do Not Exploit	-0.225	*	-0.326	**	-0.371	**	-0.369	**
Peer - Student Community	0.281	*	0.545	***	0.478	**	0.472	**
Peer – Do Not Compete for Attn	0.041		0.126		0.164		0.163	
Individual Demographics[b]								
Female					0.492	**	0.495	**
African American					-0.803	*	-0.817	*
Asian American					0.263		0.245	
Hispanic					-1.086	*	-1.094	*
Other Race/Ethnicity					-1.134	*	-1.132	*
International Student					-1.543	***	-1.537	***
Parent Highest Ed - BA					-0.133		-0.130	
Parent Highest Ed - MS					-0.127		-0.130	
Parent Highest Ed - Doc					-0.150		-0.153	
Age in the 30's					0.395	*	0.403	*
Age in the 40's or higher					0.974	*	0.986	**
Partnered					0.203		0.202	
Have Children					-0.065		-0.068	
Year in Program					0.003		0.005	
Stage in Program - Post-quals					-0.075		-0.078	
Stage in Program - Post-proposal					0.154		0.145	
Stage in Program - Post-defense					-0.773	*	-0.781	*
Social Capital								
Have a Mentor/Second Advisor							0.018	
Other People Integrated with Diss							0.014	
Student Support Outside Dept							0.042	
Involvement in Professional Activities								
Involvement - Teaching/TA req.								
Involvement - More Teaching								
Involvement - Service								
Involvement - Res. Presentation								
Involvement - More Research								
Involvement - Internship								
Enjoyment of Faculty Tasks								
Enjoyment of Teaching								
Enjoyment of Service								
Enjoyment of Research								
Preparation & Confidence								
Prepared - Undergraduate Tasks								
Prepared - Graduate Tasks								
Confident - Undergraduate Tasks								
Confident - Graduate Tasks								

[Appendix 4B.2 continues on the next page]

Appendix 4B.2 (continued) - Coefficients from Multinomial Regressions of Expectations for Working at Liberal Arts Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls

Measure[a]	Model 1 Support Bivariates	Model 2 Support Grouped	Model 3 Indiv. Demog. Added to 2	Model 4 Social Capital Added to 3
Organizational Factors[b]				
Private Control				
R&D Expenditures				
Future Faculty Program (National)				
Future Faculty Program (Local)				
Percentile rank				
Total number of grad students				
Student/Faculty Ratio				
% of Female				
% of Minorities				
% of Non US Citizens				
% Research Assistantship				
% Teaching Assistantship				
Median Years to PhD				
English Department				
Philosophy Department				
Art History Department				
History Department				
Sociology Department				
Psychology Department				
Chemistry Department				
Mathematics Department				
Personal Climate				
Programmatic Climate				
Professional Climate				
Advisor Labor Climate				
Inclusive Faculty Climate				
Unbiased Faculty Climate				
Faculty Supervising Climate				
Collaborative Faculty Climate				
Students Not Exploited Climate				
Student Community Climate				
Students Do Not Compete for Faculty				
Faculty Research Climate				
Students Governance Climate				
Coursework Useful Climate				
Intercept		1.898	2.177	2.077
Pseudo R2		0.035	0.077	0.081

[Appendix 4B.2 continues on the next page]

Appendix 4B.2 (continued) - Coefficients from Multinomial Regressions of Expectations for Working at Liberal Arts Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4		Model 6 Enjoyment Added to 5		Model 7 Prep. & Confid. Added to 6		Model 8 Org. Contexts Added to 7	
Social Support								
Advisor - Personal	0.277		0.111		0.067		0.084	
Advisor - Program	-0.018		0.064		0.101		0.086	
Advisor - Professional Devel.	-0.655	***	-0.482	*	-0.383		-0.470	*
Advisor - Labor Expectations	0.198		0.165		0.194		0.152	
Faculty - Inclusiveness	-0.358		-0.300		-0.258		-0.472	
Faculty - Unbiased	0.429	*	0.403	*	0.367		0.478	*
Faculty - Supervising	-0.126		-0.129		-0.095		-0.183	
Faculty - Collaboration	-0.175		-0.197		-0.151		0.083	
Faculty - Do Not Exploit	-0.394	**	-0.411	**	-0.418	**	-0.402	**
Peer - Student Community	0.457	**	0.393	*	0.365	*	0.412	
Peer - Do Not Compete for Attn.	0.155		0.168		0.196		0.103	
Individual Demographics[b]								
Female	0.536	**	0.527	**	0.412	*	0.588	**
African American	-0.751		-0.912	*	-0.871	*	-0.774	
Asian American	0.298		0.201		0.169		0.329	
Hispanic	-1.004	*	-0.904	*	-0.844		-0.558	
Other Race/Ethnicity	-1.257	*	-1.305	*	-1.232	*	-1.139	*
International Student	-1.537	***	-1.180	***	-1.255	***	-1.073	***
Parent Highest Ed - BA	-0.178		-0.168		-0.127		-0.116	
Parent Highest Ed - MS	-0.159		-0.151		-0.163		-0.041	
Parent Highest Ed - Doc	-0.173		-0.093		-0.074		0.150	
Age in the 30's	0.375		0.523	**	0.527	**	0.527	*
Age in the 40's or higher	0.976	*	1.150	**	1.152	**	1.082	**
Partnered	0.217		0.228		0.265		0.237	
Have Children	-0.068		-0.189		-0.196		-0.157	
Year in Program	0.008		-0.012		-0.012		-0.018	
Stage in Program - Post-quals	-0.091		-0.013		-0.004		0.343	
Stage in Program - Post-proposal	0.190		0.296		0.361		0.468	
Stage in Program - Post-defense	-0.727		-0.580		-0.533		-0.380	
Social Capital								
Have a Mentor/Second Advisor	0.030		0.003		0.017		-0.035	
Other People Integrated with Diss	0.026		0.004		0.013		-0.042	
Student Support Outside Dept	0.026		-0.012		-0.000		0.038	
Involvement in Professional Activities								
Involvement - Teaching/TA req.	-0.124		-0.166		-0.134		-0.157	
Involvement - More Teaching	0.632	***	0.498	**	0.455	*	0.378	
Involvement - Service	-0.117		-0.170		-0.136		0.052	
Involvement - Res. Presentation	-0.188		-0.099		0.005		0.004	
Involvement - More Research	-0.399	*	-0.317		-0.216		-0.070	
Involvement - Internship	-0.297		-0.296		-0.256		-0.160	
Enjoyment of Faculty Tasks								
Enjoyment of Teaching			0.490	***	0.506	***	0.545	***
Enjoyment of Service			0.221	*	0.219	*	0.141	
Enjoyment of Research			-0.732	***	-0.519	***	-0.537	***
Preparation & Confidence								
Prepared - Undergraduate Tasks					0.217		0.079	
Prepared - Graduate Tasks					-0.194		-0.056	
Confident - Undergraduate Tasks					0.029		0.038	
Confident - Graduate Tasks					-1.182	***	-1.175	***

[Appendix 4B.2 continues on the next page]

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Appendix 4B.2 (continued) - Coefficients from Multinomial Regressions of Expectations for Working at Liberal Arts Rather than Doctoral Institutions on Social Support and Individual & Organizational Controls

Measure[a]	Model 5 Involvement Added to 4	Model 6 Enjoyment Added to 5	Model 7 Prep. & Confid. Added to 6	Model 8 Org. Contexts Added to 7
Organizational Factors[b]				
Private Control				-0.117
R&D Expenditures				-0.001
Future Faculty Program (National)				0.295
Future Faculty Program (Local)				-0.280
Percentile rank				-0.008
Total number of grad students				0.004
Student/Faculty Ratio				-0.092
% of Female				-0.002
% of Minorities				-0.002
% of Non US Citizens				-0.034 *
% Research Assistantship				-0.023
% Teaching Assistantship				0.009
Median Years to PhD				0.167
English Department				-1.595
Philosophy Department				-0.859
Art History Department				-1.539
History Department				-1.688
Sociology Department				-1.661 *
Psychology Department				-2.333 **
Chemistry Department				0.927
Mathematics Department				-0.497
Personal Climate				-0.016
Programmatic Climate				0.264
Professional Climate				0.560
Advisor Labor Climate				0.010
Inclusive Faculty Climate				0.418
Unbiased Faculty Climate				-0.556
Faculty Supervising Climate				0.265
Collaborative Faculty Climate				-0.188
Students Not Exploited Climate				0.130
Student Community Climate				0.271
Students Do Not Compete for Faculty				0.353
Faculty Research Climate				1.194
Students Governance Climate				0.030
Coursework Useful Climate				1.978 *
Intercept	1.988	2.022	3.125	-7.414
Pseudo R2	0.091	0.130	0.144	0.187

*p = .05, **p = .01, ***p = .001 (two tailed)
[a] Categorical measures include controls for missing values which are not shown here
[b] Referent category is White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program as appropriate

Chapter 5: The Effect of Gender on Social Support and Professional Self-Concepts

Chapter 3 examined the effect of organizational context on the perception of social support, while Chapter 4 explored how differences in levels of social support affect the development of professional identities and self-concepts. This chapter investigates whether or not there are differences in the perception of social support and differences in socialization outcomes by gender. This approach can help to investigate the possibility that graduate education at least in part reproduces gender inequity.

Social support is conceptualized as accumulated resources, and having capital and resources is connected to socialization and educational outcomes, so if women perceive less social support and thereby accrue fewer resources than men, then women may experience educational inequality in part because of differences in social support. Previous chapters have established that organizational factors can affect the perception of social support, and that social support is an indication of how well social interactions and relationships are providing forms of assistance that can be useful for professional development and socialization. In this chapter, I explore if female graduate students perceive different levels of social support than their male counterparts, and if these differences depend on the type or the source of the social support being provided. Therefore, the first main research question that guides the analysis in this chapter is:

1. *What are the effects of gender on student perceptions of social support?* Previous studies have indicated that women perceive less generalized support from faculty (Fox 2001; Harnett 1981; Hite 1985; Wong & Sanders 1983), and I hypothesize that there will be significant differences in the perceptions of male and female graduate students with regard to social support. However, because this study more

comprehensively specifies the nature of the support and who is providing it, I do not anticipate that women will significantly differ from men on all types of social support.

Chapter 4 established that there are effects of individual social support on students' perspectives of themselves as academic professionals, and this chapter will examine if gender also affects outcomes of professional self-concepts. Analysis will determine if female graduate students perceive themselves as being as prepared and confident to conduct future faculty tasks as men and if female graduate students aspire to and expect to work at bachelor's level institutions rather than doctoral level institutions more or less than men. Thus, the second main research question for this chapter is:

2.   *What are the effects of gender on students' professional self-concepts?* Although not directly related to these particular outcomes, prior research on gender in higher education and research on gender and self-efficacy and/or career aspirations would indicate that we should expect to see gender differences in the professional self-concepts of graduate students. However, because these specific self-concepts are based on various types of tasks and institutions, the effect of gender is likely to have an effect on some of these tasks and institutions more than others. Based on the concept of social comparison in the gender literature, the effect of being female is more likely to be significant and negative in relation to tasks and institutions that are male dominated, namely graduate level tasks that are predominantly conducted at doctoral level institutions.

One reason it is important to determine if gender affects students' professional self concepts is because if structural factors allow women to accumulate less social support, then some of the effects of gender on socialization outcomes may be a result of structural inequality. If there is inequality in the accumulation of social support and the

development of socialization outcomes based on gender, then there are numerous reasons for why this occurs. Identifying the sources of this inequality can help to provide possible solutions for reducing or eliminating at least part of the problem. If the problem is structural, the possible solutions will differ than if the source of the problem is viewed as more broadly cultural or based on differences in how social support is perceived.

In addition to direct effects of gender on specific outcomes, it is possible that women are affected by certain factors differently or that social support affects their training and aspirations differently than men. If men and women possessed equal amounts of social support, but still generate different outcomes, then one group is experiencing what is referred to as capital return deficit (Lin 2000), which is analyzed through the analysis of conditional relationships. The effects of some types of social support on professional self-concepts may be unconditional, but some may differ when they interact with other factors such as gender. Thus, the final research question for this chapter:

3. *Are the effects of social support on professional self-concepts conditional on gender?*

Researchers have had very little success in being able to detect return deficits with regard to social capital in the literature (Lin 2000), but this study investigates the possibility that students do conditionally perceive social support and professional self-concepts based on gender.

Methods

Sample

The two samples used for analysis in the chapter are the same samples used in each of the previous chapters. In analyzing the effect of gender on perceptions of social support the full base sample of 3,023 graduate students was used. The filtered sub-sample of 2,568 graduate students who are considering working as a faculty member at some point in the future is utilized for the analysis pertaining to the effect of gender on professional self-concepts.[1] Both samples have students from all 190 departments representing all 9 selected disciplines at 26 institutions.[2]

Outcome Variables

Outcomes of perceived social support are measured using the same scales that were used in Chapter 3. There are four scales of *advisor support* (personal, program, professional development, and labor expectations), four scales of *faculty support* (inclusive, unbiased, directive, and collaboration), and one scale of *peer support* (student community). Six measures of *professional self-concept* are divided into two broader categories of faculty related tasks and institutional careers. The four faculty task scales refer to both the *type of tasks* (undergraduate level and graduate level) and the extent to which they perceive themselves as either *prepared* or *confident* to perform these tasks. The two measures of *institutional careers* are categorical variables that indicate either the *preference* or *expectation* to work at particular types of higher education institutions. For

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[1] More detailed descriptions of the samples, dependent variables, and control variables can be found in the methods chapter (Chapter 2) or the methods sections of Chapters 3 and 4.

[2] Table 2.2 in Chapter 2 provides a comparison of the two samples.

the purposes this study, the preference or expectation to work at *bachelor's* level

institutions are compared to the preference or expectation to work at *doctoral* level

institutions, with no strong preference and no high expectations as the omitted categories.

Control Variables

The same controls that were used in the previous chapter will also be employed in

the analyses in this chapter. These controls are used to isolate the effect of gender while

holding the potentially influential effects of all other factors constant. *Organizational*

controls include: institutional characteristics, departmental characteristics, discipline, and

departmental climates. Other *individual demographics* are included to control for race,

citizenship, age, relationship and parental status, number of years in the department, and

the stage of program completion. Measures of *social capital* control for whether or not a

student has a second advisor/mentor, the number of other people involved with their

dissertation related research (as in lab situations), and whether or not students have

supportive student communities outside of their department. *Involvement* measures take

into account the fact that some students may have been involved in teaching, research,

service, and internship activities that could also contribute to task preparation and

confidence. Similarly, *enjoyment* measures try to control for any effect that liking or

disliking teaching, service, and research may have on perceptions of preparation and

confidence. Finally, when considering task confidence, task preparation is used as a

control because I am trying to assess the net effects of gender on confidence, and task

confidence is affected by the level of task preparation a student receives. Also, both

preparation and *confidence* are used as controls when analyzing career institutions.

Results

Before controlling for any other factors, women do significantly differ from men in some of their perceptions of social support, and the effect of being female is almost entirely negative. Table 5.1 presents the Pearson correlation matrices for the individual variables and social support outcomes, which will be used in subsequent analysis. Women believe that they receive more personal support and have lower workload expectations from their advisors than men, but there is no significant difference between men and women when it comes to receiving program support or professional development support from their advisors. Women do significantly differ from men with regard to all aspects of faculty support. Women perceive that they receive less direction, collaboration, and inclusive support from faculty and see the faculty as more biased in their provision of support. However, there is no initial difference, between men and women in their perception of peer support. Therefore, there is some indication that women do perceive less social support in graduate school than men, and it is mainly due to the relationships that women have with the general faculty rather than with their advisors.

OLS Regressions of Social Support on Gender

There is an initial impact of gender on the perception of social support, and after controlling for the influence of other factors, most of these effects are reduced yet the effect of gender on several types of support remain significant. Table 5.2 presents coefficients from OLS regression models that pertain to the effect of gender on the nine outcomes of social support. Models 2 through 5 include coefficients for being female

after the inclusion of controls that can potentially alter the original bivariate relationship. Appendices 5A.1 through 5A.9 present all coefficients, including controls, for each model as they pertain to each of the social support outcome measures. Gender does have a significant impact on the perception of social support, but a moderate proportion of these effects can be explained by other factors.

Model 1 in Table 5.2 substantiates the results from the Pearson correlations, demonstrating that there is a significant effect of gender on social support, and being female almost exclusively has a negative impact on the perception of social support. The effect of gender is significant for six of the nine support outcomes, and the only positive effect of gender on social support is that female graduate students believe that they receive more personal support from their advisors than men. The initial significant coefficients for being female are negative for advisor labor expectations, faculty inclusiveness, faculty unbiased support, faculty directiveness, and faculty collaboration. Based on these results and the fact that two measures of advisor support and one measure of peer support are insignificant, not only do women perceive less overall support from their departments than men, but also that this lack of support mainly comes from faculty in general rather than from their advisors and peers.

Although there is a significant initial effect of gender on social support, across all outcomes there is an overall decrease in the effect of being female when other factors are included. Models 2-5 summarize what happens to the effect of being female when controls are added to the equations for each support outcome. The inclusion of other individual characteristics explains a moderate amount of the overall effect of gender on all types of social support (median decrease of 14%), while having additional sources of

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social support account for a slightly smaller amount of this effect (median decrease of

11%). The overall impact of organizational variables on the effect of being female on

social support is fairly negligible (median decrease of 5%), but the inclusion of other

measures of social support account for the largest proportion of the effect of gender on

social support (median decrease of 25%). These results reveal that some of the effect of

being female on perceptions of social support can be attributed to the effect of other

individual and organizational measures; however, looking at overall median changes can

hide some important influences of particular factors on the effect of gender for specific

types of social support.

Examining changes in the effect of gender on specific types of social support can

provide valuable insights as to how specific types of variables may influence the nature

of interactions with advisors, faculty and peers. For example, several patterns exist in

Table 5.2 with regard to the effect of gender on specific forms of social support. The

effect of gender on both advisor personal support and perceptions of faculty being

unbiased is statistically significant in Model 1. In both cases the effect of being female

decreases enough in Models 2-4 with the addition of controls to become statistically

insignificant, meaning that together these factors account for a significantly large amount

of the effect of gender on both these types of support. The effects of other individual

characteristics, other social ties, and organizational factors each contribute a moderate

amount to the effect of gender on advisor personal support (decreases of 22%, 16%, and

17% respectively). Although the influence of individual characteristics on the effect of

gender is similar for unbiased faculty support (-14%), the effects of additional social

capital is considerably smaller (-4%), while the effect of organizational factors is

considerably larger (-40%). However, the effect of being female on advisor personal support and perceptions of faculty bias increases rather than decreases as a result of other forms of support (more than 25% each) and once again becomes significant.

These patterns in the effect of gender on advisor personal support and perceptions of unbiased faculty support can lead to several conclusions, and unfortunately most of them are negative. One important conclusion that can be drawn from these results is that female graduate students perceive more advisor personal support and more faculty bias than male graduate students and the reasons are in part structurally based, meaning that the system of higher education can structurally reproduce gender inequality. Additionally, perceiving faculty members as biased may result in female graduate students avoiding relationships with faculty, resulting in less accumulation of resources from other types of support. Finally, although personally supportive relationships with faculty can bring some emotional benefits, results from Chapter 4 also indicate that increased personal support decreases student perceptions that they are prepared to conduct graduate level tasks, thus putting women at a disadvantage as compared to men.

There is a somewhat similar pattern in the effect of gender on advisor labor expectations and faculty directiveness, except this time, after all controls have been introduced, the effect of gender is no longer significant. The initial effect of gender on both advisor workload expectations and faculty directiveness are both negative, but the addition of controls reduces the effect of gender in each model. The impact of the controls variables on the effect of gender are moderate to large for the perception of advisor labor expectations (decreases of 18%-56%), but are at least half the size in each model with regard to faculty directiveness (decreases of 5%-23%). Unlike the effect of

gender on advisor personal support and unbiased faculty support, the relationship of other forms of support to advisor expectations and faculty bias is responsible for the largest proportion of the effect of gender (56% and 23% respectively). Although the ultimate effect of gender is not significant, organizational factors account for much of the effect of gender, at least with regard to advisor labor expectations (decrease of 18%), once again indicating that structured gender inequality can be created in graduate education.

Gender has a more consistent significant effect on faculty inclusive support than on any other form of social support, meaning that the addition of control variables does very little to change the significant difference between male and female graduate students in their perceptions of being included by the faculty as being a valued part of the department. The impact of individual characteristics, social capital, and organizational context on the effect of gender is relative small (3%, 11%, and -6% respectively). However, other forms of social support exacerbate the effect of gender on faculty inclusiveness (increase of 35%) to make the effect of gender stronger than its original bivariate effect. Once the variability of all other factors has been held constant, the original effect of gender increases by 44% to illustrate that women perceive themselves as being significantly less included as part of the department by the faculty than men do. If women feel less a part of the department, it can cause them to withdraw from pursuing relationships with faculty, thus leading to further deficits in social support and useful capital.

With regard to faculty collaboration, there is an initial negative effect of being female, but because the effect is so strongly based on other factors, the effect is no longer significant once all controls have been included. Other individual characteristics have a

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fairly strong connection to the effect of gender on collaboration (decreases 28%), but the influence of additional measures of social capital are an even larger part of the effect of being female on collaboration (decrease of 61%) that causes the effect to become statistically insignificant. Organizational factors have little to do with the effect of gender on faculty collaboration (increase of 5%). Finally, because the effect of other forms of support has a large impact on the effect of gender (decrease of 86%), the effect of gender on faculty collaboration never regains significance. So, although female graduate students are at a disadvantage to men in their ability to accumulate resources through social support, the willingness of faculty to collaborate with female students on research projects is not directly part of the problem.

There are no differences in the perceptions of advisor program support or professional development support based on gender. Despite some increases in effect size, especially with regard to advisor program support due to the inclusion of controls, the effect of gender never gains significance for either the perception of advisor program support or professional development support. This can be interpreted as very good news, because although women tend to be at a disadvantage to men in their interactions with faculty, there is no difference between women and men with regard to relationships with advisors and their support to help students finish their programs and prepare for their professional careers.

On the other hand, like the effect of gender on advisor program and professional development support, perceptions of peer community support is initially insignificant; however, its effect nearly doubles once all controls have been included in the models. The addition of most controls exacerbates the effect of gender on student community

support (increases of 14%-54%). Only the addition of social capital moderately attenuates the effect of gender on peer support (decrease of 17%). In the end, women perceive significantly more community support from their departmental peers than do men. Although this may appear to be a positive result, it may not be. If female graduate students have more positive relationships with peers than with faculty in general, they are engaging in relationships with people more like themselves (homophily) who although supportive, tend to have fewer resources to offer, thus, possibly reinforcing the capital deficit from their relationships with faculty.

Therefore, after controlling for individual and organizational factors, gender does have a significant effect on almost half of the measures of social support, and, although some of these effects are positive, the overall results of all these significant effects are potentially negative. Female graduate students perceive significantly higher levels of personal support from advisors and community support from peers, but the personal support can be detrimental to some socialization outcomes, and peer support, although positive, does usually lead to less accumulation of capital than with faculty and advisors. Additionally, female graduate students also perceive that faculty members are less inclusive and more unfair in the ways in which they provide support, which can lead to fewer relationships with faculty, and thus, less accumulation of resources. Gender also significantly affects perceptions of advisor labor expectations and faculty directiveness, and the only reason that they do not appear significant in the final model is because of the attenuating effect of other forms of social support. However, this means that the negative effect of being female for these types of support is more indirect through other forms of support. Fortunately there are no differences between men and women in their

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perceptions of social support from advisors and faculty with regard to more informational

and instrumental forms of assistance. There are gender differences in the perception of

social support, but they appear to apply more to aspects of relationships that deal with

emotional aid or the perception of the ways in which support is provided. This suggests

that female graduate students may interact differently with others, or that others may

interact differently with them.

OLS Regressions of Faculty Task Preparation and Confidence on Gender

Gender differences also exist in most of the socialization outcomes that indicate

how prepared and confident students are to conduct certain faculty tasks; however, a

large proportion of these effects are indirect through other factors. Tables 5.3 through 5.6

provide the coefficients for all variables from regressions of faculty task preparation or

confidence on gender. Model 1 provides the bivariate relationships of female with each

task outcome, and Models 2-7 list the coefficients for female and each of the individual

and organizational controls as they are added to the models.[3] In Tables 5.5 and 5.6, one

more model is included to control for task preparation as a means to isolate the effect of

gender on confidence net of the preparation they received to conduct those tasks. There

is significant gender inequity in the development of some dimensions of students'

professional self concept, and large portions of these effects are indirect through social

support.

There is no significant relationship between gender and how well a student

believes that they have been prepared to conduct faculty tasks related to working at the

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[3] Appendix 5B.1 provides a Pearson correlation matrix for the individual variables and professional self-concept outcomes that are used in the remainder of analyses in this chapter.

undergraduate level. Controlling for social support and organizational factors does create

some large changes in the effect of being female (an increase of 28% and a decrease of

79% respectively), but the effect of gender remains statistically insignificant. Thus, male

and female graduate students do not significantly differ in their perceptions that they are

prepared to conduct faculty tasks at the undergraduate level.

Beginning with the initial bivariate relationship in Model 1 of Table 5.4 and

continuing throughout every model, being female decreases students' sense that they are

prepared to conduct research, teaching, and service at the graduate faculty and

professional level. The effect of being female is only slightly affected by the inclusion of

other individual characteristics (decreases by 8%), which is mainly a result of being in

the latter stages of the doctoral program. The addition of social support variables in

Model 3 accounts for a much larger percentage of the effect of gender on graduate

preparation (decreases 32%), which results from the fact that women tend to receive more

personal advisor support that tends to lessen graduate preparation, and perceive less

faculty inclusiveness and fairness that increases graduate preparation. None of the

remaining control variables have a very large influence on the effect of gender, and once

the variability of all other factors has been held constant, gender still retains 80% of it

original effect and has a significant negative effect on perception of preparation to

conduct graduate level faculty tasks. So, women are at a disadvantage to men with

regard to preparation for conducting research and faculty tasks related to working with

graduate students, partially as a result of inequality in social support.

Much like with undergraduate preparation, in Table 5.5 there is no initial

significant effect of gender on the confidence to conduct faculty tasks at the

undergraduate level; however, unlike undergraduate preparation, by the time all controls have been added including controls for preparation, the effect of gender is seven times stronger and women have significantly less confidence than men to perform undergraduate level faculty tasks. Therefore, being a woman is not the direct cause of decreased confidence in undergraduate tasks, but rather the effect of being female on other factors that are significantly related to undergraduate confidence indirectly increases the negative effect of being a woman. Because there are significant differences between men and women with regard to individual characteristics, social support, social capital, and involvement in professional activities, and these factors are significantly related to confidence in undergraduate tasks, the effect of gender is significantly exacerbated when these factors are held constant (increases of 280%, 35%, 13%, and 29% respectively). Conversely, there is no significant difference between men and women in terms of undergraduate task preparation, so the influence of preparation on the effect of gender for undergraduate confidence is virtually non-existent (decreases by 2%). Thus, the fact that women feel significantly less confident than men in their ability to conduct teaching and service tasks at the undergraduate level is due almost entirely to the effect of gender with other factors.

Beginning with the initial bivariate relationship in Model 1 of Table 5.6 and continuing throughout every model, being female significantly decreases students' confidence that they are able to conduct research, teaching, and service at the graduate faculty and professional level. Although individual factors and additional sources of social capital have no influence on the effect of gender on graduate task confidence (each increases by 2%), involvement in professional activities and organizational factors can

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moderately counteract the connection of gender to graduate task confidence (increases of 17% and 14% respectively). Because women receive more personal support from advisors and perceive faculty as less inclusive, social support accounts for a fair proportion of the effect of gender (decreases 13%), as does the fact hat women report enjoying research significantly less than men (decreases 9%). However, the largest influence on the effect of gender on graduate task confidence comes from the effect of graduate task preparation. Because women perceive themselves to be significantly less prepared to conduct graduate tasks, and task preparation accounts for a large percentage of the variation in graduate task confidence (20%), the addition of controls for task preparation accounts for a very large proportion of the effect of gender on graduate task confidence (decreases by 40%). After holding all other effects constant, there is a significant, independent, and negative impact of being female on the confidence to carry out teaching, service, and research tasks at the graduate and professional level, but a large amount of this effect is caused indirectly by social support, both on its own and through its effect on graduate task preparation.

Thus, women are at a distinct disadvantage when it comes to being prepared and confident to perform most teaching, service, and research tasks related to their profession, and women's perception of certain forms of social support plays at least a moderate role in these results. Although women do not perceive themselves as being less prepared to conduct undergraduate tasks, they do see themselves as less prepared to conduct research and graduate level tasks, and are less confident in their ability to conduct both undergraduate and graduate tasks. Although many of these effects are significant even with the inclusion of all controls, other factors do have some influence on these effects,

which provides opportunities for possible reform. However, more immediately relevant to this study is the concern that inequality in some forms of social support that result from interaction with others in their departments can contribute to inequality in some of the socialization goals of graduate education.

Multinomial Regressions of Career Institution Preferences & Expectations on Gender

Gender does have an overall significant effect on the preference and expectations to work at particular types of institutions, with women preferring and expecting to work at bachelor's level institutions more than doctoral level institutions. Tables 5.7 and 5.8 provide the coefficients for all variables from multinomial regressions of career institution preference and confidence on gender. Model 1 provides the bivariate of relationship of female with each career institution outcome, and Models 2-8 list the coefficients for female and each of the individual and organizational controls as they are added to the models. Coefficients indicate the effect of variables on the institutional career preference or expectation to work at bachelor's level institutions as compared to the preference or expectation to work at doctoral level institutions. Different sets of control variables do influence the effect of gender on career institution preferences and expectations, but the overall effect of controls is minor.

Table 5.7 illustrates that regardless of what other controls are included in the statistical models, women are more likely to prefer working at bachelor's level institutions than men. The effect of social support, specific social ties, involvement in professional tasks, and enjoyment of task all have a fairly small impact on the effect of gender on institutional preference (-6%, 2%, 6%, and 3% respectively). Enjoyment does

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account for the largest proportion of explained variance (14%) in the preference of bachelor's institutions over doctoral institutions, but, because women enjoy service significantly more and research significantly less, enjoyment overall has almost no impact on the effect of gender on institutional preference. Individual characteristics account for a moderate amount of the effect of gender (decrease of 15%) because international students are less likely to be women, and there is a very strong negative effect of being an international student on the preference for bachelor's institutions. Also, the effect of gender on the preference for bachelor's institutions is moderately due to preparation and confidence in faculty tasks (decreases by 17%), and specifically because women have significantly less confidence in the ability to conduct graduate level tasks. In the final Model, controls for organizational context have the largest impact on the effect of gender (increase of 36%), but mainly serves to counteract the effects of individual characteristics, social support, task preparation, and task confidence. Therefore, some variables can influence the effect of gender on institutional preference, but overall the effect of gender remains very strong and increases the probability that women prefer to work at bachelor's institutions rather than doctoral universities. This is problematic in that women are already underrepresented in research universities, and it appears that graduate programs do little to change this trend.

Similarly, Table 5.8 demonstrates that with or without controls women expect to work at bachelor's level institutions more than men, and the pattern in the effect of control variables is very similar to those seen with institutional preferences. Again, the effects of international students and being in the latter stages of the program account for a moderate amount of the effect of gender on institutional expectations (decrease of 14%),

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while adding controls for social support, social capital, and enjoyment have little to no impact on the effect of being female (-3%, 1%, and -2% respectively). Although the effect is fairly small (9%), involvement in professional activities can counteract the negative impact of gender on expectations. As with institutional preferences, the strong negative effect of confidence in the ability to conduct graduate level faculty tasks allows preparation and confidence to account for a fairly large proportion of the effect of gender on expectations (decrease of 22%). However, as was seen in the effect of gender on preferences, organizational controls have the single largest influence on the effect of being female (increases 52%), which counteracts the impact of individual characteristics, social support, enjoyment, task preparation, and task confidence. Thus, the effect of gender on institutional expectations is even stronger than the original bivariate effect. Therefore, not only are women more likely to have a preference for working at bachelor's institutions as compared to doctoral level ones, but they are also even more likely to have an expectation of working at bachelor's institutions.

Overall, gender does have a significant impact on institutional preferences and expectations, with women both preferring and expecting to work at bachelor's level institutions rather than doctoral institutions much more than men; however, the direct effect of social support on these outcomes is minor. Because women both prefer and expect to work at bachelor's institutions, then in all likelihood women will probably apply to these types of institutions more, reducing the chances of altering the gender disparity in faculty at research universities. The addition of individual and organizational variables can impact the effect on gender on institutional preferences and expectations,

meaning that these factors can be used as a means for reforms; however, it would require intentional and concerted efforts to change the current status quo.

Return Deficits: Interaction of Female with Measures of Social Support

This chapter has established that gender influences the perception of professional self-concepts with regard to the tasks that students are prepared and confident to conduct as future faculty members, and with regard to the type of institutions within which they prefer and expect to perform these tasks. It was also established in the previous chapter that social support has an effect on these socialization outcomes. It may be possible that these effects of social support are conditional on whether a student is male or female, meaning even if men and women perceive the same amount or quality of social support, the benefit of that support on the outcomes will differ. Thus, I checked for interaction effects by crossing each social support measure with being female into linear interaction terms and entered them into the final models with full controls for each professional self-concept outcome.

Tables 5.9 and 5.10 do reveal that there are a few significant effects of social support that are conditional on gender. Tables 5.9 and 5.10 are summaries of coefficients from OLS & logistic regressions of professional self-concept measures on the interaction of being female with social support measures. The "NS" designations indicate that none of the 11 possible coefficients were statistically significant for that particular outcome. Although there are a few significant conditional effects, because there are very few compared to the number of possible conditional effects of social support for each

outcome, no interpretation should be made about an overall conditional effect of support on gender with regard to these socialization outcomes.

There are a couple of conditional effects of social support on gender in relation to the preparation and confidence to conduct some faculty tasks, but there are only 2 out of a possible 44 effects, so the reliability of these results should be interpreted with caution. Table 5.9 indicates that there are no significant conditional effects of social support on gender with regard to perceptions of preparation or confidence to conduct faculty tasks; however, women do experience return deficits for the effect of certain forms of social support on the preparation and confidence to conduct undergraduate faculty tasks. Even if women perceive the same level of unbiased support from the faculty, they receive less of a return than men in its effect on perceptions of undergraduate task preparation. Similarly, women receive fewer beneficial effects than men for equal perceptions of the lack of competition between peers. So, there is some indication of return deficits for women with regard to the benefit of social support on task preparation and confidence, but the support is very limited.

There is also some indication of conditional effects of social support on gender in relation to institutional preferences and expectations, but, again, the number of actual effects as compared to the possible number of effects is very small (less than 20%). Table 5.10 illustrates that the only significant interaction of social support and gender with regard to institutional preference is that, given the same level of peer community support, women are more likely than men to prefer working at a bachelor's level institution than a doctoral one. This would actually indicate a return benefit rather than a deficit. However, with regard to the expectation to work at a bachelor's level institution

rather than a doctoral university, women experience a return deficit in relation to men. Even if men and women perceive the same levels of advisor labor expectations, faculty collaboration, and student competition for faculty attention, women are still less likely than men to expect to work at bachelor's institutions as opposed to research universities. Thus, there are a few indications of differences in the returns of social support for socialization outcomes based on gender, but, as is the case in studies of the returns of social capital, the results are limited and mixed.

Secondary Analysis – Multilevel Modeling

Because of the nested nature of the data, the use of OLS and standard multinomial logistic regression methods necessitated the disaggregation of organizational level data down to the individual level. As stated in previous chapters, this can result in biased standard errors and potential misinterpretations of significance. I therefore conducted secondary analysis using multilevel modeling techniques as a test of the robustness of the patterns and results that were reported. Overall, the coefficients and standard errors that were produced are nearly identical, and, thus, the basic patterns in relative effect size and direction of influence remained the same. Overall, both analytical techniques produced extremely similar results, and thus no other reinterpretations of the effects of gender on perceptions of social support or the components of graduate students' professional self-concepts are needed.

Conclusions

The previous two chapters established that measures of social support can be applied to the graduate school setting, can be accumulated unequally because of

differences in organizational factors, and that social support can be useful in understanding particular aspects of social interaction and their effects on the outcomes of professional socialization. Analyses in this chapter illustrate that female graduate students can significantly differ from male graduate students in their perceptions of social support. Analyses also indicate that gender has a significant and direct effect on some of the self-concepts that develop in graduate school via the professional socialization process. Thus, there is a reproduction of gender inequality in the system of graduate education that may contribute to the unequal representation of female faculty in higher education institutions. Therefore, unless graduate programs take intentional action to alter the ways in which faculty and students interact in order to accumulate resources through social support, inequality based on gender will continue to be reproduced.

Analyses in this chapter indicate that women do perceive different amounts of some types of social support than men. All else being equal, there are no gender differences in the perception of advisors and faculty providing what is needed in terms of informational and instrumental assistance (advisor – program, advisor – professional development, faculty – directiveness, and faculty collaboration). However, there are gender differences in support based more on emotional aid and the manner of interpersonal interaction and integration (advisor – personal, peer – community, faculty – inclusiveness, and faculty – unbiased). These results indicate that although women are receiving some of the same basic forms of social support, how women interact with the different sources of support may vary. Women may seek out or may be provided with more emotional support from their advisors, and may develop more supportive relationships with peers rather than faculty. Also, if women do perceive faculty as less

inclusive and more biased, then women may interact with faculty members less, which activates less social capital, leading to less acquisition of other forms of capital.

Analyses in this chapter also indicate that women significantly differ from men in terms of most professional self-concept outcomes, and that social support has at least a moderate influence on the effects of gender. Women perceive themselves to be significantly less prepared than men to conduct research and faculty tasks such as teaching and advising graduate students, and are also less confident in their ability to conduct professional tasks at both the graduate and undergraduate levels. Gender differences in advisor personal support, in faculty inclusive and unbiased supports, and in peer support help to account for moderate to large proportions of these gender effects. Women are also more likely to prefer and expect to work at bachelor's level institutions rather than doctoral level universities, but here the effects of social support are more indirect through the sizable impact of lower levels of confidence in graduate level tasks.

It is important to understand that the unequal acquisition of social support, can put female graduate students at a distinct disadvantage in some situations. For example, if being female decreases confidence to perform graduate tasks, and perceptions of more advisor personal support also decrease graduate task confidence, yet women on average perceive higher levels of advisor personal support, then women have two possible barriers to graduate task confidence that men on average do not encounter. Also, if one considers that having higher graduate task confidence makes it much more likely that you will prefer and expect to work at doctoral level institutions rather than bachelor's level ones, then women will more likely apply to and become employed at bachelor's level institutions, resulting in gender inequality in academic careers. At minimum, it makes it

more difficult for women with aspirations for doctoral level careers to acquire the social support, preparation, and confidence that are needed to achieve this goal.

The question then is how to explain the effects of gender on the various types of social support and the various components of professional self-concepts. Social support is developed from social relationships, and, because social relationships are embedded in the social roles and social structures of relationship networks, when studying social support we need to consider roles and structures as well as relationships (Heller et al. 1990). Social support is considered accumulated resources, and according to the literature, inequality in capital can largely result from structural constraints and normative dynamics of social interactions (Lin 2000). Therefore, differences in social support based on gender can result from the fact that: the structure of graduate school affects female graduate students differently; advisors, faculty, or peers interact with or relate to female graduate students differently; and/or female graduate students interact differently than men.

Differences in the acquisition of social support can result from differential opportunities. Differential opportunities refer to when social structures and social institutions unequally provide access to members of different social groups. Chapter 3 indicated that differences in structural factors can lead to differential perceptions of social support, and in this chapter, organizational factors had moderate to large influences on the effect of gender on perceptions of social support. Therefore, the effect of gender on the unequal accumulation of resources from social support is at least in part based on different structurally based opportunities.

Differences in the acquisition of resources through social support can also result from differential investments. Investments can refer to the investments made in members of certain social groups, or investments made by members of the groups themselves. Although it is not possible to directly determine the investments that advisors and faculty make in students, some inferences can be made from the data. For example, women perceive faculty to be less inclusive and more biased. If faculty members are perceived by women as less willing to include some students as a valued part of the department, and less likely to provide equal access or treatment, then it can be inferred that faculty may be making different investments in female graduate students as opposed to men. Also, if women see faculty as less invested in them they may forgo relationships with faculty to pursue other relationships that may be less productive.

It is possible that women are making different investments in some types of social support, meaning that women may seek out some forms of support which men do not. Research on gender differences in social support find that women report receiving more emotional support than men (Cronenwett 1985; Hirsch 1979; Stokes & Wilson 1984; Vaux et al. 1987), and spend more time on supportive interpersonal interactions (Hirsch 1979). The fact that women perceive more social support for their advisors may be either because they seek out more personal support or are perceive by their advisors as needing it. In either case, personal support has been demonstrated to be counterproductive for the achievement of some socialization outcomes, thus its accumulation represents a hindrance rather than a benefit.

Women may also seek support from different sources than men. The research on social networks suggests that men tend to have larger social networks than women, and,

with the exception of family ties, people tend to interact with others that share similar characteristics (Moore 1990). Because men occupy a dominant position in the broader culture, by having smaller networks based on more female ties, women are typically more affiliated with disadvantaged networks that can provide less social capital. Women also make more positive appraisals of support from peers than from family and formal relationships with people such as teachers (Burke & Weir 1978; Cauce et al. 1982). If women perceive faculty as less inclusive and more biased, female students may be investing more into relationships with peers, which would explain the higher perceptions of peer community support. Results from Chapter 4 do indicate positive results of peer community support for being prepared to conduct graduate faculty tasks, but these benefits were typically smaller than the benefits for graduate task preparation from interactions with advisors and faculty.

Although explanations of gender inequality based on socialization are often seen as "blaming the victim" (Browne & England 1997), socialization refers to the reproduction of the predominant social culture, which is accomplished through institutions as well as face to face interaction. But, since social networks are shaped by their social contexts, it is important to consider the larger macro-level social and cultural contexts as well as the more immediate mezzo-level contexts of specific organizations. Returning to a more Durkheimian orientation to network structure and social context provides a more comprehensive framework in order to explain social interaction and social support (Berkman et al. 2000).

Both differential opportunities and differential investments can be explained in terms of the effect of the larger macro-level social-structural conditions in which the

larger social and cultural contexts condition and shape not only the structure of networks, but also the manner in which individuals within those networks typically act (Berkman et al. 2000, Lin 2000). Historically, institutions of higher education were completely male, therefore, graduate schools developed structures, institutional norms, practices, and networks based on a culture that favored masculine forms of interaction. Women will not only accumulate less social support based on structural tendencies, but if there are interactional tendencies based on gender role socialization, women will also pursue interactions that can be less productive in their provision of social support and social capital. Thus, women can be at a disadvantage in graduate school because graduate schools historically operate in a manner that favors more masculine styles of interaction. In terms of reproduction theory, because of previous socialization, men have a strong set of embodied dispositions (habitus) that allows male students to better activate social ties embedded in the social networks of a social institution that were shaped by the dominant male culture. If because of this cultural advantage women tend to perceive less or different types of social support, women are more likely to develop socialization outcomes that encourage women to enter bachelor's level faculty careers rather than doctoral levels ones. As such, the system of graduate education can be seen to operate in order to reproduce and maintain male dominance and male oriented culture.

This broader perspective of gender role socialization can also specifically address why there is such a strong effect of gender on professional socialization outcomes even controlling for other factors. Status characteristics theory (Correll 2001, 2004) can explain how cultural beliefs about gender can differentially act on individuals to bias the self-assessments of men and women. From this perspective, even if women are equally

prepared and competent as men and do not believe that men are more competent than women, even the awareness that these culturally diffuse beliefs exist can lead them to expect that others will treat them according to these beliefs, modify their behavior, and bias the judgments that they make about themselves (Correll 2004; Foschi 1996; Lovaglia et al. 1998; Steele 1997). Therefore, we can explain that being female can have a negative impact on the self-assessments of preparation and confidence controlling for organizational factors, experience, social capital, and social support because women on average hold themselves to a different standard than men, essentially needing to be more prepared and confident in order to actually perceive themselves as being as prepared and confident as men.

From the perspective of status characteristics theory, women are being affected by a stereotype that men are better at research and graduate level teaching and service than women and to some extent better at faculty tasks in general, which would explain why the negative effects of being female are always present and stronger for preparation and confidence for graduate level faculty tasks in particular. Because the basis of this approach is social comparison, we might expect to see stronger or weaker effects based on the gender composition of departments because gender differences become more or less salient. Secondary analysis does indicate that women in high percentage female departments have significantly higher graduate task confidence than women in departments with lower percentages.

Status characteristics theory and learning theory also help to explain the preferences and expectations that women have for working at certain types of institutions. Because people tend to avoid activities that they believe are beyond their skill level and

competence (Bandura 1977, 1982), logically gender differences in task confidence lead to gender differences in the perception and development of career options (Betz & Hackett 1981; Lent et al. 1986) and aspirations (Correll 2001, 2004). Certain types of faculty tasks are seen as more prevalent and necessary for working at particular types of institutions, so, if women perceive themselves as having less preparation and competence to perform graduate-level faculty tasks, they are less likely to aspire to or expect to pursue positions that favor these tasks.

Based on these theoretical perspectives, macro belief structures can influence professional socialization outcomes by constraining perceptions of social support, skill development, competence, and career aspirations. Unfortunately the implication is that if gender differences in these perceptions lead to gender differences in career institution aspirations, men and women will likely make different career choices, which will funnel them into job searches for different types of faculty jobs. This in turn can lead to a reproduction of gender segregation of academic professionals in higher education that reinforces the gender stereotypes that help to create the gender segregation in the first place.

Despite the evidence to support the arguments in this chapter, there are some limitations to these analyses. Although there are initial bivariate effects of being female, it is always possible that some other factors that are not included in the models could account for and attenuate these effects. The only variables that are absent from these models that are typically present in this type of research are controls for actual ability, and measure of prior preparation, confidence, preferences or expectations. Because social support, professional socialization, and the creation of professional self-concepts

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develop and change over time, and, because prior socialization and gender roles are hypothesized to affect current socialization and roles, longitudinal data or some sort of baseline measures would prove helpful. Unfortunately, no such measures are available in these datasets, and although measures of GPAs and GRE scores may provide some measure of "ability", it is unclear what standardized measures could be used to properly gauge the ability to conduct the faculty tasks operationalized in this study or even in the practice of the academic profession. Finally, analyses in this chapter must be understood from the perspective that social support is measured as the perceptions of graduate students and not the actual supportive behavior of departmental members. As such, it cannot be determined if differences in perceptions of social support are because men and women are treated differently by departmental members, because men and women perceive support differently, or because of some combination of the two. These limitations do not negate the above findings, but indicate guidelines for interpretation of these results.

Previous chapters examined organizational differences in the perception of social support, and how differences in levels of social support affect the development of professional identities and self-concepts. This chapter established that based on gender, there are differences in the perception of social support, the development of faculty task preparation and confidence, and the preference and expectation to work at particular types of institutions. Interpreting these results from the perspective of critical theory, I find support for the possibility that graduate education, at least in part, reproduces gender inequity through differences in the accumulation of resources acquired through supportive social interaction and relationships. Theoretical approaches from the study of

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network formation, gender socialization, status characteristics theory, and learning theory

point to possible sources of reform for addressing some of these concerns. These

possibilities will be discussed in the next concluding chapter.

Table 5.1 - Pearson Correlation Matrix of Social Support with Gender & Other Selected Individual Measures

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
Y1	1.00	0.64	0.56	-0.32	0.39	0.18	0.22	0.05	0.14	0.07	0.00	-0.01	0.00	0.06	0.00	-0.06	0.03	0.01	-0.01	-0.01
Y2		1.00	0.66	-0.18	0.43	0.22	0.30	0.10	0.18	0.00	0.01	0.00	-0.02	0.00	-0.02	0.01	0.03	0.00	-0.01	0.00
Y3			1.00	0.02	0.39	0.19	0.32	0.24	0.25	-0.03	-0.03	-0.01	-0.02	0.01	-0.02	0.01	0.01	0.00	-0.01	0.00
Y4				1.00	-0.18	-0.14	0.01	0.27	-0.02	-0.09	-0.02	0.01	-0.01	-0.04	-0.03	0.08	0.04	0.01	-0.01	-0.04
Y5					1.00	0.59	0.51	0.20	0.41	-0.05	-0.03	-0.01	-0.02	0.03	-0.02	0.01	0.00	-0.01	-0.02	0.02
Y6						1.00	0.33	0.20	0.23	-0.07	-0.06	-0.00	-0.03	-0.00	-0.03	0.09	-0.00	-0.02	-0.02	0.04
Y7							1.00	0.23	0.20	-0.05	-0.01	0.02	-0.01	-0.06	-0.01	0.09	0.03	0.01	-0.03	-0.02
Y8								1.00	0.14	-0.06	0.00	0.03	-0.02	-0.04	-0.01	0.06	0.04	0.03	-0.03	-0.05
Y9									1.00	0.03	-0.04	-0.02	0.00	0.10	-0.04	-0.11	-0.07	0.01	0.00	0.05
X10										1.00	0.06	0.03	0.07	0.07	0.00	-0.08	0.02	0.05	0.00	0.02
X11											1.00	-0.03	-0.03	-0.27	-0.03	-0.05	0.05	0.00	0.01	-0.05
X12												1.00	-0.03	-0.28	-0.03	-0.05	-0.03	-0.02	0.02	0.05
X13													1.00	-0.28	-0.03	-0.05	0.06	0.00	-0.04	0.00
X14														1.00	-0.26	-0.50	-0.05	0.06	0.06	0.07
X15															1.00	-0.05	0.00	-0.02	0.03	0.00
X16																1.00	0.08	0.00	-0.02	-0.04
X17																	1.00	-0.26	-0.39	-0.28
X18																		1.00	-0.35	-0.25
X19																			1.00	-0.36
X20																				1.00
X21																				
X22																				
X23																				
X24																				
X25																				
X26																				
X27																				
X28																				
X29																				
X30																				
X31																				
X32																				
X33																				

[Table 5.1 continued on the next page]

Table 5.1 (continued) - Pearson Correlation Matrix of Social Support with Gender & Other Selected Individual Measures

	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30	X31	X32	X33
Y1	-0.04	0.04	0.04	0.06	0.07	0.02	0.04	-0.05	0.01	0.01	0.06	-0.11	0.05
Y2	-0.01	0.02	0.01	0.01	0.00	-0.05	0.03	-0.02	-0.02	0.03	0.02	-0.04	0.01
Y3	0.07	-0.02	-0.08	0.00	-0.03	-0.12	0.01	-0.06	0.02	0.03	0.04	0.14	0.06
Y4	0.14	-0.09	-0.10	-0.08	-0.06	-0.13	0.00	0.10	-0.07	-0.02	-0.05	0.41	-0.03
Y5	0.02	-0.03	0.02	0.03	0.01	-0.08	0.02	-0.04	0.02	0.00	0.04	-0.02	0.02
Y6	0.03	-0.04	0.02	0.03	0.02	-0.11	0.01	-0.01	-0.02	0.02	-0.09	0.04	-0.04
Y7	0.01	-0.02	0.01	-0.01	0.01	-0.05	0.03	0.03	-0.04	0.01	-0.01	0.09	0.01
Y8	0.15	-0.14	-0.03	-0.09	-0.04	-0.17	0.04	0.06	-0.09	0.02	-0.13	0.40	-0.07
Y9	0.15	-0.10	-0.09	-0.01	-0.05	-0.15	0.01	0.00	0.00	0.00	0.06	0.07	0.10
X10	0.01	0.03	0.05	0.07	0.01	0.03	0.09	-0.03	-0.02	-0.02	0.03	-0.09	0.06
X11	-0.02	0.02	0.01	-0.06	0.02	0.01	0.04	0.04	-0.05	-0.01	-0.01	-0.05	0.07
X12	0.08	-0.05	-0.03	-0.02	-0.02	-0.03	-0.01	0.01	0.01	-0.02	0.00	0.03	0.03
X13	-0.01	0.04	-0.02	0.01	-0.01	0.00	0.01	0.00	0.00	-0.01	0.02	-0.04	0.05
X14	0.05	0.05	0.05	0.14	0.03	0.09	-0.01	-0.02	0.02	0.00	0.04	-0.03	-0.03
X15	0.01	0.01	0.00	-0.03	-0.01	0.00	0.03	-0.04	0.02	0.00	0.03	-0.02	0.02
X16	0.02	0.02	-0.04	-0.01	0.00	-0.12	-0.03	0.01	0.01	0.00	-0.09	0.06	-0.05
X17	-0.11	0.04	0.17	0.02	0.06	0.03	0.03	0.03	-0.05	0.02	0.00	0.00	0.00
X18	0.02	0.00	0.04	0.04	0.02	0.00	-0.02	-0.01	0.03	-0.02	0.00	0.02	-0.02
X19	0.05	0.05	-0.08	-0.01	-0.01	0.02	-0.02	-0.03	0.05	-0.02	0.01	-0.04	-0.03
X20	0.11	-0.02	-0.09	0.03	-0.04	-0.05	0.00	0.02	-0.02	0.01	-0.01	0.02	0.05
X21	1.00	-0.74	-0.30	-0.10	-0.24	-0.40	0.03	0.09	-0.04	-0.07	-0.05	0.28	-0.01
X22		1.00	-0.28	0.13	0.13	0.26	-0.04	-0.09	0.06	0.07	0.03	-0.21	0.03
X23			1.00	0.10	0.23	0.26	0.02	-0.03	0.01	0.01	0.03	-0.13	-0.03
X24				1.00	0.33	0.09	-0.03	-0.05	0.04	0.03	0.03	-0.05	-0.05
X25					1.00	0.15	-0.02	-0.01	0.00	0.04	0.03	-0.09	-0.05
X26						1.00	-0.20	-0.19	0.16	0.18	0.02	-0.20	0.02
X27							1.00	-0.16	-0.39	-0.11	0.02	-0.05	-0.02
X28								1.00	-0.60	-0.18	-0.03	0.02	-0.01
X29									1.00	-0.43	0.05	-0.02	0.01
X30										1.00	-0.05	0.04	0.01
X31											1.00	-0.16	0.07
X32												1.00	-0.05
X33													1.00

Legend:

Y1	Advisor Support - Personal
Y2	Advisor Support - Program
Y3	Advisor Support - Professional Development
Y4	Advisor Support - Labor Expectations
Y5	Faculty Support - Inclusive
Y6	Faculty Support - Unbiased
Y7	Faculty Support - Directive
Y8	Faculty Support - Collaboration
Y9	Peer Support - Student Community
X10	Female
X11	African American
X12	Asian American
X13	Hispanic
X14	White
X15	Other Race/Ethnicity
X16	International Student
X17	Parent Highest Ed - HS
X18	Parent Highest Ed - BA
X19	Parent Highest Ed - MS
X20	Parent Highest Ed - Doc
X21	Age in the 20's
X22	Age in the 30's
X23	Age in the 40's or higher
X24	Partnered
X25	Have Children
X26	Year in Program
X27	Stage in Program - Pre-quals
X28	Stage in Program - Post-quals
X29	Stage in Program - Post-proposal
X30	Stage in Program - Post-defense
X31	Have a Mentor/Second Advisor
X32	Number of People Integrated with Diss Research
X33	Part of Supportive Student Community Outside Dept.

Table 5.2 - Summary of Coefficients from OLS Regressions of Social Support Measures on Gender and Selected Departmental Controls

Support Outcome	Model 1 Female No Controls		Model 2 Indiv Demog added to 1		Model 3 Social Capital added to 2		Model 4 Org. Contexts added to 3		Model 5 Social Support added to 4	
Advisor - Personal	0.104	***	0.081	**	0.068	*	0.057		0.077	**
Advisor - Program	-0.002		-0.012		-0.016		-0.022		0.001	
Advisor – Prof. Devel.	-0.039		-0.029		-0.026		-0.036		-0.008	
Advisor - Labor Expect.	-0.134	***	-0.110	***	-0.071	**	-0.058	*	-0.025	
Faculty - Inclusive	-0.050	**	-0.051	*	-0.057	**	-0.053	**	-0.072	***
Faculty – Unbiased	-0.078	***	-0.067	***	-0.064	**	-0.038		-0.049	***
Faculty – Directiveness	-0.061	**	-0.056	*	-0.052	*	-0.049	*	-0.038	
Faculty - Collaboration	-0.085	***	-0.062	*	-0.024		-0.025		-0.004	
Peer - Student Community	0.035		0.046	*	0.039		0.044	*	0.068	***

p = .05, **p = .01, ***p = .001 (two tailed)

Table 5.3 - Coefficients from OLS Regressions of Preparation to Conduct Undergraduate Faculty Tasks on Gender and Individual & Organizational Controls

Measure[a]	Model 1 Female Bivariate	Model 2 Individual Demog.	Model 3 Social Support Added to 2	Model 4 Social Capital Added to 3	Model 5 Involvement Added to 4	Model 6 Enjoyment Added to 5	Model 7 Org. Contexts Added to 6
Female	0.028	0.025	0.032	0.026	0.015	0.019	0.004
African American[b]		0.029	0.063	0.045	0.052	0.055	0.071
Asian American[b]		0.076	0.094	0.079	0.097	0.104	0.109
Hispanic[b]		-0.033	-0.005	-0.023	-0.003	-0.013	-0.002
Other Race/Ethnicity[b]		-0.018	0.007	-0.005	-0.022	-0.016	-0.019
International Student[b]		-0.052	-0.054	-0.047	-0.020	0.001	0.029
Parent Highest Ed - BA[b]		0.024	0.024	0.022	0.013	0.019	0.017
Parent Highest Ed - MS[b]		0.005	0.012	0.011	0.008	0.015	0.014
Parent Highest Ed - Doc[b]		-0.037	-0.039	-0.042	-0.044	-0.037	-0.027
Age in the 30's[b]		0.040	0.038	0.027	0.027	0.028	0.015
Age in the 40's or higher[b]		0.066	0.053	0.040	0.059	0.049	0.024
Partnered[b]		0.030	0.018	0.022	0.024	0.017	0.016
Have Children[b]		0.046	0.043	0.045	0.049	0.046	0.048
Year in Program		-0.001	0.005	0.004	0.001	0.000	-0.000
Stage- Post-quals[b]		0.009	0.022	0.022	0.015	0.009	0.042
Stage - Post-proposal[b]		0.025	0.020	0.023	0.021	0.015	0.062
Stage - Post-defense[b]		0.092 *	0.060	0.066	0.067	0.065	0.110 *
Social Support							
Advisor - Personal			0.020	0.016	0.016	0.009	0.011
Advisor - Program			-0.248 *	-0.211	-0.191	-0.132	-0.135
Prog. Squared			0.055 **	0.050 **	0.047 *	0.036 *	0.036
Advisor – Prof. Dev.			0.047 *	0.042 *	0.035	0.030	0.035
Advisor - Labor			-0.017	-0.008	-0.004	-0.004	0.007
Faculty - Inclusive			0.134 ***	0.122 ***	0.113 ***	0.114 ***	0.104 ***
Faculty - Unbiased			-0.001	0.009	0.019	0.018	0.021
Faculty - Directive			0.066 ***	0.067 ***	0.070 ***	0.072 ***	0.052 **
Faculty - Collaboration			0.191 **	0.194 **	0.180 *	0.195 **	0.210 **
Collab. Squared			-0.049 **	-0.045 **	-0.042 **	-0.044 **	-0.042 **
Faculty - No Exploitation			-0.015	-0.014	-0.017	-0.020	-0.014
Peer - Community			0.058 ***	0.048 **	0.026	0.021	0.036
Peer - No Competition			-0.020	-0.016	-0.013	-0.012	-0.009
Social Capital							
Have a Second Advisor				0.060 **	0.052 **	0.045 *	0.042 *
Others Integrated w/ Diss				-0.008 *	-0.005	-0.006	-0.004
Outside Student Support				0.038 ***	0.032 **	0.027 *	0.033 **
Involvement							
Teaching/TA req.					0.040 *	0.038 *	0.043 *
Additional Teaching					0.149 ***	0.141 ***	0.129 ***
Service					0.060 **	0.050 *	0.044 *
Research Presentation					0.014	0.013	0.000
Additional Research					-0.028	-0.028	-0.021
Internship					0.056	0.061	0.038
Enjoyment							
Teaching						0.066 ***	0.065 ***
Service						0.022	0.019
Research						0.019	0.020 *

[Table 5.3 continued on the next page]

Table 5.3 (continued) - Coefficients from OLS Regressions of Preparation to Conduct Undergraduate Faculty Tasks on Gender and Individual & Organizational Controls

Measure[a]	Model 1 Female Bivariate	Model 2 Individual Demog.	Model 3 Social Support Added to 2	Model 4 Social Capital Added to 3	Model 5 Involvement Added to 4	Model 6 Enjoyment Added to 5	Model 7 Org. Contexts Added to 6
Institutional Characteristics							
Private Control							-0.031
R&D Expenditures							-0.000
Future Faculty Program[b] (National)							0.043
Future Faculty Program[b] (Local)							0.041
Departmental Characteristics							
Percentile rank							-0.001
Total Grad Students							0.000
Student/Faculty Ratio							-0.021 *
% of Female							0.000
% of Minorities							-0.002
% of Non US Citizens							-0.001
% Research Assistantship							0.001
% Teaching Assistantship							0.000
Median Years to PhD							-0.004
Discipline[b]							
English Department							-0.021
Philosophy Department							-0.165
Art History Department							0.028
History Department							-0.055
Sociology Department							0.002
Psychology Department							0.103
Chemistry Department							0.082
Mathematics Department							-0.012
Climates							
Advisor Personal							-0.057
Advisor Programmatic							0.009
Advisor Prof. Dev.							-0.138
Advisor Labor Expect.							-0.105
Inclusive Faculty							-0.042
Unbiased Faculty							-0.061
Faculty Diectiveness							0.215 ***
Collaborative Faculty							-0.099
Students Not Exploited							-0.016
Student Community							-0.051
No Competition for Faculty							-0.000
Faculty Research							0.015
Students Governance							0.108 **
Coursework Useful							-0.155
Intercept	1.958	1.893	1.018	0.937	0.970	0.487	0.986
R2	0.001	0.018	0.121	0.132	0.159	0.176	0.199

*p = .05, **p = .01, ***p = .001 (two tailed)
[a] Not shown but included in the models are variables controlling for missing data in categorical variables.
[b] Referent category is White, First Generation, Twenties, Single, No Children, Pre-Quals, No Future Faculty Development Program, or Geology as appropriate.

Table 5.4 - Coefficients from OLS Regressions of Preparation to Conduct Graduate Faculty Tasks on Gender and Individual & Organizational Controls

Measure[a]	Model 1 Female Bivariate		Model 2 Individual Demog.		Model 3 Social Support Added to 2		Model 4 Social Capital Added to 3		Model 5 Involvement Added to 4		Model 6 Enjoyment Added to 5		Model 7 Org. Contexts Added to 6	
Female	-0.105	***	-0.097	***	-0.066	***	-0.067	***	-0.079	***	-0.073	***	-0.084	***
African American[b]			-0.073		-0.009		-0.011		-0.014		0.002		0.006	
Asian American[b]			-0.036		0.004		-0.004		0.000		0.017		-0.003	
Hispanic[b]			-0.060		-0.006		-0.011		-0.009		-0.030		-0.030	
Other Race/Ethnicity[b]			-0.069		-0.022		-0.029		-0.013		-0.007		-0.004	
International Student[b]			0.034		0.002		0.007		0.026		-0.016		0.007	
Parent Highest Ed - BA[b]			-0.008		0.001		0.002		0.004		0.007		0.002	
Parent Highest Ed - MS[b]			-0.016		0.006		0.009		0.013		0.016		0.012	
Parent Highest Ed - Doc[b]			-0.023		-0.001		-0.000		0.005		-0.003		-0.003	
Age in the 30's[b]			-0.021		0.014		0.018		0.020		0.003		0.008	
Age in the 40's or higher[b]			-0.006		0.039		0.045		0.057		0.025		0.027	
Partnered[b]			0.024		0.029		0.029		0.026		0.024		0.022	
Have Children[b]			0.005		0.007		0.008		0.013		0.021		0.021	
Year in Program			-0.016	***	0.000		0.001		-0.002		0.002		-0.000	
Stage- Post-quals[b]			0.032		0.032		0.026		0.023		0.008		0.013	
Stage - Post-proposal[b]			0.095	**	0.082	**	0.071	*	0.061		0.042		0.050	
Stage - Post-defense[b]			0.230	***	0.177	***	0.166	***	0.145	***	0.116	**	0.126	**
Social Support														
Advisor - Personal					-0.070	***	-0.071	***	-0.070	***	-0.054	***	-0.048	**
Advisor - Program					0.049	*	0.055	**	0.067	***	0.058	**	0.077	***
Advisor – Prof. Devel.					0.211	***	0.204	***	0.185	***	0.158	***	0.140	***
Advisor - Labor Expect					-0.099		-0.100		-0.104		-0.097		-0.098	
Labor Squared					0.036	**	0.034	**	0.033	**	0.032	**	0.032	*
Faculty - Inclusive					0.116	***	0.113	***	0.105	***	0.098	***	0.112	***
Faculty - Unbiased					0.045	*	0.049	*	0.050	*	0.046	*	0.037	
Faculty - Directive					0.051	**	0.048	**	0.046	**	0.046	**	0.038	*
Faculty - Collaboration					0.085	***	0.082	***	0.060	***	0.073	***	0.043	*
Faculty - No Exploitation					-0.009		-0.006		-0.004		-0.005		0.004	
Peer - Community					-0.299	**	-0.310	***	-0.303	**	-0.249	**	-0.258	**
Comm. Squared					0.057	***	0.057	***	0.055	***	0.046	**	0.050	**
Peer - No Competition					-0.016		-0.013		-0.013		-0.011		-0.008	
Social Capital														
Have a Second Advisor							0.044	*	0.037	*	0.029		0.033	
Others Integrated w/ Diss							0.007	*	0.005		0.007	*	-0.003	
Outside Student Support							0.019		0.018		0.019	*	0.021	*
Involvement														
Teaching/TA req.									0.026		0.026		0.013	
Additional Teaching									-0.011		0.003		0.016	
Service									0.003		-0.002		0.002	
Research Presentation									0.063	***	0.049	**	0.023	
Additional Research									0.097	***	0.082	***	0.063	**
Internship									0.092	**	0.093	**	0.070	*
Enjoyment														
Teaching											-0.006		-0.005	
Service											-0.001		-0.005	
Research											0.096	***	0.093	***

[Table 5.4 continued on next page]

Table 5.4 (continued) - Coefficients from OLS Regressions of Preparation to Conduct Graduate Faculty Tasks on Gender and Individual & Organizational Controls

Measure[a]	Model 1 Female Bivariate	Model 2 Individual Demog.	Model 3 Social Support Added to 2	Model 4 Social Capital Added to 3	Model 5 Involvement Added to 4	Model 6 Enjoyment Added to 5	Model 7 Org. Contexts Added to 6
Institutional Characteristics							
Private Control							-0.019
R&D Expenditures							-0.000
Future Faculty Program[b] (National)							-0.010
Future Faculty Program[b] (Local)							0.014
Departmental Characteristics							
Percentile rank							-0.000
Total Grad Students							0.000
Student/Faculty Ratio							-0.010
% of Female							-0.001
% of Minorities							0.002
% of Non US Citizens							-0.001
% Research Assistantship							-0.000
% Teaching Assistantship							-0.001
Median Years to PhD							-0.008
Discipline[b]							
English Department							-0.093
Philosophy Department							-0.203 *
Art History Department							0.025
History Department							-0.079
Sociology Department							-0.056
Psychology Department							0.052
Chemistry Department							0.111
Mathematics Department							-0.138
Climates							
Advisor Personal							-0.072
Advisor Programmatic							-0.000
Advisor Prof. Dev.							0.001
Advisor Labor Expect.							-0.114 *
Inclusive Faculty							-0.034
Unbiased Faculty							-0.008
Faculty Directiveness							1.033 *
Directive Squared							-0.223 *
Collaborative Faculty							0.039
Students Not Exploited							-0.056
Student Community							-0.087
No Competition for Faculty							-0.032
Faculty Research							0.113
Students Governance							0.059
Coursework Useful							-0.184 *
Intercept	2.083	1.350	1.311	1.310	1.352	0.963	0.318
R2	0.012	0.035	0.245	0.250	0.265	0.304	0.329

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Not shown but included in the models are variables controlling for missing data in categorical variables.

[b] Referent category is White, First Generation, Twenties, Single, No Children, Pre-Quals, No Future Faculty Development Program, or Geology as appropriate.

Table 5.5 - Coefficients from OLS Regressions of Confidence to Conduct Undergraduate Faculty Tasks on Gender and Individual & Organizational Controls

Measure[a]	Model 1 Female Bivariate	Model 2 Indiv Demog	Model 3 Social Support Added to 2	Model 4 Social Capital Added to 3	Model 5 Involve. Added to 4	Model 6 Enjoyment Added to 5	Model 7 Org. Contexts Added to 6	Model 8 Preparation Added to 7
Female	-0.006	-0.023	-0.031 *	-0.035 *	-0.045 ***	-0.043 ***	-0.044 ***	-0.043 ***
African American[b]		0.119 **	0.121 **	0.106 *	0.113 **	0.120 **	0.129 ***	0.113 **
Asian American[b]		-0.015	-0.010	-0.024	-0.008	-0.000	-0.008	-0.035
Hispanic[b]		0.059	0.066	0.050	0.066	0.055	0.067	0.067 *
Other Race/Ethnicity[b]		-0.002	0.002	-0.012	-0.021	-0.013	-0.010	-0.009
International Student[b]		-0.204 ***	-0.185 ***	-0.178 ***	-0.152 ***	-0.094 ***	-0.101 ***	-0.107 ***
Parent Ed - BA[b]		0.002	0.002	0.001	-0.003	0.010	0.014	0.011
Parent Ed - MS[b]		-0.037	-0.033	-0.032	-0.033	-0.019	-0.012	-0.015
Parent Ed - Doc[b]		-0.049 *	-0.046 *	-0.047 *	-0.046 *	-0.030	-0.018	-0.011
Age in 30's[b]		0.011	0.012	0.005	0.004	0.009	0.009	0.004
Age in 40's and up[b]		0.036	0.041	0.032	0.047	0.037	0.037	0.028
Partnered[b]		0.036 *	0.033 *	0.038 *	0.038 *	0.023	0.027	0.022
Have Children[b]		-0.005	-0.007	-0.005	-0.002	-0.011	-0.016	-0.028
Year in Program		0.008 *	0.009 *	0.008 *	0.005	0.004	0.004	0.004
Stage- Post-quals[b]		0.026	0.030	0.023	0.018	0.013	0.017	0.006
Stage - Post-proposal[b]		0.051 *	0.045	0.039	0.038	0.028	0.031	0.014
Stage - Post-defense[b]		0.044	0.037	0.032	0.030	0.029	0.027	-0.005
Social Support								
Advisor - Personal			0.031 *	0.028 *	0.029 *	0.010	0.011	0.009
Advisor - Program			0.016	0.024	0.026	0.027	0.019	0.000
Advisor – Prof Dev.			0.029	0.021	0.009	0.006	0.011	-0.002
Advisor - Labor Exp.			-0.003	0.002	0.005	0.002	0.003	-0.001
Faculty - Inclusive			0.000	-0.009	-0.017	-0.015	-0.009	-0.038 *
Faculty - Unbiased			-0.272 ***	-0.264 ***	-0.269 ***	-0.198 **	-0.203 **	-0.205 **
Unbiased Squared			0.046 **	0.046 **	0.049 ***	0.034 *	0.035 *	0.034 **
Faculty - Directive			0.027 *	0.026	0.030 *	0.031 *	0.024	0.011
Faculty - Collab.			-0.025 *	-0.013	-0.019	-0.007	-0.024	-0.031 *
Faculty - No Exploitation			-0.007	-0.005	-0.006	-0.009	-0.007	-0.003
Peer - Community			0.039 **	0.030 *	0.010	0.000	0.011	0.001
Peer - No Competition			0.000	0.004	0.008	0.011	0.012	0.014
Social Capital								
Have a 2nd Advisor				0.060 ***	0.049 ***	0.039 **	0.039 **	0.027 *
Others Integ w/ Diss				-0.004	-0.002	-0.004	-0.008 *	-0.006 *
Outside Stud Support				0.037 ***	0.033 ***	0.023 **	0.024 ***	0.016 *
Involvement								
Teaching/TA req.					0.008	0.005	0.001	-0.011
Additional Teaching					0.083 ***	0.062 ***	0.067 ***	0.035 **
Service					0.068 ***	0.047 ***	0.042 **	0.032 *
Research Presentation					0.040 **	0.042 **	0.032 *	0.032 *
Additional Research					0.017	0.022	0.022	0.024
Internship					0.002	0.010	0.013	0.003
Enjoyment								
Teaching						0.130 ***	0.130 ***	0.114 ***
Service						0.052 ***	0.049 ***	0.044 ***
Research						0.012	0.013	0.005
Preparedness								
Undergraduate Tasks								0.244 ***
Graduate Tasks								0.033

[Table 5.5 continued on the next page]

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Table 5.5 (continued) - Coefficients from OLS Regressions of Confidence to Conduct Undergraduate Faculty Tasks on Gender and Individual & Organizational Controls

Measure[a]	Model 1 Female Bivariate	Model 2 Indiv Demog	Model 3 Social Support Added to 2	Model 4 Social Capital Added to 3	Model 5 Involve. Added to 4	Model 6 Enjoyment Added to 5	Model 7 Org. Contexts Added to 6	Model 8 Preparation Added to 7
Institutional Characteristics								
Private Control							-0.013	-0.005
R&D Expenditures							-0.000	-0.000
Future Faculty Program[b] (National)							-0.029	-0.040 *
Future Faculty Program[b] (Local)							-0.031	-0.042
Departmental Characteristics								
Percentile rank							-0.001	-0.001
Total Grad Students							0.000	0.000
Student/Faculty Ratio							-0.015 *	-0.009
% Female							0.000	0.000
% Minorities							-0.001	-0.001
% Non US Citizens							0.000	0.000
% Research Assistant							0.001	0.001
% Teaching Assistant							0.000	0.000
Median Years to PhD							-0.010	-0.009
Discipline[b]								
English							-0.021	-0.010
Philosophy							-0.059	-0.009
Art History							0.010	0.005
History							-0.061	-0.047
Sociology							0.020	0.026
Psychology							-0.022	-0.051
Chemistry							-0.016	-0.040
Mathematics							-0.101	-0.091
Climates								
Advisor Personal							-0.037	-0.017
Advisor Program							0.088	0.081
Advisor Prof. Dev.							-0.012	0.027
Advisor Labor Expect							-0.063	-0.032
Inclusive Faculty							-0.050	-0.034
Unbiased Faculty							0.012	0.032
Faculty Directiveness							0.084 *	0.031
Collaborative Faculty							0.008	0.029
Students Not Exploited							0.008	0.011
Student Community							-0.066	-0.050
No Competition for Faculty							0.012	0.015
Faculty Research							-0.037	-0.043
Students Governance							-0.017	-0.046 *
Coursework Useful							0.021	0.071
Intercept	2.458	2.285	2.248	2.330	1.555	2.109	1.840	
R2	0.056	0.089	0.107	0.135	0.263	0.279	0.383	

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Not shown but included in the models are variables controlling for missing data in categorical variables.

[b] Referent category is White, First Generation, Twenties, Single, No Children, Pre-Quals, or No Future Faculty Development Program, or Geology as appropriate.

Table 5.6 - Coefficients from OLS Regressions of Confidence to Conduct Graduate Tasks on Gender and Individual & Organizational Controls

Measure[a]	Model 1 Female Bivariate	Model 2 Indiv Demog	Model 3 Social Support Added to 2	Model 4 Social Capital Added to 3	Model 5 Involve. Added to 4	Model 6 Enjoyment Added to 5	Model 7 Org. Contexts Added to 6	Model 8 Preparation Added to 7
Female	-0.102 ***	-0.104 ***	-0.090 ***	-0.092 ***	-0.108 ***	-0.098 ***	-0.112 ***	-0.067 ***
African American[b]		0.006	0.027	0.024	0.021	0.051	0.050	0.057
Asian American[b]		-0.109 *	-0.096	-0.107 *	-0.102 *	-0.071	-0.094 *	-0.075
Hispanic[b]		0.076	0.097 *	0.087	0.088	0.057	0.050	0.069
Other Race/Ethnicity[b]		0.031	0.050	0.039	0.054	0.061	0.056	0.059
International Student[b]		0.008	-0.004	0.004	0.029	-0.017	0.001	0.004
Parent Ed - BA[b]		0.007	0.015	0.014	0.018	0.027	0.026	0.026
Parent Ed - MS[b]		-0.041	-0.028	-0.026	-0.021	-0.013	-0.011	-0.017
Parent Ed - Doc[b]		-0.029	-0.014	-0.012	-0.005	-0.010	-0.004	-0.008
Age in 30's[b]		0.024	0.038	0.037	0.037	0.012	0.005	0.003
Age in 40's and up[b]		0.074 *	0.107 ***	0.105 ***	0.119 ***	0.061 *	0.051	0.038
Partnered[b]		0.034	0.036 *	0.037 *	0.033	0.028	0.026	0.016
Have Children[b]		-0.035	-0.028	-0.028	-0.023	-0.013	-0.019	-0.026
Year in Program		-0.008	-0.001	-0.001	-0.004	0.001	0.000	0.000
Stage - Post-quals[b]		0.070 *	0.071 *	0.060	0.055	0.034	0.046	0.040
Stage - Post-proposal[b]		0.143 ***	0.134 ***	0.120 ***	0.106 ***	0.073 *	0.089 **	0.068 **
Stage - Post-defense[b]		0.217 ***	0.192 ***	0.179 ***	0.152 ***	0.108 **	0.128 ***	0.070 *
Social Support								
Advisor - Personal			-0.056 ***	-0.058 ***	-0.057 ***	-0.036 *	-0.033 *	-0.003
Advisor - Program			0.015	0.022	0.035	0.023	0.039 *	0.003
Advisor - Prof Dev			0.152 ***	0.145 ***	0.121 ***	0.075 ***	0.054 **	-0.020
Advisor - Labor Exp			0.010	0.009	0.001	0.006	0.003	-0.013
Faculty - Inclusive			0.050 *	0.043	0.033	0.018	0.032	-0.019
Faculty - Unbiased			-0.034	-0.026	-0.022	-0.025	-0.026	-0.039 *
Faculty - Directive			0.027	0.025	0.025	0.026	0.016	0.001
Faculty - Collab			0.029 *	0.034 *	0.009	0.033 *	0.002	-0.019
Faculty - No Exploitation			-0.009	-0.006	-0.003	-0.006	0.004	-0.001
Peer - Community			-0.010	-0.017	-0.029	-0.024	-0.012	-0.018
Peer – No Competition			0.000	0.003	0.005	0.010	0.010	0.012
Social Capital								
Have a 2nd Advisor				0.067 ***	0.056 **	0.042 *	0.039 *	0.025
Others Integ w/ Diss				0.002	0.000	0.003	-0.003	-0.002
Outside Stud Support				0.021 *	0.020 *	0.020 *	0.021 *	0.014
Involvement								
Teaching/TA req.					0.025	0.022	0.024	0.019
Additional Teaching					-0.018	-0.001	0.015	0.025
Service					0.026	0.013	0.011	0.015
Research Presentation					0.100 ***	0.076 ***	0.044 *	0.033 *
Additional Research					0.105 ***	0.083 ***	0.069 ***	0.030
Internship					0.068 *	0.070 *	0.042	0.006
Enjoyment								
Teaching						0.028 **	0.027 **	0.039 ***
Service						0.014	0.010	0.016
Research						0.162 ***	0.157 ***	0.107 ***
Preparedness								
Undergraduate Tasks								-0.135 ***
Graduate Tasks								0.568 ***

[Table 5.6 continued on the next page]

Table 5.6 (continued) - Coefficients from OLS Regressions of Confidence to Conduct Graduate Tasks on Gender and Individual & Organizational Controls

Measure[a]	Model 1 Female Bivariate	Model 2 Indiv Demog	Model 3 Social Support Added to 2	Model 4 Social Capital Added to 3	Model 5 Involve. Added to 4	Model 6 Enjoyment Added to 5	Model 7 Org. Contexts Added to 6	Model 8 Preparation Added to 7
Institutional Characteristics								
Private Control							-0.052 *	-0.045 *
R&D Expenditures							-0.000	0.000
Future Faculty Program[b] (National)							-0.030	-0.016
Future Faculty Program[b] (Local)							0.016	0.008
Departmental Characteristics								
Percentile rank							-0.001	-0.001
Total Grad Students							-0.000	-0.000
Student/Faculty Ratio							0.008	0.009
% Female							-0.000	-0.000
% Minorities							0.002	0.001
% Non US Citizens							0.001	0.001
% Research Assistant							-0.000	0.000
% Teaching Assistant							-0.001	-0.000
Median Years to PhD							-0.011	-0.009
Discipline[b]								
English							0.031	0.083
Philosophy							-0.099	-0.018
Art History							0.066	0.058
History							0.015	0.049
Sociology							0.006	0.047
Psychology							0.014	0.008
Chemistry							-0.055	-0.110 *
Mathematics							-0.244 ***	-0.162 **
Climates								
Advisor Personal							-0.059	-0.037
Advisor Program							-0.037	-0.024
Advisor Prof. Dev.							0.099	0.091
Advisor Labor Exp							-0.043	0.006
Inclusive Faculty							-0.095	-0.076
Unbiased Faculty							0.008	0.007
Faculty Directiveness							0.032	0.037
Collaborative Faculty							0.111 **	0.066
Students Not Exploited							-0.003	0.024
Student Community							-0.081	-0.040
Do Not Compete for Faculty							0.033	0.042
Faculty Research							-0.048	-0.109 *
Students Governance							-0.016	-0.035
Coursework Useful							-0.139 *	-0.060
Intercept	2.433	2.346	1.647	1.636	1.725	0.999	2.089	1.712
R2	0.014	0.045	0.108	0.119	0.146	0.266	0.294	0.496

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Not shown but included in the models are variables controlling for missing data in categorical variables.

[b] Referent category is White, First Generation, Twenties, Single, No Children, Pre-Quals, No Future Faculty Development Program, or Geology as appropriate.

Table 5.7 - Coefficients from Multinomial Regressions of Preference for Working at Bachelor's Institutions Rather than Doctoral Institutions on Gender and Selected Individual & Organizational Controls[c]

Measure	Model 1 Female Bivariate		Model 2 Indiv. Demog.		Model 3 Social Support Added to 2		Model 4 Social Capital Added to 3		Model 5 Involve. Added to 4		Model 6 Enjoyment Added to 5		Model 7 Prep. & Confid. Added to 6		Model 8 Org. Contexts Added to 7	
Female	0.552	***	0.467	***	0.439	***	0.447	***	0.472	***	0.487	***	0.402	***	0.547	***
African American[b]			-0.382		-0.467		-0.464		-0.429		-0.664	*	-0.697	*	-0.504	
Asian American[b]			0.207		0.191		0.210		0.243		0.205		0.182		0.263	
Hispanic[b]			-0.347		-0.441		-0.407		-0.370		-0.287		-0.284		-0.070	
Other Race/Ethnicity[b]			-0.399		-0.428		-0.401		-0.525		-0.630		-0.570		-0.382	
International Student[b]			-2.386	***	-2.318	***	-2.344	***	-2.380	***	-1.955	***	-1.953	***	-1.971	***
Parent Ed - BA[b]			-0.098		-0.130		-0.119		-0.163		-0.194		-0.158		-0.140	
Parent Ed - MS[b]			-0.040		-0.052		-0.037		-0.065		-0.062		-0.069		-0.055	
Parent Ed - Doc[b]			-0.069		-0.054		-0.054		-0.080		0.006		-0.000		0.103	
Age in 30's[b]			-0.071		-0.042		0.005		-0.010		0.198		0.215		0.128	
Age in 40's and up[b]			0.045		0.094		0.161		0.166		0.488	*	0.547	*	0.367	
Partnered[b]			0.200		0.213		0.216		0.230	*	0.251	*	0.280	*	0.230	
Have Children[b]			0.067		0.037		0.044		0.042		-0.098		-0.108		-0.051	
Year in Program			0.067	*	0.052		0.055		0.057		0.029		0.033		0.033	
Stage - Post-quals[b]			-0.030		-0.062		-0.084		-0.094		0.038		0.052		0.176	
Stage - Post-proposal[b]			0.100		0.170		0.128		0.156		0.378		0.443		0.360	
Stage - Post-defense[b]			-0.440		-0.356		-0.426		-0.368		-0.093		0.015		0.068	
Social Support																
Advisor - Personal					0.404	***	0.417	***	0.418	***	0.248	*	0.213		0.181	
Advisor - Program					-0.252	*	-0.244		-0.295	*	-0.249		-0.233		-0.112	
Advisor – Prof. Dev.					-0.494	***	-0.510	***	-0.462	***	-0.239		-0.136		-0.213	
Advisor - Labor Exp					0.063		0.017		0.065		0.020		0.038		0.085	
Faculty - Inclusive					-0.355	*	-0.316	*	-0.313		-0.257		-0.191		-0.322	
Faculty - Unbiased					0.061		0.033		0.056		0.058		0.045		0.031	
Faculty - Directive					0.081		0.064		0.085		0.105		0.146		0.151	
Faculty - Collab					-0.027		-0.093		-0.005		-0.083		-0.034		0.264	*
Faculty - No Exploitation					-0.196	*	-0.195	*	-0.214	**	-0.239	**	-0.253	**	-0.245	*
Peer - Community					0.321	**	0.324	**	0.299	**	0.260	*	0.241	*	0.304	*
Peer - No Competition					0.044		0.044		0.053		0.048		0.056		0.043	
Social Capital																
Have a 2nd Advisor							-0.241	*	-0.245	*	-0.252	*	-0.229		-0.314	*
Others Integ w/ Diss							0.043	*	0.059	**	0.044		0.050	*	-0.006	
Outside Stud Support							0.032		0.018		-0.054		-0.029		-0.028	
Involvement																
Teaching/TA req.									-0.035		-0.063		-0.024		-0.041	
Additional Teaching									0.474	***	0.329	*	0.322	*	0.218	
Service									0.096		0.058		0.070		0.168	
Research Presentation									-0.148		-0.012		0.056		-0.002	
Additional Research									-0.507	***	-0.417	**	-0.340	*	-0.134	
Internship									-0.287		-0.329		-0.227		-0.021	
Enjoyment																
Teaching											0.598	***	0.588	***	0.591	***
Service											0.314	***	0.312	***	0.261	***
Research											-1.173	***	-0.985	***	-1.098	***
Future Faculty Tasks																
Prepared - Undergrad													-0.265		-0.368	
Prepared - Graduate													-0.035		-0.005	
Confident - Undergrad													0.626	**	0.682	**
Confident - Graduate													-1.312	***	-1.459	***

[Table 5.7 continued on the next page]

Table 5.7 (continued) - Coefficients from Multinomial Regressions of Preference for Working at Bachelor's Institutions Rather than Doctoral Institutions on Gender and Selected Individual & Organizational Controls[c]

Measure	Model 1 Female Bivariate	Model 2 Indiv. Demog.	Model 3 Social Support Added to 2	Model 4 Social Capital Added to 3	Model 5 Involve. Added to 4	Model 6 Enjoyment Added to 5	Model 7 Prep. & Confid. Added to 6	Model 8 Org. Contexts Added to 7
Institutional Characteristics								
Private Control								0.136
R&D Expenditures								-0.001
Future Faculty Program[b] (National)								0.448 *
Future Faculty Program[b] (Local)								-0.281
Departmental Characteristics								
Percentile rank								-0.007
Total Grad Students								0.007 ***
Student/Faculty Ratio								-0.239 ***
% Female								-0.010
% Minorities								-0.033 *
% Non US Citizens								-0.021 *
% Research Assistant								0.011
% Teaching Assistant								0.015 **
Median Years to PhD								0.124 *
Discipline[b]								
English								-1.375
Philosophy								-0.806
Art History								0.144
History								-0.753
Sociology								-1.638 **
Psychology								-1.375 *
Chemistry								0.554
Mathematics								-2.289 ***
Climates								
Advisor Personal								0.944 *
Advisor Program								-0.320
Advisor Prof. Dev.								0.526
Advisor Labor Exp								-0.786 *
Inclusive Faculty								-1.597 *
Unbiased Faculty								0.250
Faculty Directiveness								0.044
Collaborative Faculty								-0.153
Students Not Exploited								0.393
Student Community								-0.099
Do Not Compete for Faculty								0.163
Faculty Research								0.806
Students Governance								0.328
Coursework Useful								0.949
Intercept	-0.067	-0.237	0.333	0.388	0.269	1.253	1.844	2.679
Pseudo R2	0.012	0.086	0.121	0.128	0.140	0.280	0.298	0.356

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Not shown but included in the models are variables controlling for missing data in categorical variables.

[b] Referent category is White, First Generation, Twenties, Single, No Children, Pre-Quals, No Future Faculty Development Program, or Geology as appropriate.

[c] No Strong Preference and No High Expectations serve as the omitted categories

Table 5.8 - Coefficients from Multinomial Regressions of Expectation for Working at Bachelor's Institutions Rather than Doctoral Institutions on Gender and Selected Individual & Organizational Controls[c]

Measure	Model 1 Female Bivariate		Model 2 Indiv. Demog.		Model 3 Social Support Added to 2		Model 4 Social Capital Added to 3		Model 5 Involve. Added to 4		Model 6 Enjoyment Added to 5		Model 7 Prep. & Confid. Added to 6		Model 8 Org. Contexts Added to 7	
Female	0.592	***	0.508	**	0.492	**	0.495	**	0.536	**	0.527	**	0.412	*	0.625	**
African American[b]			-0.751	*	-0.803	*	-0.817	*	-0.751		-0.912	*	-0.871	*	-0.805	
Asian American[b]			0.272		0.263		0.245		0.298		0.201		0.169		0.235	
Hispanic[b]			-0.980	*	-1.086	*	-1.094	*	-1.004	*	-0.904	*	-0.844		-0.570	
Other Race/Ethnicity[b]			-1.191	*	-1.134	*	-1.132	*	-1.257	*	-1.305	*	-1.232	*	-1.192	*
International Student[b]			-1.644	***	-1.543	***	-1.537	***	-1.537	***	-1.180	***	-1.255	***	-1.062	**
Parent Ed - BA[b]			-0.109		-0.133		-0.130		-0.178		-0.168		-0.127		-0.172	
Parent Ed - MS[b]			-0.112		-0.127		-0.130		-0.159		-0.151		-0.163		-0.092	
Parent Ed - Doc[b]			-0.111		-0.150		-0.153		-0.173		-0.093		-0.074		0.103	
Age in 30's[b]			0.342		0.395	*	0.403	*	0.375		0.523	**	0.527	**	0.528	*
Age in 40's and up[b]			0.923	*	0.974	*	0.986	**	0.976	*	1.150	**	1.152	**	0.965	*
Partnered[b]			0.208		0.203		0.202		0.217		0.228		0.265		0.242	
Have Children[b]			-0.076		-0.065		-0.068		-0.068		-0.189		-0.196		-0.080	
Year in Program			0.011		0.003		0.005		0.008		-0.012		-0.012		-0.009	
Stage - Post-quals[b]			-0.041		-0.075		-0.078		-0.091		-0.013		-0.004		0.396	
Stage - Post-proposal[b]			0.081		0.154		0.145		0.190		0.296		0.361		0.536	
Stage - Post-defense[b]			-0.809	*	-0.773	*	-0.781	*	-0.727		-0.580		-0.533		-0.343	
Social Support																
Advisor - Personal					0.289		0.290		0.277		0.111		0.067		0.075	
Advisor - Program					0.014		0.024		-0.018		0.064		0.101		0.093	
Advisor – Prof. Dev.					-0.684	***	-0.695	***	-0.655	***	-0.482	*	-0.383		-0.476	*
Advisor - Labor Exp					0.172		0.159		0.198		0.165		0.194		0.168	
Faculty - Inclusive					-0.374		-0.361		-0.358		-0.300		-0.258		-0.473	
Faculty - Unbiased					0.409	*	0.406	*	0.429	*	0.403	*	0.367		0.489	*
Faculty - Directive					-0.133		-0.137		-0.126		-0.129		-0.095		-0.176	
Faculty - Collab					-0.244		-0.257		-0.175		-0.197		-0.151		0.109	
Faculty - No Exploitation					-0.371	**	-0.369	**	-0.394	**	-0.411	**	-0.418	**	-0.412	**
Peer - Community					0.478	**	0.472	**	0.457	**	0.393	*	0.365	*	0.436	*
Peer - No Competition					0.164		0.163		0.155		0.168		0.196		0.112	
Social Capital																
Have a 2nd Advisor							0.018		0.030		0.003		0.017		-0.061	
Others Integ w/ Diss							0.014		0.026		0.004		0.013		-0.053	
Outside Stud Support							0.042		0.026		-0.012		-0.000		0.032	
Involvement																
Teaching/TA req.									-0.124		-0.166		-0.134		-0.148	
Additional Teaching									0.632	***	0.498	**	0.455	*	0.380	
Service									-0.117		-0.170		-0.136		0.048	
Research Presentation									-0.188		-0.099		0.005		-0.010	
Additional Research									-0.399	*	-0.317		-0.216		-0.104	
Internship									-0.297		-0.296		-0.256		-0.146	
Enjoyment																
Teaching											0.490	***	0.506	***	0.542	***
Service											0.221	*	0.219	*	0.123	
Research											-0.732	***	-0.519	***	-0.541	***
Future Faculty Tasks																
Prepared - Undergrad													0.217		0.079	
Prepared - Graduate													-0.194		-0.046	
Confident - Undergrad													0.029		0.032	
Confident - Graduate													-1.182	***	-1.208	***

[Table 5.8 continued on the next page]

Table 5.8 (continued) - Coefficients from Multinomial Regressions of Expectation for Working at Bachelor's Institutions Rather than Doctoral Institutions on Gender and Selected Individual & Organizational Controls[c]

Measure	Model 1 Female Bivariate	Model 2 Indiv. Demog.	Model 3 Social Support Added to 2	Model 4 Social Capital Added to 3	Model 5 Involve. Added to 4	Model 6 Enjoyment Added to 5	Model 7 Prep. & Confid. Added to 6	Model 8 Org. Contexts Added to 7
Institutional Characteristics								
Private Control								-0.307
R&D Expenditures								-0.001
Future Faculty Program[b] (National)								0.372
Future Faculty Program[b] (Local)								0.070
Departmental Characteristics								
Percentile rank								-0.005
Total Grad Students								0.006 *
Student/Faculty Ratio								-0.124
% Female								0.007
% Minorities								-0.015
% Non US Citizens								-0.027
% Research Assistant								-0.018
% Teaching Assistant								0.006
Median Years to PhD								0.169
Discipline[b]								
English								-1.179
Philosophy								0.035
Art History								-1.202
History								-1.359
Sociology								-1.324
Psychology								-2.344 **
Chemistry								0.833
Mathematics								-0.157
Climates								
Advisor Personal								-0.223
Advisor Program								-0.014
Advisor Prof. Dev.								0.648
Advisor Labor Exp								0.130
Inclusive Faculty								-32.505 ***
Inclusive Squared								6.239 ***
Unbiased Faculty								-0.833
Faculty Directiveness								0.318
Collaborative Faculty								-5.417 *
Collab. Squared								1.155 *
Students Not Exploited								0.050
Student Community								-0.003
Do Not Compete for Faculty								0.792
Faculty Research								0.789
Students Governance								-0.243
Coursework Useful								1.853 *
Intercept	0.379	0.451	2.177	2.077	1.988	2.022	3.125	44.215
Pseudo R2	0.006	0.048	0.077	0.081	0.091	0.130	0.144	0.193

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Not shown but included in the models are variables controlling for missing data in categorical variables.

[b] Referent category is White, First Generation, Twenties, Single, No Children, Pre-Quals, No Future Faculty Development Program, or Geology as appropriate.

[c] No Strong Preference and No High Expectations serve as the omitted categories

Table 5.9 – Summary of Coefficients from OLS Regressions of Professional Self-Concept Measures on Interactions Involving Gender and Selected Organizational and Individual Factors[a]

		Professional Self-Concept Outcomes			
		Faculty Task Preparation		**Faculty Task Confidence**	
		Undergraduate Level	Graduate Level	Undergraduate Level	Graduate Level
Interactions with Female, Full Controls[b]	Female	.299**		.049	
	Social Support - Type	*faculty unbiased*		*no competition*	
	Social Support - Coefficient	-.070*		-.031*	
	Interaction Term	.088**	NS	.031*	NS

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] First, second, and third coefficients correspond to the female, organizational or individual factor, and interaction term respectively.

[b] Controls include the measures of individual characteristics, social capital, social support, and organizational context.

[c] NS = Not significant at alpha = .05

Table 5.10 – Summary of Coefficients from Multinomial Regressions of Professional Self-Concept Measures on Interactions Involving Gender and Selected Organizational and Individual Factors[a]

		Professional Self-Concept Outcomes			
		Career Institution Preference - Bachelor's vs. Doctorate	Career Institution Expectation - Bachelor's vs. Doctorate		
Interactions with Female, Full Controls[b]	Female	-.711	1.558***	1.891**	2.440***
	Social Support - Type	*peer community*	*labor expectations*	*collaboration*	*no competition*
	Social Support - Coefficient	.061	0.424*	0.381	-0.373*
	Interaction Term	.432*	-0.548*	-0.536*	-0.607*

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] First, second, and third coefficients correspond to the female, organizational or individual factor, and interaction term respectively.

[b] Controls include the measures of individual characteristics, social capital, social support, and organizational context.

[c] NS = Not significant at alpha = .05

Appendix 5A.1 - Coefficients from OLS Regressions of Advisor Personal Support Measures on Gender and Selected Individual & Organizational Controls

Measure[a]	Model 1 Bivariates No Controls		Model 2 Indiv Demog Grouped		Model 3 Social Capital added to 2		Model 4 Org. Contexts added to 3		Model 5 Social Support added to 4	
Female[b]	0.104	***	0.081	**	0.068	*	0.057		0.077	**
African American[b]			-0.033		-0.058		-0.037		-0.040	
Asian American[b]			-0.072		-0.068		-0.043		-0.040	
Hispanic[b]			-0.067		-0.097		-0.090		-0.067	
Other Race/Ethnicity[b]			-0.025		-0.040		-0.043		-0.021	
International Student[b]			-0.172	***	-0.153	**	-0.097		-0.108	*
Parent Highest Ed - BA[b]			-0.035		-0.036		-0.033		-0.032	
Parent Highest Ed - MS[b]			-0.049		-0.058		-0.035		-0.038	
Parent Highest Ed - Doc[b]			-0.044		-0.053		-0.026		-0.049	
Age in the 30's[b]			0.048		0.008		-0.024		-0.011	
Age in the 40's or higher[b]			0.062		0.025		-0.027		-0.059	
Partnered[b]			0.038		0.039		0.026		0.004	
Have Children[b]			0.105	*	0.107	*	0.084	*	0.083	*
Year in Program			-0.007		-0.011		-0.011		-0.001	
Stage in Program - Post-quals[b]			-0.150	**	-0.142	*	-0.101		-0.055	
Stage in Program - Post-proposal[b]			-0.077		-0.067		0.006		-0.001	
Stage in Program - Post-defense[b]			-0.064		-0.034		0.033		0.010	
Advisor Support – Labor Expect.									-0.259	***
Faculty Support – Inclusive									0.539	***
Faculty Support – Unbiased									-0.074	*
Faculty Support – Directive									0.076	**
Faculty Support – Collaboration									0.167	
Collaboration Squared									-0.026	
Faculty Support – No Exploitation									-0.018	
Peer Support – Community									-0.040	
Peer Support – Do Not Compete for Faculty									0.024	
Have a Mentor/Second Advisor					0.052		0.027		0.027	
Others Integrated w/ Dissertation					-0.022	***	-0.002		0.001	
Outside Student Community					0.037	*	0.046	**	0.033	*
Private Control							-0.005		-0.000	
R&D Expenditures							-0.000		-0.000	
Future Faculty Dev Program[b] (National)							0.038		0.039	
Future Faculty Dev Program[b] (Local)							0.129	*	0.123	*
Rank of Effectiveness							-0.002		-0.002	
Total Graduate Students							0.001		0.001	
Student/Faculty Ratio							-0.019		-0.020	
% of Female Students							-0.000		-0.000	
% of Minorities							0.002		0.003	
% of Non US Citizens							0.001		0.001	
% of Research Assistantships							0.002		0.002	
% of Teaching Assistantships							0.001		0.000	
Median Years to PhD							-0.002		-0.005	

[Appendix 5A.1 continued on next page]

Appendix 5A.1 (continued) - Coefficients from OLS Regressions of Advisor Personal Support Measures on Gender and Selected Individual & Organizational Controls

Measure[a]	Model 1 Bivariates No Controls	Model 2 Indiv Demog Grouped	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3		Model 5 Social Support added to 4	
English Department[b]				0.306	*	0.264	*
Philosophy Department[b]				0.215		0.169	
Art History Department[b]				0.171		0.122	
History Department[b]				0.262		0.223	
Sociology Department[b]				0.387	***	0.338	***
Psychology Department[b]				0.349	**	0.315	**
Chemistry Department[b]				0.199	*	0.195	*
Math Department[b]				0.193		0.159	
Climate - Advisor Labor Expect				-0.248	***	-0.006	
Climate - Faculty Inclusiveness				0.373	**	-0.123	
Climate - Faculty Unbiased				-0.297	**	-0.241	**
Climate - Faculty Directiveness				0.106		0.030	
Climate - Faculty Collaboration				0.094		0.021	
Climate - No Exploitation				0.001		0.013	
Climate - Student Community				0.052		0.089	
Climate - Competition for Faculty				-0.068		-0.034	
Climate - Faculty Research				-0.224	*	-0.205	*
Climate - Student Governance				0.064		0.066	
Climate - Coursework Useful				-0.351	**	-0.347	***
Intercept	2.733	2.863	2.843	1.984		1.720	
R^2	0.005	0.020	0.034	0.092		0.277	

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is Male, White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program, or Geology as appropriate

Appendix 5A.2 - Coefficients from OLS Regressions of Advisor Program Support Measures on Gender and Selected Individual & Organizational Controls

Measure[a]	Model 1 Bivariates No Controls	Model 2 Indiv Demog Grouped	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
Female[b]	-0.002	-0.012	-0.016	-0.022	0.001
African American[b]		0.029	0.023	0.046	0.047
Asian American[b]		0.019	0.021	0.047	0.060
Hispanic[b]		-0.097	-0.107	-0.093	-0.085
Other Race/Ethnicity[b]		-0.081	-0.087	-0.085	-0.060
International Student[b]		0.004	0.011	0.050	0.031
Parent Highest Ed - BA[b]		-0.036	-0.037	-0.037	-0.041
Parent Highest Ed - MS[b]		-0.037	-0.041	-0.024	-0.024
Parent Highest Ed - Doc[b]		-0.025	-0.027	-0.011	-0.021
Age in the 30's[b]		0.058 *	0.043	0.002	0.015
Age in the 40's or higher[b]		0.068	0.054	-0.003	-0.023
Partnered[b]		0.012	0.012	0.010	0.002
Have Children[b]		-0.012	-0.013	-0.033	-0.035
Year in Program		-0.024 ***	-0.026 ***	-0.028 ***	-0.017 **
Stage in Program - Post-quals[b]		-0.074	-0.074	-0.033	0.005
Stage in Program - Post-proposal[b]		-0.032	-0.031	0.056	0.067
Stage in Program - Post-defense[b]		0.045	0.054	0.134 *	0.131 **
Advisor Support - Labor Expect					-0.096 ***
Faculty Support - Inclusive					0.421 ***
Faculty Support - Unbiased					-0.394 ***
Unbiased Squared					0.086 ***
Faculty Support - Directive					0.128 ***
Faculty Support - Collaboration					0.069 ***
Faculty Support - No Exploitation					-0.025
Peer Support - Community					0.019
Peer Support - Do Not Compete for Faculty					0.054 ***
Have a Mentor/Second Advisor			0.022	0.005	-0.005
# People Integrated in Diss			-0.009 *	0.016 **	0.013 **
Student Community Outside Dept.			0.006	0.015	-0.000
Private Control				-0.104 **	-0.096 **
R&D Expenditures				-0.000	-0.000
Future Faculty Dev Program[b] (National)				-0.014	-0.016
Future Faculty Dev Program[b] (Local)				0.038	0.028
Rank of Effectiveness				-0.002	-0.002
Total Graduate Students				0.000	0.000
Student/Faculty Ratio				-0.005	-0.007
% of Female Students				0.002	0.002
% of Minorities				-0.002	-0.001
% of Non US Citizens				0.002	0.002
% of Research Assistantships				-0.000	-0.001
% of Teaching Assistantships				-0.000	-0.000
Median Years to PhD				-0.000	-0.003

[Appendix 5A.2 continued on next page]

Appendix 5A.2 (continued) - Coefficients from OLS Regressions of Advisor Program Support Measures on Gender and Selected Individual & Organizational Controls

Measure[a]	Model 1 Bivariates No Controls	Model 2 Indiv Demog Grouped	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
English Department[b]				0.280 *	0.263 *
Philosophy Department[b]				0.280 *	0.257 *
Art History Department[b]				0.075	0.031
History Department[b]				0.225 *	0.203 *
Sociology Department[b]				0.354 ***	0.321 ***
Psychology Department[b]				0.202	0.188 *
Chemistry Department[b]				0.056	0.081
Math Department[b]				0.291 **	0.278 **
Climate - Advisor Labor Expect				-0.013	0.092
Climate - Faculty Inclusiveness				0.309 **	-0.098
Climate - Faculty Unbiased				-0.177 *	-0.167 *
Climate - Faculty Directiveness				0.164 *	0.047
Climate - Faculty Collaboration				0.022	-0.063
Climate - No Exploitation				-0.033	-0.011
Climate - Student Community				-0.060	-0.076
Climate - No Competition for Faculty				0.091	0.032
Climate - Faculty Research				-0.007	-0.002
Climate - Student Governance				0.020	0.026
Climate - Coursework Useful				-0.464 ***	-0.476 ***
Intercept	3.006	3.176	3.187	2.271	2.648
R^2	0.000	0.013	0.016	0.086	0.273

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is Male, White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program, or Geology as appropriate

Appendix 5A.3 - Coefficients from OLS Regressions of Advisor Professional Development Support on Gender and Selected Individual & Organizational Controls

Measure[a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
Female[b]	-0.039	-0.029	-0.026	-0.036	-0.008
African American[b]		-0.114	-0.112	-0.083	-0.079
Asian American[b]		-0.075	-0.089	-0.104	-0.071
Hispanic[b]		-0.080	-0.077	-0.077	-0.075
Other Race/Ethnicity[b]		-0.114	-0.119	-0.095	-0.056
International Student[b]		-0.031	-0.022	0.002	-0.010
Parent Highest Ed - BA[b]		-0.043	-0.038	-0.032	-0.040
Parent Highest Ed - MS[b]		-0.051	-0.038	-0.018	-0.023
Parent Highest Ed - Doc[b]		-0.050	-0.045	-0.025	-0.027
Age in the 30's[b]		-0.030	0.002	-0.010	0.001
Age in the 40's or higher[b]		-0.148 **	-0.103 *	-0.132 **	-0.150 ***
Partnered[b]		0.018	0.022	0.020	0.015
Have Children[b]		-0.002	0.003	-0.012	-0.009
Year in Program		-0.040 ***	-0.036 ***	-0.035 ***	-0.024 ***
Stage in Program - Post-quals[b]		-0.085	-0.101 *	-0.066	-0.030
Stage in Program - Post-proposal[b]		0.056	0.034	0.088	0.111 **
Stage in Program - Post-defense[b]		0.141 *	0.104	0.152 **	0.172 ***
Advisor Support - Labor Expect					0.191 **
Labor Squared					-0.046 **
Faculty Support - Inclusive					0.399 ***
Faculty Support - Unbiased					-0.067 *
Faculty Support - Directive					0.139 ***
Faculty Support - Collaboration					0.136 ***
Faculty Support - No Exploitation					-0.027
Peer Support - Community					0.078 ***
Peer Support - Do Not Compete for Faculty					0.011
Have a Mentor/Second Advisor			0.074 **	0.070 **	0.046 *
# of People Integrated in Diss			0.024 ***	0.026 ***	0.018 ***
Student Community Outside Dept.			0.054 ***	0.060 ***	0.038 **
Private Control				-0.060	-0.049
R&D Expenditures				0.000	0.000
Future Faculty Dev Program[b] (National)				-0.023	-0.024
Future Faculty Dev Program[b] (Local)				0.063	0.053
Rank of Effectiveness				0.000	-0.000
Total Graduate Students				-0.000	-0.000
Student/Faculty Ratio				0.005	0.004
% of Female Students				0.000	0.000
% of Minorities				-0.003	-0.003
% of Non US Citizens				0.001	0.001
% of Research Assistantships				-0.000	-0.000
% of Teaching Assistantships				-0.000	-0.000
Median Years to PhD				-0.001	-0.003

[Appendix 5A.3 continued on next page]

Appendix 5A.3 (continued) - Coefficients from OLS Regressions of Advisor Professional Development Support on Gender and Selected Individual & Organizational Controls

Measure[a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
English Department[b]				-0.153	-0.153
Philosophy Department[b]				-0.231 *	-0.245 *
Art History Department[b]				-0.012	-0.038
History Department[b]				-0.002	-0.006
Sociology Department[b]				-0.004	-0.024
Psychology Department[b]				0.069	0.079
Chemistry Department[b]				-0.068	-0.020
Math Department[b]				-0.067	-0.082
Climate - Advisor Labor Expect				-0.041	-0.032
Climate - Faculty Inclusiveness				0.306 **	-0.066
Climate - Faculty Unbiased				-0.182 *	-0.144
Climate - Faculty Directiveness				0.237 **	0.100
Climate - Faculty Collaboration				0.038	-0.107
Climate - No Exploitation				-0.115	-0.092
Climate - Student Community				0.028	-0.050
Climate - No Competition for Faculty				0.059	0.033
Climate - Faculty Research				-0.066	-0.055
Climate - Student Governance				0.019	0.029
Climate - Coursework Useful				-0.416 ***	-0.420 ***
Intercept	2.637	2.904	2.663	1.453	1.066
R^2	0.001	0.033	0.053	0.109	0.266

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is Male, White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program, or Geology as appropriate

Appendix 5A.4 - Coefficients from OLS Regressions of Advisor Labor Expectations on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
Female [b]	-0.134 ***	-0.110 ***	-0.071 **	-0.058 *	-0.025
African American [b]		-0.093	-0.018	-0.015	-0.028
Asian American [b]		0.031	0.002	-0.055	-0.020
Hispanic [b]		-0.032	0.043	0.068	0.033
Other Race/Ethnicity [b]		-0.133	-0.111	-0.070	-0.066
International Student [b]		0.157 **	0.130 **	0.089	0.057
Parent Highest Ed - BA [b]		-0.049	-0.038	-0.028	-0.030
Parent Highest Ed - MS [b]		-0.094 *	-0.051	-0.017	-0.028
Parent Highest Ed - Doc [b]		-0.165 ***	-0.131 ***	-0.082 *	-0.065
Age in the 30's [b]		-0.162 ***	-0.014	0.045	0.036
Age in the 40's or higher [b]		-0.284 ***	-0.116 *	-0.044	-0.008
Partnered [b]		-0.082 **	-0.080 **	-0.058 *	-0.048
Have Children [b]		-0.001	0.004	-0.014	0.029
Year in Program		-0.015 *	0.002	0.007	0.005
Stage in Program - Post-quals [b]		0.101	0.053	0.057	0.028
Stage in Program - Post-proposal [b]		-0.044	-0.112 *	-0.112 *	-0.128 **
Stage in Program - Post-defense [b]		-0.014	-0.147 *	-0.171 **	-0.189 ***
Advisor Support - Personal					-0.304 ***
Advisor Support - Program					-0.067 *
Advisor Support - Professional Dev					0.224 ***
Faculty Support - Inclusive					-0.012
Faculty Support - Unbiased					0.441 ***
Unbiased Squared					-0.069 **
Faculty Support - Directive					0.044
Faculty Support - Collaboration					0.008
Faculty Support - No Exploitation					-0.184 ***
Peer Support - Community					0.282 *
Community Squared					-0.051 *
Peer Support - Do Not Compete for Faculty					-0.029
Have a Mentor/Second Advisor			0.042	0.078 **	0.051 *
# of People Integrated in Diss			0.094 ***	0.044 ***	0.034 ***
Student Community Outside Dept.			-0.009	0.002	-0.002
Private Control				0.067	0.071
R&D Expenditures				-0.000	-0.000
Future Faculty Dev Program [b] (National)				0.002	0.001
Future Faculty Dev Program [b] (Local)				0.016	0.010
Rank of Effectiveness				0.001	0.001
Total Graduate Students				0.000	0.000
Student/Faculty Ratio				-0.041 **	-0.040 **
% of Female Students				-0.001	-0.001
% of Minorities				0.002	0.002
% of Non US Citizens				-0.002	-0.002
% of Research Assistantships				0.001	0.001
% of Teaching Assistantships				0.001	0.001
Median Years to PhD				0.007	0.008

[Appendix 5A.4 continued on next page]

Appendix 5A.4 (continued) - Coefficients from OLS Regressions of Advisor Labor Expectations on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
English Department [b]				-0.500 ***	-0.529 ***
Philosophy Department [b]				-0.405 **	-0.430 ***
Art History Department [b]				-0.191	-0.229
History Department [b]				-0.324 **	-0.364 **
Sociology Department [b]				-0.287 *	-0.316 **
Psychology Department [b]				-0.036	-0.059
Chemistry Department [b]				0.176 *	0.212 **
Math Department [b]				-0.227	-0.235 *
Climate - Advisor Personal				-0.298 ***	0.003
Climate - Advisor Program				0.175	0.251 *
Climate - Advisor Professional				-0.026	-0.242 *
Climate - Faculty Inclusiveness				0.161	0.152
Climate - Faculty Unbiased				-0.121	-0.030
Climate - Faculty Directiveness				0.010	-0.031
Climate - Faculty Collaboration				0.023	0.020
Climate - No Exploitation				-0.259 ***	-0.063
Climate - Student Community				0.014	0.026
Climate - No Competition for Faculty				-0.004	0.018
Climate - Faculty Research				0.018	0.035
Climate - Student Governance				0.005	0.009
Climate - Coursework Useful				0.031	0.037
Intercept	1.823	2.123	1.768	0.696	-0.135
R^2	0.007	0.054	0.190	0.271	0.394

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is Male, White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program, or Geology as appropriate

Appendix 5A.5 - Coefficients from OLS Regressions of Faculty Inclusive Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
Female [b]	-0.050 **	-0.051 *	-0.057 **	-0.053 **	-0.072 ***
African American [b]		-0.083	-0.094	-0.031	0.000
Asian American [b]		-0.027	-0.028	-0.028	-0.015
Hispanic [b]		-0.078	-0.088	-0.084	-0.038
Other Race/Ethnicity [b]		-0.087	-0.093	-0.060	-0.020
International Student [b]		-0.017	-0.008	0.016	0.080 **
Parent Highest Ed - BA [b]		-0.007	-0.007	-0.004	-0.014
Parent Highest Ed - MS [b]		-0.006	-0.008	-0.004	-0.011
Parent Highest Ed - Doc [b]		0.026	0.022	0.025	0.003
Age in the 30's [b]		0.004	-0.009	-0.019	0.003
Age in the 40's or higher [b]		0.078 *	0.064	0.030	0.038
Partnered [b]		0.032	0.031	0.024	0.020
Have Children [b]		0.007	0.007	0.003	-0.009
Year in Program		-0.026 ***	-0.027 ***	-0.019 ***	-0.003
Stage in Program - Post-quals [b]		-0.071	-0.065	-0.060	-0.021
Stage in Program - Post-proposal [b]		0.000	0.007	-0.007	-0.009
Stage in Program - Post-defense [b]		0.016	0.030	0.008	-0.014
Advisor Support - Personal					0.090 ***
Advisor Support - Program					0.116 ***
Advisor Support - Professional Dev					0.055 ***
Advisor Support - Labor Expect					-0.010
Faculty Support - Collaboration					0.140 ***
Faculty Support - No Exploitation					0.169 ***
Peer Support - Community					0.207 ***
Peer Support - Do Not Compete for Faculty					0.083 ***
Have a Mentor/Second Advisor			0.037	0.036	0.030 *
# of People Integrated in Diss			-0.007 *	0.004	-0.000
Student Community Outside Dept.			0.016	0.025 *	0.003
Private Control				-0.024	-0.011
R&D Expenditures				-0.000	-0.000
Future Faculty Dev Program [b] (National)				-0.008	-0.009
Future Faculty Dev Program [b] (Local)				-0.018	-0.026
Rank of Effectiveness				-0.001	-0.001
Total Graduate Students				0.000	0.000
Student/Faculty Ratio				-0.013	-0.015 *
% of Female Students				0.002	0.002
% of Minorities				-0.001	-0.001
% of Non US Citizens				-0.000	-0.001
% of Research Assistantships				0.001	0.001
% of Teaching Assistantships				0.001	0.001
Median Years to PhD				0.020 *	0.019 **

[Appendix 5A.5 continued on next page]

Appendix 5A.5 (continued) - Coefficients from OLS Regressions of Faculty Inclusive Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
English Department [b]				-0.011	0.006
Philosophy Department [b]				-0.022	-0.015
Art History Department [b]				-0.007	0.003
History Department [b]				0.080	0.095
Sociology Department [b]				-0.159	-0.162 *
Psychology Department [b]				-0.079	-0.056
Chemistry Department [b]				-0.078	-0.037
Math Department [b]				-0.012	-0.000
Climate - Advisor Personal				0.070	-0.019
Climate - Advisor Program				0.038	-0.072
Climate - Advisor Professional				0.142	0.096
Climate - Advisor Labor Expectations				0.011	0.027
Climate - Faculty Collaboration				0.169 ***	0.029
Climate - Student No Exploitation				0.289 ***	0.119 ***
Climate - Student Community				0.113 *	-0.090 *
Climate - No Competition for Faculty				0.056	-0.021
Climate - Faculty Research				0.052	0.052
Climate - Student Governance				0.114 ***	0.113 ***
Climate - Coursework Useful				-0.023	-0.015
Intercept	2.672	2.818	2.786	1.499	1.367
R^2	0.002	0.021	0.025	0.153	0.484

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is Male, White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program, or Geology as appropriate

Appendix 5A.6 - Coefficients from OLS Regressions of Unbiased Faculty Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
Female [b]	-0.078 ***	-0.067 **	-0.064 **	-0.038	-0.049 **
African American [b]		-0.196 **	-0.195 **	-0.152 *	-0.128 *
Asian American [b]		-0.007	-0.010	-0.042	-0.068
Hispanic [b]		-0.088	-0.081	-0.064	-0.028
Other Race/Ethnicity [b]		-0.118	-0.106	-0.079	-0.077
International Student [b]		0.127 ***	0.110 **	0.085 *	0.089 **
Parent Highest Ed - BA [b]		-0.021	-0.020	-0.028	-0.041
Parent Highest Ed - MS [b]		-0.001	-0.002	-0.005	-0.006
Parent Highest Ed - Doc [b]		0.045	0.045	0.041	0.021
Age in the 30's [b]		-0.003	0.001	0.027	0.027
Age in the 40's or higher [b]		0.089 *	0.087 *	0.096 *	0.059
Partnered [b]		0.025	0.024	0.030	0.023
Have Children [b]		0.037	0.038	0.036	0.027
Year in Program		-0.033 ***	-0.034 ***	-0.024 ***	-0.014 **
Stage in Program - Post-quals [b]		-0.037	-0.033	-0.063	-0.036
Stage in Program - Post-proposal [b]		0.001	0.008	-0.039	-0.030
Stage in Program - Post-defense [b]		0.071	0.071	-0.005	-0.004
Advisor Support - Personal					0.015
Advisor Support - Program					-0.116
Program Squared					0.030
Advisor Support - Professional Dev					-0.014
Advisor Support - Labor Expect					-0.058 ***
Faculty Support - Directive					0.152 ***
Faculty Support - Collaboration					0.101 ***
Faculty Support - No Exploitation					0.192 ***
Peer Support - Community					0.387 ***
Community Squared					-0.058 ***
Peer Support – Do Not Compete for Faculty					0.129 ***
Have a Mentor/Second Advisor			-0.090 ***	-0.066 **	-0.047 *
# of People Integrated in Diss			-0.001	-0.005	-0.004
Student Community Outside Dept.			-0.015	-0.005	-0.014
Private Control				0.051	0.066 *
R&D Expenditures				-0.000	-0.000
Future Faculty Dev Program [b] (National)				0.007	0.011
Future Faculty Dev Program [b] (Local)				0.034	0.033
Rank of Effectiveness				-0.001	-0.001
Total Graduate Students				0.001 ***	0.001 ***
Student/Faculty Ratio				-0.046 ***	-0.048 ***
% of Female Students				0.003 *	0.003 **
% of Minorities				-0.006 **	-0.007 **
% of Non US Citizens				0.000	0.000
% of Research Assistantships				0.003 *	0.003 *
% of Teaching Assistantships				0.001	0.001
Median Years to PhD				0.013	0.015

[Appendix 5A.6 continued on next page]

Appendix 5A.6 (continued) - Coefficients from OLS Regressions of Faculty Biased Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
English Department[b]				-0.235 *	-0.253 **
Philosophy Department[b]				-0.066	-0.072
Art History Department[b]				-0.181	-0.203 *
History Department[b]				-0.059	-0.077
Sociology Department[b]				-0.143	-0.164 *
Psychology Department[b]				0.072	0.068
Chemistry Department[b]				0.154 *	0.163 **
Math Department[b]				0.047	0.049
Climate - Advisor Personal				-0.089	-0.088
Climate - Advisor Program				-0.019	-0.090
Climate - Advisor Professional				-0.077	-0.059
Climate - Advisor Labor Expectations				-0.084	-0.021
Climate - Faculty Directiveness				0.214 ***	0.086
Climate - Faculty Collaboration				0.047	-0.054
Climate - No Exploitation				0.332 ***	0.143 ***
Climate - Student Community				-0.011	-0.066
Climate - No Competition for Faculty				0.064	-0.073
Climate - Faculty Research				0.067	0.072
Climate - Student Governance				0.089 *	0.090 **
Climate - Coursework Useful				-0.292 ***	-0.325 ***
Intercept	2.396	2.237	2.154	1.378	1.754
R^2	0.005	0.035	0.045	0.160	0.387

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is Male, White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program, or Geology as appropriate

Appendix 5A.7 - Coefficients from OLS Regressions of Faculty Directive Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
Female[b]	-0.061 **	-0.056 *	-0.052 *	-0.049 *	-0.038
African American[b]		-0.034	-0.025	0.050	0.084
Asian American[b]		0.095	0.089	0.090	0.096
Hispanic[b]		-0.006	-0.001	0.000	0.037
Other Race/Ethnicity[b]		-0.021	-0.020	0.020	0.079
International Student[b]		0.176 ***	0.175 ***	0.180 ***	0.180 ***
Parent Highest Ed - BA[b]		-0.006	-0.005	0.005	0.012
Parent Highest Ed - MS[b]		-0.043	-0.035	-0.007	-0.006
Parent Highest Ed - Doc[b]		-0.052	-0.048	-0.021	-0.035
Age in the 30's[b]		-0.009	0.014	0.022	0.023
Age in the 40's or higher[b]		0.027	0.058	0.050	0.049
Partnered[b]		-0.006	-0.003	-0.009	-0.012
Have Children[b]		0.018	0.020	0.002	-0.007
Year in Program		-0.008	-0.005	-0.004	0.012 *
Stage in Program - Post-quals[b]		-0.036	-0.052	-0.019	0.004
Stage in Program - Post-proposal[b]		-0.079	-0.098 *	-0.062	-0.061
Stage in Program - Post-defense[b]		-0.040	-0.070	-0.045	-0.070
Advisor Support - Personal					0.019
Advisor Support - Program					0.127 ***
Advisor Support - Professional Dev					0.092 ***
Advisor Support - Labor Expect					0.031
Faculty Support - Unbiased					0.215 ***
Faculty Support - Collaboration					0.084 ***
Faculty Support - No Exploitation					0.051 ***
Peer Support - Community					0.076 ***
Peer Support - Do Not Compete for Faculty					0.027
Have a Mentor/Second Advisor			0.008	0.014	0.013
# of People Integrated in Diss			0.016 ***	0.011 *	0.005
Student Community Outside Dept.			0.018	0.026 *	0.017
Private Control				-0.063	-0.059
R&D Expenditures				-0.000	-0.000
Future Faculty Dev Program[b] (National)				-0.015	-0.015
Future Faculty Dev Program[b] (Local)				-0.017	-0.024
Rank of Effectiveness				-0.001	-0.001
Total Graduate Students				-0.001	-0.001 *
Student/Faculty Ratio				0.037 **	0.035 ***
% of Female Students				-0.002	-0.002
% of Minorities				0.003	0.003
% of Non US Citizens				0.001	0.001
% of Research Assistantships				-0.002	-0.002
% of Teaching Assistantships				0.000	0.000
Median Years to PhD				0.017	0.017

[Appendix 5A.7 continued on next page]

Appendix 5A.7 (continued) - Coefficients from OLS Regressions of Faculty Directive Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
English Department[b]				0.069	0.073
Philosophy Department[b]				-0.015	-0.018
Art History Department[b]				0.112	0.109
History Department[b]				0.131	0.126
Sociology Department[b]				-0.061	-0.071
Psychology Department[b]				-0.039	-0.025
Chemistry Department[b]				-0.106	-0.067
Math Department[b]				-0.039	-0.039
Climate - Advisor Personal				-0.006	-0.025
Climate - Advisor Program				0.110	0.001
Climate - Advisor Professional				0.299 ***	0.225 **
Climate - Advisor Labor Expect.				0.045	0.020
Climate - Faculty Unbiased				0.259 ***	0.054
Climate - Faculty Collaboration				0.190 ***	0.095
Climate - No Exploitation				0.004	-0.051
Climate - Student Community				0.100	0.024
Climate - No Competition for Faculty				0.003	-0.015
Climate - Faculty Research				0.055	0.057
Climate - Student Governance				0.017	0.017
Climate - Coursework Useful				0.336 ***	0.353 ***
Intercept	2.302	2.419	2.325	0.250	0.079
R^2	0.003	0.017	0.024	0.099	0.253

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is Male, White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program, or Geology as appropriate

Appendix 5A.8 - Coefficients from OLS Regressions of Faculty Collaboration Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
Female [b]	-0.085 ***	-0.062 *	-0.024	-0.025	-0.004
African American [b]		-0.002	0.067	0.098	0.101
Asian American [b]		0.103	0.092	0.020	0.033
Hispanic [b]		-0.077	-0.008	0.034	0.047
Other Race/Ethnicity [b]		-0.062	-0.028	-0.020	0.017
International Student [b]		0.098 *	0.055	-0.018	-0.039
Parent Highest Ed - BA [b]		-0.013	-0.007	0.022	0.025
Parent Highest Ed - MS [b]		-0.100 **	-0.064	0.006	0.004
Parent Highest Ed - Doc [b]		-0.166 ***	-0.135 ***	-0.040	-0.045
Age in the 30's [b]		-0.184 ***	-0.050	0.049 *	0.051 *
Age in the 40's or higher [b]		-0.112 *	0.044	0.189 ***	0.189 ***
Partnered [b]		-0.089 **	-0.085 ***	-0.031	-0.035
Have Children [b]		0.047	0.050	-0.022	-0.020
Year in Program		-0.039 ***	-0.024 ***	-0.014 *	-0.005
Stage in Program - Post-quals [b]		0.007	-0.044	-0.045	-0.027
Stage in Program - Post-proposal [b]		-0.066	-0.129 **	-0.060	-0.062
Stage in Program - Post-defense [b]		0.075	-0.054	-0.098 *	-0.114 *
Advisor Support - Personal					-0.030
Advisor Support - Program					-0.006
Advisor Support - Professional Dev					0.121 ***
Advisor Support - Labor Expect					0.008
Faculty Support - Inclusive					0.179 ***
Faculty Support - Unbiased					0.063 **
Faculty Support - Directiveness					0.038
Faculty Support - No Exploitation					-0.040 **
Peer Support - Community					-0.003
Peer Support - Do Not Compete for Faculty					0.024
Have a Mentor/Second Advisor			-0.087 ***	-0.028	-0.039
# of People Integrated in Diss			0.082 ***	0.018 ***	0.013 **
Student Community Outside Dept.			-0.031 *	0.011	0.001
Private Control				-0.017	-0.009
R&D Expenditures				-0.000	-0.000
Future Faculty Dev Program [b] (National)				0.086 ***	0.087 ***
Future Faculty Dev Program [b] (Local)				0.001	-0.002
Rank of Effectiveness				0.001	0.001
Total Graduate Students				0.000	0.000
Student/Faculty Ratio				-0.020	-0.021
% of Female Students				-0.001	-0.001
% of Minorities				-0.003	-0.003
% of Non US Citizens				-0.000	0.000
% of Research Assistantships				0.003 *	0.003 *
% of Teaching Assistantships				0.001	0.001
Median Years to PhD				-0.006	-0.006

[Appendix 5A.8 continued on next page]

Appendix 5A.8 (continued) - Coefficients from OLS Regressions of Faculty Collaboration Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
English Department [b]				-0.668 ***	-0.669 ***
Philosophy Department [b]				-0.549 ***	-0.550 ***
Art History Department [b]				-0.644 ***	-0.654 ***
History Department [b]				-0.739 ***	-0.739 ***
Sociology Department [b]				-0.016	-0.025
Psychology Department [b]				0.182 *	0.182 *
Chemistry Department [b]				0.070	0.097
Math Department [b]				-0.147	-0.149
Climate - Advisor Personal				0.139 *	0.167 *
Climate - Advisor Program				-0.053	-0.046
Climate - Advisor Professional				-0.012	-0.112
Climate - Advisor Labor Expect.				0.024	0.023
Climate - Faculty Inclusiveness				0.425 ***	0.224 *
Climate - Faculty Unbiased				-0.002	-0.056
Climate - Faculty Directiveness				0.158 *	0.128 *
Climate - No Exploitation				-0.062	-0.015
Climate - Student Community				0.030	0.038
Climate - No Competition for Faculty				-0.041	-0.065
Climate - Faculty Research				0.120	0.120
Climate - Student Governance				0.009	0.009
Climate - Coursework Useful				0.024	0.026
Intercept	2.330	2.776	2.593	0.106	0.059
R^2	0.003	0.062	0.195	0.476	0.518

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is Male, White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program, or Geology as appropriate

Appendix 5A.9 - Coefficients from OLS Regressions of Peer Community Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
Female [b]	0.035	0.046 *	0.039	0.044	0.068 ***
African American [b]		-0.161 *	-0.181 **	-0.163 *	-0.140 *
Asian American [b]		-0.149 *	-0.161 *	-0.174 **	-0.163 **
Hispanic [b]		-0.024	-0.038	-0.035	-0.008
Other Race/Ethnicity [b]		-0.184 **	-0.195 **	-0.176 **	-0.117
International Student [b]		-0.270 ***	-0.253 ***	-0.246 ***	-0.238 ***
Parent Highest Ed - BA [b]		0.035	0.038	0.051	0.051
Parent Highest Ed - MS [b]		0.036	0.041	0.044	0.038
Parent Highest Ed - Doc [b]		0.063	0.058	0.053	0.033
Age in the 30's [b]		-0.128 ***	-0.126 ***	-0.120 ***	-0.107 ***
Age in the 40's or higher [b]		-0.178 ***	-0.169 ***	-0.153 ***	-0.126 ***
Partnered [b]		0.011	0.014	0.018	0.012
Have Children [b]		-0.001	0.004	0.006	0.015
Year in Program		-0.036 ***	-0.036 ***	-0.027 ***	-0.014 **
Stage in Program - Post-quals [b]		0.010	0.009	-0.019	0.010
Stage in Program - Post-proposal [b]		0.060	0.053	-0.012	-0.023
Stage in Program - Post-defense [b]		0.096	0.091	0.037	0.025
Advisor Support - Personal					-0.063 ***
Advisor Support - Program					-0.013
Advisor Support - Professional Dev					0.097 ***
Advisor Support - Labor Expect					0.006
Faculty Support - Inclusive					0.361 ***
Faculty Support - Unbiased					0.193
Bias Squared					-0.034
Faculty Support - Directive					-0.011
Faculty Support - Collaboration					-0.365 ***
Collaboration Squared					0.080 ***
Faculty Support - No Exploitation					0.013
Peer Support - Do Not Compete for Faculty					0.149 ***
Have a Mentor/Second Advisor			0.072 ***	0.064 **	0.041 *
# of People Integrated in Diss			0.005	0.013 **	0.006
Student Community Outside Dept.			0.066 ***	0.074 ***	0.061 ***
Public vs. Private Control				-0.005	-0.001
R&D Expenditures				-0.000	-0.000
Future Faculty Dev Program [b] (National)				0.002	-0.001
Future Faculty Dev Program [b] (Local)				0.043	0.035
Rank of Effectiveness				0.001	0.001
Total Graduate Students				0.001 *	0.001 *
Student/Faculty Ratio				-0.024 *	-0.027 *
% of Female Students				-0.000	-0.001
% of Minorities				0.003	0.003
% of Non US Citizens				-0.002	-0.002
% of Research Assistantships				0.001	0.001
% of Teaching Assistantships				-0.001	-0.001
Median Years to PhD				-0.018	-0.019 *

[Appendix 5A.9 continued on next page]

Appendix 5A.9 (continued) - Coefficients from OLS Regressions of Peer Community Support on Gender and Selected Individual & Organizational Controls

Measure [a]	Model 1 Female No Controls	Model 2 Indiv Demog added to 1	Model 3 Social Capital added to 2	Model 4 Org. Contexts added to 3	Model 5 Social Support added to 4
English Department [b]				0.158	0.167
Philosophy Department [b]				0.209	0.205 *
Art History Department [b]				0.234	0.240 *
History Department [b]				0.054	0.061
Sociology Department [b]				0.230 *	0.199 *
Psychology Department [b]				-0.130	-0.130
Chemistry Department [b]				-0.102	-0.056
Math Department [b]				0.064	0.046
Climate - Advisor Personal				0.087	0.137 *
Climate - Advisor Program				-0.253 **	-0.216 *
Climate - Advisor Professional				0.177	0.093
Climate - Advisor Labor Expect.				0.013	-0.000
Climate - Faculty Inclusiveness				0.277 **	-0.088
Climate - Faculty Unbiased				-0.114	-0.104
Climate - Faculty Directiveness				0.113	0.097
Climate - Faculty Collaboration				-0.356	0.009
Collaboration Squared				0.084	0.007
Climate - No Exploitation				-0.010	-0.021
Climate - No Competition for Faculty				0.392 ***	0.251 ***
Climate - Faculty Research				-0.064	-0.055
Climate - Student Governance				0.068	0.080 *
Climate - Coursework Useful				-0.024	-0.003
Intercept	2.883	3.119	2.925	3.022	2.699
R^2	0.001	0.062	0.076	0.155	0.325

*p = .05, **p = .01, ***p = .001 (two tailed)

[a] Categorical measures include controls for missing values which are not shown here

[b] Referent category is Male, White, Parent Ed - HS, Age in the 20s, Stage in Program - Prequals, No Future Faculty Program, Geology as appropriate

Appendix 5B.1 - **Pearson Correlation Matrix of Professional Self-Concept Measures with Gender & Other Selected Individual Measures**

	Y1	Y2	Y3	Y4	Y5	Y6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23	X24	X25
Y1	1.00	0.54	0.43	0.22	0.00	0.04	0.03	0.01	0.02	-0.01	0.00	-0.01	-0.03	0.01	0.03	0.00	-0.04	-0.06	0.04	0.05	0.05	0.06	0.04	-0.02	-0.03
Y2		1.00	0.21	0.60	0.13	0.10	-0.11	-0.04	-0.01	-0.03	0.00	-0.02	0.04	0.01	0.00	0.00	-0.01	0.03	-0.02	-0.01	0.02	0.00	-0.04	-0.05	-0.04
Y3			1.00	0.43	-0.03	0.08	-0.01	0.06	-0.01	0.04	0.07	0.00	-0.17	0.04	0.04	-0.03	-0.04	-0.05	0.03	0.06	0.06	0.03	0.10	-0.04	-0.03
Y4				1.00	0.15	0.13	-0.12	-0.01	-0.05	0.03	0.00	0.01	0.02	0.03	0.03	-0.04	-0.02	-0.04	0.02	0.04	0.04	0.00	0.02	-0.09	-0.06
Y5					1.00	0.29	-0.06	0.03	-0.01	-0.03	-0.08	0.01	0.12	-0.01	-0.03	-0.01	0.05	0.07	-0.04	-0.05	-0.05	-0.05	-0.07	-0.01	0.02
Y6						1.00	-0.04	0.07	0.02	0.02	-0.08	0.00	0.06	0.02	0.01	-0.02	0.01	0.07	-0.04	-0.05	-0.03	-0.03	-0.07	-0.02	0.01
X7							1.00	0.05	0.01	0.06	0.03	0.00	-0.09	0.02	0.04	-0.03	0.00	-0.02	0.01	0.04	0.05	0.00	0.03	0.08	-0.03
X8								1.00	-0.03	-0.03	-0.30	-0.03	-0.05	0.05	0.00	0.01	-0.06	-0.01	0.01	0.00	-0.06	0.02	0.01	0.02	0.05
X9									1.00	-0.03	-0.28	-0.03	-0.05	-0.03	-0.01	0.02	0.03	0.06	-0.04	-0.03	-0.03	-0.01	-0.03	0.01	0.00
X10										1.00	-0.31	-0.03	-0.06	0.06	0.00	-0.04	-0.01	-0.02	0.04	-0.03	0.01	-0.01	0.00	0.01	-0.01
X11											1.00	-0.29	-0.53	-0.08	0.04	0.03	0.05	0.03	-0.01	0.04	0.11	0.00	0.09	-0.01	0.00
X12												1.00	-0.05	0.00	-0.02	0.03	-0.01	-0.01	0.01	0.00	-0.04	-0.01	0.00	0.04	-0.05
X13													1.00	0.07	-0.01	-0.02	-0.04	-0.01	0.03	-0.04	-0.04	0.01	-0.12	-0.02	-0.01
X14														1.00	-0.27	-0.40	-0.29	-0.13	0.04	0.17	0.02	0.07	0.04	0.03	0.02
X15															1.00	-0.36	-0.26	0.00	-0.02	0.04	0.03	0.01	0.00	-0.01	-0.01
X16																1.00	-0.38	0.04	0.03	-0.10	-0.03	-0.03	0.01	-0.02	-0.03
X17																	1.00	0.11	-0.04	-0.09	0.01	-0.05	-0.06	0.00	0.02
X18																		1.00	-0.78	-0.31	-0.13	-0.25	-0.41	0.05	0.10
X19																			1.00	-0.31	0.10	0.12	0.26	-0.04	-0.09
X20																				1.00	0.09	0.23	0.26	-0.01	-0.03
X21																					1.00	0.33	0.10	-0.03	-0.05
X22																						1.00	0.16	-0.02	-0.02
X23																							1.00	-0.22	-0.21
X24																								1.00	-0.16
X25																									1.00

Appendix 5B.1 (continued) - **Pearson Correlation Matrix of Professional Self-Concept Measures with Gender & Other Selected Individual Measures**

	X26	X27	X28	X29	X30	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40	X41	X42	X43	X44	X45	X46	X47	X48	X49	X50
Y1	0.00	0.05	0.09	-0.07	0.09	0.21	0.23	0.21	-0.08	0.24	0.12	0.19	0.02	0.08	0.13	0.07	0.03	0.20	0.10	0.07	0.06	0.03	0.16	0.11	0.06
Y2	0.01	0.09	0.03	0.17	0.03	0.15	0.27	0.38	0.11	0.30	0.21	0.26	0.26	0.05	0.15	0.14	0.06	0.05	-0.02	0.14	0.24	0.08	-0.04	0.00	0.26
Y3	0.04	0.02	0.13	-0.07	0.12	0.12	0.10	0.10	-0.05	0.04	-0.05	0.04	-0.05	-0.01	0.07	-0.00	0.02	0.17	0.15	0.11	0.07	0.00	0.39	0.26	-0.01
Y4	0.05	0.08	0.08	0.06	0.05	0.07	0.14	0.23	0.05	0.12	0.04	0.12	0.11	-0.01	0.04	0.04	0.06	0.03	0.03	0.16	0.18	0.05	0.02	0.04	0.40
Y5	-0.04	0.04	-0.01	0.05	-0.03	-0.03	0.03	0.07	0.04	0.03	0.03	0.03	0.08	0.03	0.00	0.04	-0.01	-0.04	-0.01	0.02	0.06	0.01	-0.11	-0.08	0.15
Y6	-0.02	0.05	0.04	0.04	0.03	0.05	0.08	0.12	0.01	0.07	0.01	0.05	0.07	0.02	0.01	0.06	0.01	0.00	0.01	0.04	0.10	0.01	0.01	-0.01	0.07
X7	-0.02	-0.02	0.04	-0.08	0.07	0.04	-0.03	-0.03	-0.07	-0.06	-0.08	-0.06	-0.07	0.02	0.03	-0.04	0.02	0.04	0.09	0.10	-0.01	0.07	0.01	0.10	-0.04
X8	-0.05	0.00	-0.02	-0.05	0.08	-0.01	-0.01	-0.04	-0.02	-0.05	-0.07	-0.02	0.00	-0.05	-0.05	-0.01	0.00	-0.03	0.03	-0.01	-0.03	0.05	-0.02	0.03	-0.05
X9	0.02	-0.03	0.01	0.01	0.05	-0.02	-0.01	-0.03	0.01	-0.02	-0.02	0.02	0.01	0.01	0.00	-0.00	0.04	-0.04	-0.01	-0.01	-0.03	0.00	0.00	-0.02	-0.04
X10	0.00	0.00	0.03	-0.04	0.06	-0.02	-0.04	-0.03	-0.01	-0.03	-0.04	-0.01	-0.03	-0.01	0.00	-0.00	0.04	-0.05	0.01	0.02	-0.05	0.01	0.01	0.03	0.03
X11	0.01	0.00	0.04	0.00	-0.03	0.04	-0.01	0.02	-0.02	0.04	-0.00	-0.04	-0.03	0.01	0.11	-0.01	-0.04	0.13	0.06	0.05	0.09	-0.01	0.11	0.03	-0.06
X12	0.01	0.00	0.04	-0.03	0.02	-0.01	-0.03	-0.03	-0.04	-0.03	-0.05	-0.01	-0.01	0.02	-0.04	-0.02	0.00	0.04	0.03	-0.01	-0.03	-0.04	-0.01	0.03	-0.02
X13	0.02	-0.01	-0.07	0.05	-0.06	-0.04	0.03	0.02	0.06	0.03	0.10	0.09	0.07	0.03	-0.10	0.03	-0.01	-0.11	-0.11	-0.10	-0.05	0.01	-0.17	-0.09	0.12
X14	-0.05	0.03	0.00	0.01	0.00	0.03	0.02	0.02	0.04	-0.01	-0.01	0.03	0.04	-0.04	-0.07	-0.03	-0.02	-0.06	-0.01	0.01	0.00	0.04	0.02	0.03	0.03
X15	0.02	0.00	0.01	0.00	-0.01	0.02	-0.01	-0.01	0.01	0.00	-0.02	0.02	0.04	-0.02	0.01	-0.00	0.01	0.03	-0.01	0.02	0.00	0.03	-0.01	0.02	-0.02
X16	0.06	-0.03	0.01	-0.02	-0.03	-0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.02	-0.03	-0.00	0.00	-0.03	0.00	0.01	0.01	0.00	-0.01	-0.03	-0.01	-0.03	-0.03
X17	-0.03	0.01	-0.01	0.01	0.05	-0.02	0.00	0.00	-0.04	0.03	0.04	-0.02	-0.05	0.05	0.06	0.06	0.01	0.02	0.00	-0.03	0.01	-0.03	0.01	-0.01	0.02
X18	-0.06	-0.09	-0.03	0.26	-0.01	-0.04	-0.01	0.08	0.13	0.04	0.04	0.02	0.15	-0.03	0.17	0.09	0.11	-0.02	-0.01	-0.04	0.10	0.02	-0.01	0.01	-0.08
X19	0.05	0.09	0.02	-0.19	0.02	0.03	0.01	-0.02	-0.08	-0.04	-0.05	-0.02	-0.14	0.01	-0.11	-0.06	-0.07	0.05	0.03	0.06	-0.05	-0.01	-0.01	-0.03	0.04
X20	0.03	0.01	0.03	-0.12	-0.03	0.03	0.00	-0.09	-0.07	0.01	0.01	0.00	-0.02	0.03	-0.09	-0.05	-0.06	-0.04	-0.02	-0.03	-0.07	0.00	0.03	0.05	0.05
X21	0.03	0.05	0.04	-0.04	-0.05	0.06	0.01	0.00	-0.09	0.04	0.03	0.00	-0.07	0.05	0.00	-0.04	-0.04	0.01	-0.01	0.06	-0.02	0.00	0.07	0.04	0.01
X22	-0.01	0.05	0.02	-0.08	-0.05	0.07	0.00	-0.03	-0.06	0.01	0.02	0.01	-0.03	0.03	-0.06	-0.03	-0.07	-0.01	-0.02	0.00	-0.04	0.01	0.04	0.05	-0.01
X23	0.18	0.19	0.01	-0.19	0.03	0.02	-0.05	-0.12	-0.11	-0.09	-0.11	-0.05	-0.17	-0.00	-0.15	-0.12	-0.04	0.05	0.06	0.09	-0.04	0.01	0.05	0.03	-0.03
X24	-0.39	-0.11	0.02	-0.03	-0.02	0.03	0.01	0.01	0.01	0.01	0.02	0.02	0.04	-0.02	0.01	-0.01	-0.12	0.00	0.02	-0.07	-0.01	0.04	-0.02	0.03	-0.05
X25	-0.61	-0.17	-0.03	0.03	-0.01	-0.04	-0.01	-0.05	0.11	-0.03	-0.02	0.02	0.09	-0.05	0.01	-0.00	-0.02	0.01	0.00	-0.07	0.02	-0.01	-0.01	-0.01	-0.04

[Appendix 5B.1 continued on the next page]

Appendix 5B.1 (continued) - Pearson Correlation Matrix of Professional Self-Concept Measures with Gender & Other Selected Individual Measures

	X26	X27	X28	X29	X30	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40	X41	X42	X43	X44	X45	X46	X47	X48	X49	X50
X26	1.00	-0.43	0.05	-0.01	0.02	0.00	-0.03	0.01	-0.08	0.02	-0.01	-0.03	-0.10	0.06	-0.01	-0.00	0.07	-0.02	0.00	0.05	-0.03	-0.03	0.04	-0.02	0.03
X27		1.00	-0.05	0.01	0.01	0.03	0.05	0.04	-0.02	0.01	0.03	0.00	0.01	-0.02	-0.01	0.01	0.03	0.00	-0.02	0.08	0.03	0.01	-0.03	0.01	0.05
X28			1.00	-0.13	0.08	0.06	0.01	0.03	-0.04	0.04	-0.10	-0.02	-0.12	-0.02	0.07	-0.03	-0.01	0.07	0.13	0.07	0.03	-0.03	0.06	0.06	0.05
X29				1.00	-0.03	-0.08	-0.02	0.15	0.39	0.01	0.04	0.11	0.40	-0.14	0.09	0.05	0.18	-0.12	-0.13	0.04	0.21	0.05	-0.02	0.02	-0.05
X30					1.00	0.04	-0.01	0.06	-0.01	0.01	-0.05	0.02	-0.06	-0.03	0.10	-0.04	0.01	0.08	0.10	0.05	0.01	0.01	0.08	0.10	0.00
X31						1.00	0.63	0.57	-0.28	0.37	0.17	0.21	0.06	0.16	0.13	0.13	-0.06	0.11	0.03	0.07	0.06	0.01	0.09	0.09	0.05
X32							1.00	0.65	-0.16	0.41	0.22	0.29	0.10	0.15	0.16	0.21	-0.05	0.09	0.00	0.04	0.08	-0.03	0.05	0.03	0.13
X33								1.00	0.04	0.38	0.19	0.31	0.24	0.06	0.23	0.18	0.03	0.09	0.00	0.14	0.22	0.02	0.05	0.03	0.16
X34									1.00	-0.16	-0.14	0.01	0.26	-0.32	-0.01	-0.06	0.13	-0.10	-0.06	0.02	0.18	0.06	-0.06	0.00	-0.04
X35										1.00	0.59	0.51	0.21	0.41	0.40	0.40	-0.04	0.13	-0.03	0.05	0.16	0.04	0.02	0.03	0.10
X36											1.00	0.33	0.20	0.43	0.22	0.39	-0.04	0.03	-0.10	-0.03	0.09	0.04	-0.02	0.01	0.06
X37												1.00	0.24	0.16	0.19	0.23	0.01	0.03	-0.07	0.03	0.14	0.05	-0.01	0.01	0.06
X38													1.00	-0.05	0.13	0.17	0.08	-0.03	-0.08	0.12	0.30	0.12	-0.09	0.01	-0.05
X39														1.00	0.17	0.27	-0.05	0.09	-0.01	-0.05	-0.03	-0.00	0.03	-0.00	0.06
X40															1.00	0.36	0.01	0.17	0.13	0.12	0.15	0.02	0.07	0.05	0.01
X41																1.00	-0.00	0.04	-0.03	-0.02	0.09	0.04	-0.01	-0.00	0.02
X42																	1.00	0.05	0.00	0.04	0.06	-0.01	0.02	0.00	0.00
X43																		1.00	0.19	0.08	0.28	-0.02	0.12	0.02	-0.02
X44																			1.00	0.14	0.03	0.03	0.09	0.12	0.01
X45																				1.00	0.19	0.08	0.02	0.03	0.07
X46																					1.00	0.08	-0.01	0.02	0.05
X47																						1.00	-0.04	0.04	-0.01
X48																							1.00	0.33	-0.15
X49																								1.00	-0.05
X50																									1.00

[Appendix 5B.1 continued on the next page]

Appendix 5B.1 (continued) - Pearson Correlation Matrix of Professional Self-Concept Measures with Gender & Other Selected Individual Measures

Chapter 6: Conclusion

The purpose of this dissertation is to continue the tradition of studying the effects of social interaction and social relationships on the outcomes of education, and to understand how these effects often serve to reproduce inequality, including those based on individual characteristics such as gender. In addition, this research also expands the traditional education literature through the use of a new analytical measure (social support), and by focusing on a segment of the educational system that gets far less attention in the sociology of education research (graduate education). Analytically, this project borrows the multidimensional concept of social support from the medical sociology literature in order to take a more network oriented approach to studying social interactions and relationships.[1] Measures of social support allow researchers to explore more qualitative aspects of relationships as opposed to the more quantitative nature of traditional measures of social capital and network structure. Applied to a sample of graduate students, this analytical approach investigated how relationships between students and their advisors, faculty, and peers help them to accumulate resources that aid them in their development as future academic professionals.

Social Support as Relationship Resources

Based on the successful use of social support in the medical sociology literature, this dissertation hypothesized that social support could also be used within an educational setting to measure social interaction and capture the qualitative nature of interpersonal relationships and the resources that they provide. Furthermore, rather than focusing on

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[1] Although the approach comes from a relationship network orientation it is not a "network analysis" in the traditional sense.

global measures of social support, this study suggests that it is more beneficial to focus on the functional dimensions of support to distinguish between the different types of supportive interactions and relationships that can take place among the members of a graduate department.

The concept of social support does effectively explain the nature of interactions and relationships between students and their advisors, faculty, and peers. Results of analysis indicated that the various dimensions of social support effectively "mapped onto" the data.. The measures from the SDE fit very well into the typical dimensions of the source, type, and amount of resources being provided. Factor analysis yielded nine scales of social support based on good measures of validity and internal reliability.

Four measures of advisor support, four measures of faculty support, and one of peer support, permitted the assessment of the level and quality of different types of resources that could be attained from and/or the relational demands that must be dealt with as part of the interactions with each potential source of support. Interactions with advisors could be assessed not only in terms of the emotional support that they provided (*personal support*), but also based on the instructional and informational assistance that helped students to progress through their academic course of study (*program support*) and to begin preparing for their academic careers (*professional development support*). One measure also assessed the relational demands that advisors expected from students in terms of their time and quantity of work (*labor expectations*). Measures of faculty support helped to assess if interactions with the general faculty helped students to become valued and cared for members of the department (inclusive support), provided explicit instruction and information, especially with regard to assistantships (directive support),

and assisted students with the process of research and publication (collaboration support).

One measure also assessed if faculty were fair and egalitarian in their provision of their

support (*unbiased support*). Finally, the one measure of peer support helped to indicate

that interactions with other graduate students offered informational, instructional, and

emotional forms of assistance (*community support*). With this approach, rather than

focusing simply on the number of times a student interacts with a faculty member outside

of class, which is a typical approach in the higher education literature, it is possible to

determine if interactions with different departmental members are perceived as

qualitatively beneficial based on several functional criteria.

Social support in this study has it limitations, however, because it is a measure of

the perceived support of graduate students in response to interactions with advisors,

faculty, and peers, and as such, social support is not a measure of the actual behaviors

experienced or the resources that were provided. This distinction allows for the

possibility that there can be a difference between what a student perceived as support and

what support they actually received or was intended to be given. It also makes it possible

that two students could receive the same amount of actual support, but perceive that

support differently. Any interpretation of support outcomes or influence of social support

must be made with the understanding that social support is a subjective assessment of the

type, amount, and quality of the resources received from social interactions and

relationships. Therefore, differences in social support and thus accumulated resources

are only based on the perception that students have been provided or have obtained these

types of support and resources. This limitation does not negate the utility and importance

of this research, but future studies would benefit from also taking objective measures of

support into account, including the more standard measures of how often students meet with faculty and advisors.

Having measures of social support is good news for researchers, graduate schools, and graduate departments, who have always assumed that advising and faculty support outside of the classroom were beneficial, but had very few good methods or measures for defending their claims. In the current environment where accreditation teams are looking for more accountability and student outcomes assessment, social support can potentially illustrate both the outcomes of departmental advising and the influence of social support on other student outcomes such as retention, time to degree, and career placement. So, as demonstrated in this dissertation, social support, conceptualized as resources accumulated through social interaction, not only provides the means for effectively measuring the qualitative aspects of social interaction within an educational setting, but also provides researchers and practitioners with another means to link components of the educational process to educational outcomes and possible inequalities.

The practical usefulness of social support, however, depends greatly upon institutional actors and the manner in which information on social support is collected and utilized. For example, information on social support can be collected as a part of regular formative assessments of departments and graduate programs. However, everyone involved must accept the idea that the information will be used for the improvement of the program and not in a punitive manner against students or faculty. If faculty and/or students feel that the information about social support will be used against them, then students may not respond honestly (if at all) to the questions, and faculty may not be willing to accept the results or any policy changes based on them. Just as teaching

evaluations ideally should be used to help improve teaching and student learning,

measures of social support can be used as advising evaluations to indicate areas in which

support through advising and interactions out of class could be improved to enhance

student professional socialization. Information on social support should be gathered on a

regular basis, and should be connected to accreditation and departmental self-study if it is

going to be accepted by department members and utilized effectively.

The Effect of Organizational Contexts on Social Support

This dissertation has also argued that social support, conceptualized as resources

accumulated through social interaction and relationships, is an important outcome that

should be examined both to make sure that students are getting the valuable support that

they need and to determine what factors facilitate and impede its accumulation. Looking

at social support as an outcome focuses on the manifest effects of social interactions with

advisors, faculty, and peers, which help students to perceive that that they are being

assisted by the other members of their department and being provided with the emotional,

informational, and instructional resources that they need to succeed in their graduate

education. From this perspective, social support is a valuable and positive outcome,

which graduate schools and departments should try to maximize.

Based on the literature that conceptualizes social support as part of social

relationship networks along with social capital and network structures (e.g. – House et al.

1988), this dissertation assumed that the types of factors that caused changes in social

capital and social network structure would also affect social support. Thus, differences in

organizational contexts are hypothesized to lead to differences in perceptions of social

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support. Also, this study hypothesized that the departmental contexts of department characteristics, disciplines, and climates would collectively and separately have a larger impact on social support than institutional factors. Finally, this reseacrh suggested that specific factors within any one organizational context can have a positive or negative impact on social support which could differ depending on the type of support being influenced.

Results indicated that differences in organizational contexts can lead to variability in the amount of social support that is perceived. As suggested by the literature, social support, as part of relationship networks along with social capital and network structure, can be affected by the organizational contexts that help to shape the size, density, composition of members, and functional purpose of social networks. Numerous measures of institutional characteristics, departmental characteristics, departmental disciplines, and departmental climates were independently and collectively entered in to multivariate regression models to assess their overall and specific impact on all nine measures of social support. As hypothesized, institutional and departmental contexts together had an overall significant effect on the variability in social support perceptions. Results from both OLS and multilevel modeling confirmed that organizational factors accounted for 5% to 48% of the variability in social support.[2] These results illustrate that in shaping the nature of social networks and determining who is part of specific networks, under what conditions, and for what reasons, organizational factors strongly influenced the access some people had to others in the network, the purpose of their interactions, and ultimately how supportive these interactions were.

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[2] Explained variability at the organizational-level totaling between 5% and 20% are common in educational research (Snijders & Bosker 1999). Although 5% of the variance may seem like a small amount, it can contain statistically and substantively significant effects that can and should be examined.

Results also showed several patterns in the effects of certain organizational factors for enhancing or limiting perceptions of social support. For example, institutional factors always accounted for the smallest proportion of the effects on each type of social support, and only few institutional effects retained an independent significant effect once all other organizational factors were included in the models. The effects of private school status and increased research expenditures had negative effects on social support, whereas participation in future faculty development programs had positive effects. Thus, there were effects of institutional contexts on perceptions of social support, but the overall impact was very small.

Departmental factors made up the larger proportion of the effects of organizational contexts, and there were also some relative differences in the impact of departmental characteristics, disciplines, and climates on perceptions of social support. Departmental characteristics that focused mainly on the factors that shape the size and composition of department networks usually had the smallest overall effect on social support. Departmental disciplines that established the culture, purposes, and means for interacting within networks had a more sizable influence on perceptions of social support. However, departmental climates usually had the largest overall influence on social support by providing students with information that allowed them to compare other students' attitudes about the departmental environment with their own. Climates can, therefore, help students to gauge which sources and types of support are more likely to be helpful. Although as groups of variables each organizational context had varying levels of influence on perceptions of social support, these contexts were very interrelated and any one accounted for a sizeable portion of the effects of the others.

Although institutional and departmental factors had a significant overall impact on the perceived accumulation of resources, because all of these organizational contexts were extremely interrelated and interconnected, determining the unique and significant impact of any one organizational factor on a particular type of social support was somewhat difficult; however, a few distinct relationships remained even after accounting for the effects of all other organizational factors. Increased student faculty ratios, which can force faculty and advisors to spread their resources and time more thinly over a greater number of students, decreased the amount of most types of social support that graduate students perceived. Also, the science and lab disciplines, which tend to have more defined disciplinary cultures and structured methods of interaction, had a more positive effect on the perception of many types of social support than many humanities and social sciences. Lastly, departmental climates in which faculty made students feel that they were included and valued as a part of the department significantly increased the social support that students perceived from advisors, faculty, and peers. Thus, not only did organizational contexts have an overall impact on social support, but also specific factors within those contexts significantly affected the perceptions of social support in positive and negative ways.

It is important to remember that these results need to be interpreted from the perspective that social support is referring to perceived support rather than received support. Perceptions of support may indeed be indicative of the actual behaviors that have taken place, but this cannot be determined. If perceived and received supports are equal, then some institutions and departments are providing better access to resources than others. However, since this is not certain, we must conclude that different

organizational contexts create conditions that differentially influenced students'

perceptions of the support and resources that they received. Although it cannot be

determined if organizations are being intentionally discriminatory, because behavioral

outcomes are more accurately based on the perception of social support than on actual

social support (Antonucci and Israel 1986; Turner & Marino 1994), the results may be

the same. Students, who because of the organizational context of their graduate

programs, perceive lower levels of social support and therefore will act as if they have

been provided with less supportive resources.

These differences in perceptions of social support are important because, if social

support is considered as the resources accumulated through social relationships, then

student resources can vary depending on the institutional and departmental contexts of

their graduate education. Therefore, structural components of graduate education can

cause inequality in the perceptions of social support and the accumulation of various

resources, which most likely leads to the unequal training and professional socialization

of graduate students.

Because various organizational contexts can and do have an effect on perceptions

of support, effective and responsible graduate schools and departments need to be aware

of the contextual factors that can positively and negatively influence the perceptions of

social support of their students. For example, because private schools and schools with

higher research expenditures tend to have lower perceived levels of some forms of

advisor and faculty support, these institutions would be advised to take part in future

faculty development programs, which are associated with positive perceptions of social

support, to counteract these negative effects. Also, because of the numerous negative

effects of student/faculty ratios on perceptions of faculty support, graduate programs should be cautious of increasing graduate student enrollments without also increasing their number of faculty members. Also, if graduate schools are trying to increase the overall support within their various programs, they can use the knowledge that some disciplines tend to have different levels of certain types of social support in order to better target and fund more structured advising and support initiatives in the places where they can make the greatest impact. Finally, departments should understand that climates have a large and positive impact on individual perceptions of support, and, in particular, that increasing the overall perception that faculty care about and include students as part of the graduate program can do a great deal to increase most perceptions of social support within a department. Because social support is based on connections within social relationship networks, if graduate schools want to increase social support across or within departments, then they need to understand that structural, disciplinary, and climate factors are the source of some of these differences in social support and therefore, can impede as well as enhance their efforts.

The Effect of Social Support on Socialization Outcomes

Although it is important to determine what factors influence the perceptions of social support, differences in social support would take on added importance if the differential accumulation of these relationship resources led to differences in other important outcomes. Therefore, it is essential to understand how perceptions of social support affect other outcomes related to graduate education and professional socialization. This dissertation argued that social support, conceptualized as resources

accumulated through social interaction, should also be examined to determine if these relationship resources have an effect on the development of particular components of students' professional self-concepts. Looking at social support as a factor of influence also takes into account some of the more latent and indirect effects of social interactions with advisors, faculty, and peers. If social support is a valuable resource that can impact the outcomes of graduate education, graduate schools and departments should try to understand these influences so that their positive impact can be maximized and their negative influences reduced for the benefit of all those involved.

Throughout the sociology of education literature, resources are connected to education outcomes; therefore social support should affect educational outcomes. Based on the sociology of education literature, which explains that faculty and peers act as agents of socialization and that interactions with these agents contribute to educational outcomes, this dissertation hypothesized that social support would have an effect on various professional socialization outcomes. Because the different forms of social support are viewed as valuable resources, this study specifically hypothesized that increases in social support would result in increases in professional socialization, although different forms of support may be more useful for some socialization outcomes than for others.

Using a multidimensional conception of professional socialization from Becker and Carper (1956) that focuses on both the acquisition of professional culture and the acquisition of a professional identity, a set of analyses were conducted on a sub-sample of students who were interested in becoming faculty members. Four outcomes determined how prepared and confident students perceived themselves to be in terms of

their ability to conduct faculty related tasks at either the undergraduate or graduate level. Two other outcomes also analyzed student preferences and expectations for working at bachelor's level institutions rather than doctoral level universities.

Results of analyses indicated that social support had a significant overall impact on the preparation and confidence to conduct faculty tasks, and that these effects are usually positive; however, the overall effect of social support was much stronger on task preparation than it was on task confidence. Measures of social support accounted for the largest percentage of the variability in the task preparation of students, with social support explaining twice as much of the differences in graduate task preparation than for undergraduate task preparation. Conversely, social support explained a much smaller percentage of either undergraduate or graduate task confidence, and accounted for about half of the variability in task confidence that task preparation explained. However, since social support determines a significant percentage of task preparation, it can be inferred that social support had both a direct and indirect effect on faculty task confidence. Thus, social support is an important tool for understanding how interactions with departmental members influence the preparation and confidence to conduct faculty tasks, but the effects of social support are stronger and more direct for task preparation, particularly at the graduate level.

There were also some important patterns in the effects of specific types of social support on task preparation and confidence. The support coming from advisors and peers focused only on graduate level tasks, was sometimes curvilinear as well as linear, and except for advisor personal support, increased student perceptions of preparation. Faculty support was much broader in its effects on both preparation and confidence, but

the effects on confidence were more negative than positive. Therefore, interactions with advisors, faculty, and peers provided a means for students to increase their sense of preparation as members of the academic profession, but the positive effects of social support were concentrated on the preparation for graduate tasks. Also, it is important to recognize that social support, although it may be positive in and of itself, is capable of having a negative effect on socialization outcomes related to the preparation and confidence to conduct professional tasks.

Social support, however, had a much smaller impact on the preference and expectation to work at bachelor's level institutions rather than doctoral level ones. Social support only explained a small percentage of the variability in preferences and expectations, especially when compared to the impact of individual characteristics, organizational contexts, and enjoyment of professional tasks. However, higher levels of advisor professional development support increased the expectation that students will work at doctoral level institutions as compared to bachelor's level ones, and more peer support decreased these preferences and expectations. Also, although it appears contradictory, when faculty did not exploit graduate students, their preference and expectation for working at doctoral level institutions increased, but these preferences or expectations decreased when faculty were more collaborative or unbiased. Thus, although their overall impact is somewhat limited, measures of social support can help to explain some aspects of institutional preference and expectations.

Therefore, individual levels of social support are important because they can have a significant effect on outcomes related to students' socialization into the academic profession. The overall impact of social support on professional socialization was

usually positive, but specific positive effects were more or less valuable relative to particular socialization outcomes. Also, it is essential to understand that social support also had a negative effect on some aspects of a student's professional self-concept. Thus, it is imperative that the influence of social support on professional socialization be interpreted in light of the educational and career goals of students, departments, and graduate schools.

If the impact of social support can be relative to particular types of support and outcomes, then advisors and faculty need to be cautious about assuming that all forms of support will equally enhance every aspect of student socialization. If one of the main goals of graduate education is to teach students to serve as future faculty members at a variety of institutions, but most forms of social support are beneficial for preparing professionals to conduct tasks related to research and working with graduate students, then faculty and advisors need to find more effective ways to support students in order to prepare them for working with undergraduates and taking part in campus level service. Also, faculty should realize that although social support may be useful for preparing students for future faculty tasks, if they want their students to be more confident in their ability to actually carry out these tasks, they should advise them to take part in more direct methods of resource development that include opportunities for students to become involved with and to practice these tasks. Social support in graduate education does enhance student socialization, but as it is currently practiced in this sample of programs, it falls short of the goal of effectively socializing students into all aspects of the academic profession.

Advisors and faculty also need to be cautious about assuming that all students desire the same professional socialization outcomes, and thus providing all students with the same types and levels of social support. On one hand, because of the benefits for both undergraduate and graduate task preparation, faculty should be more inclusive and more directive, and advisors should provide high levels of program support, but on the other hand, advisors should be wary of overemphasizing other forms of support if the professional goals of their students are not clear. For example, although a certain level of minimum competency is necessary, departments should not try to make every student feel just as prepared and confident to conduct research and graduate level tasks if many of these students have no desire to conduct their own research or teach graduate students. Increased faculty collaboration support increased student preparation to conduct research and graduate level tasks, but the relationship to undergraduate level tasks is curvilinear where less faculty collaboration actually increased feelings of preparation. Rather than teaching towards a single professional profile, faculty who would want students to feel properly prepared for their future careers would need to have an understanding of their students' career goals in order to provide the proper level of collaborative support for each of their students. Differences in how organizational actors view the goals of the educational process changes the implications of social support in that process as well as the roles and responsibilities that actors have in the social interactions that create this support.

These recommendations are made with the understanding that results of this study are exploratory and further study and analysis is necessary. Results were based on the effects of individual measures of social support with all else being equal. However,

because of the strong correlations between the various social support measures, it is likely that there are interactions between the various support measures that could influence the effects of particular types of support on socialization outcomes and thus the implications for advising. For example, although advisor personal support was reported as having a negative effect on the sense of preparation to conduct graduate level tasks, the initial bivariate relationship was positive and the coefficient became negative only when other forms of social support were introduced into the model. Secondary analysis indicates that there is a significant positive interaction effect between advisor personal support and advisor professional development support for the effect on both undergraduate and graduate task preparation. This indicates that the effect of advisor personal support on socialization is not necessarily negative if it is provided in combination with other forms of support. Therefore, faculty should not necessarily conclude that being personally supportive is detrimental to their advisees. Personal support in and of itself may have more immediate positive effects; however, faculty should be cautious of overemphasizing personal forms of support, especially at the expense of other forms of support that are shown to be more beneficial on their own.

Social interaction between departmental actors, therefore, does provide resources that can be beneficial for the professional socialization of graduate students; however, the resources can be more beneficial for some socialization outcomes than others and may even be detrimental to certain outcomes. As institutional actors, faculty and advisors need to be aware of the potential impact of their advising behaviors, but as autonomous participants in these social interactions, students also have a responsibility to inform their faculty and advisors of their professional goals so that faculty have the information

needed to best advise them. Social support has the potential to enhance the educational experience of graduate students, but because of the relative nature of its influences, and the tendency of graduate programs to support some socialization outcomes more than others; it is a resource that should used carefully and with the proper information being exchanged by all actors involved in these relationships.

The Effect of Gender on Social Support and Socialization Outcomes

Like the more recent literature on graduate and professional student socialization, this dissertation takes an integrative approach in suggesting that both organizational and individual factors play an important role in a socially interactive professional socialization process. Therefore, just as organizational factors influenced the perceptions of social support, this dissertation also hypothesized that individual factors such as gender would also affect the perceptions of social support. Based on previous studies of graduate education that show women perceive less generalized support from faculty than men (e.g. Fox 2001), and also based on the social network literature that indicates women tend to have smaller and more homogenous networks (Moore 1990), this study specifically hypothesized that women would tend to perceive lower levels of several types social support as compared to men except with regard to emotional support. Based on the extant literature on educational inequality and graduate education, this dissertation also hypothesized that gender would have an effect on professional self-concepts, and that social support would account for a proportion of these effects. Specifically, it is suggested that the effects of gender and social support would lead to women feeling less prepared and confident to conduct faculty tasks than men, especially at the graduate level,

and that this would contribute to women preferring and expecting to work at bachelor's level institutions rather than doctoral level universities.

Results indicated that gender does have a significant impact on the perception of social support, but although women perceive lower levels of some forms of social support, they also perceive higher levels of others. After controlling for all other variables, female graduate students perceived significantly higher levels of personal support from advisors and more community support from peers, but women also perceived faculty as providing less inclusive and less unbiased support. There appeared to be no differences in the perceptions of male and female graduate students with regard to the forms of social support that mainly provided informational and instructional assistance. However, as the literature suggests, women tended to perceive higher levels of support that contain a larger emotional component, at least from smaller social networks (advisor personal support) or from groups more like themselves (peer community support). The lower perceptions of faculty inclusive and unbiased support also had little to do with informational and instructional information, but were focused more on the manner in which faculty interacted with students to provide them with information and instruction. So, as hypothesized there is gender inequity between men and women in the perceptions of some forms of social support; however, women have both significantly higher as well as lower perceptions of some forms of social support, and this may lead to differences in the types of resources that are typically accumulated by women as opposed to men.

At this point it is important to remember that measures of social support are based on perceived rather than received social support because it directly affects the possible

interpretations of why men and women perceive different levels of support. If perceived

support is indicative of the amount of actual support that is received, then it can be

inferred that both women and men experience forms of capital deficit (Lin 2000) where

either faculty are providing differential support to men and women, or male and female

graduate students are themselves seeking out different types and/or levels of support. It

may even be a combination of both types of differential investments. On the other hand,

if perceptions of social support are not necessarily indicative of the amount of actual

support received, it may be that men and women experience different levels of social

support because men and women perceive some forms of social support differently. The

recommendation to faculty is to always err on the side of providing equal support to

graduate students unless it is known that providing certain types of support would

conflict with the educational and/or career goals of the individual student. Even then,

faculty in their advising role should inform students of the consequences of certain

courses of action (the effect more or less support could have on various socialization

outcomes) so that both the faculty member and graduate student together can make more

informed decisions about their advising relationship as well as the student's training.

Because, as mentioned in the previous section, the impact of social support can be

relative to particular types of support with specific outcomes, the differences in the types

of support that men women and men accumulate will likely contribute to differences in

their socialization outcomes, thus leading men and women towards different levels of

preparation and confidence and towards different career paths. For example, increased

advisor personal support and lower faculty inclusive support contributes to women

feeling less prepared to conduct research and graduate level tasks. Lower graduate level

preparation decreases graduate level confidence and thus decreases the preference for working at doctoral level institutions. Thus, it is likely that in addition to the effect of gender on social support, there would also be an effect of gender on the professional self-concept outcomes of professional socialization, and that this effect would be due at least in part because of the gender differences in social support.

Analyses did indicate that most professional self-concept outcomes did differ for men and women, and social support played at least a moderate role in these results. Although women did not perceive themselves as being less prepared to conduct undergraduate tasks, they did see themselves as less prepared to conduct research and graduate level tasks, and women were less confident in their ability to conduct both undergraduate and graduate tasks. Women were also significantly more likely to prefer to and to expect to work at bachelor's level institutions rather than doctoral level universities. Social support accounted for a proportion of the effect of gender on these outcomes, especially with regard to the preparation and confidence to conduct graduate level tasks. However, even with the variability of all controls held constant, gender still had a significant effect on socialization outcomes. Therefore, even if male and female graduate students were to perceive the same amount of social support from advisors, faculty, and peers, the unequal effects on socialization outcomes would still exist.

This study has shown that social support is a very useful tool for studying social interaction within graduate education, and that current patterns of social support contribute to the unequal socialization outcomes including outcomes based on gender. Interactions and relationships in graduate school appear to make it more difficult for men to acquire the preparation and confidence they need to pursue a career at an institution

that focuses on teaching and advising undergraduates and more difficult for women to pursue careers at research universities. Results indicated that advising and general support by faculty and peers plays an important role in the training of graduate students and should be equally provided as one means to counteract the unequal effects of gender on graduate education. Some faculty may feel that providing an overabundance of support for women may further compensate for gender differences in socialization outcomes, but they should keep two things in mind. First, although social support is a valuable new tool in the study of educational inequality, it is only one of many factors that can impact the effects of gender, and even with multiple factors taken into account the significance of gender still remains. Second, although the desire to create an equal representation of female faculty within graduate education is a noble cause, the primary obligation of faculty is to the education of their students and preparing them for the profession. Faculty can and should inform students of how larger macro forces may have influenced their preferences and that they have other options, but faculty should not advise and support students in a manner that would counteract a student's personal goals.

Ultimately, results of this dissertation provide more information to help both students and faculty develop better cognitive maps for navigating the social relationships that take place in graduate school. The processes and objectives of graduate departments need to be more explicit and clear to both faculty and students. Advisors and faculty need to understand how the goals and interaction processes of the department may possibly affect their advising and supervisory behaviors. Students also need to be explicit with their advisors and faculty members so that faculty can best advise them based on their understanding of the department and the student's particular aspirations. With a

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better understanding of students' educational and career aspirations, faculty can best advise students when their goals may be unrealistic or out of step with the department or even the profession itself.

In summary, this dissertation applied the concepts of social support to the interactions of graduate students with their advisors, faculty, and peers as a means to understand how relationships within the networks of graduate education can foster professional socialization and reinforce the reproduction of inequality. Organizational contexts can provide more or less access to relationships and thus to the perception and accumulation of social support and various resources. Differences in social support can lead to differences in socialization outcomes, especially the preparation and confidence to accomplish faculty tasks related to research and graduate teaching and service. The end result is that men and women are more likely to aspire to or expect to work at different types of institutions, which will most likely maintain the current gender imbalance in graduate level faculty. Therefore, social interactions within graduate schools usually lead to perceptions of social support that reinforce the gender distinctions in the education, aspirations, and expectations that are the outcomes of professional socialization.

Further Study

Results of this study point to a few areas of further study. First, other studies should continue to address the association of social support with socialization outcomes while trying to address some of the limitations of this particular study. Second, future studies should try to investigate the socialization process itself and how the social support

affects this process over time. Third, additional studies could assess the role of social support within other educational settings. Finally, more research should investigate the possibility that various social groups perceive social support in different ways.

It would be useful to have future studies that confirm and extend the findings of this dissertation while also addressing some of its limitations. Having a sample that included first and second year students and was more representative of graduate students and graduate departments in the U.S. would make it easier to generalize results with greater confidence. Also, adding missing measures such as measures of financial aid, academic abilities, and prior career aspirations would confirm the effects of social support while controlling for other factors that have been shown to be connected to some of the outcomes used in this study. Lastly, it is also important to investigate if there are changes in the effect of support while controlling for or interacting with measures of actual received support. Social support has been shown to be a useful tool in the study of education, but this study is exploratory and its results need to be replicated and scrutinized.

Because the data for this study were cross-sectional and not longitudinal, it was only possible to determine the relationship between student assessments of relationships at one particular point in time and the effect of this support on socialization outcomes. However, further studies using quantitative and/or qualitative longitudinal approaches could determine the effects of continued support on particular outcomes. For example, another possibility is to examine how the type of social support provided changes over time, so that students who perceive that they are well supported by a particular faculty member may try to access different types of support from that individual. Relationships

are dynamic and change over time, therefore studying the process of socialization should also address these aspects of relationships as well.

Also, this dissertation is trying to join with other researchers to expand the concept of social support to address the activation of social relationships. Most notably, Stanton-Salazar (1997) addresses how issues related to race can complicate social interaction for Mexican adolescents in ways that white students never have to consider. These interaction complications lead barriers that make accessing and accumulating capital more difficult for a particular group of students. This dissertation has attempted to start a similar line of research, but coming from the perspective of gender. Further study needs to examine specific ways in which gender affects social interactions and how and why women do or do not engage in relationships in order to receive social support and accumulate resources.

Using social support in educational research allows researchers to examine many more dimensions of relationships and social interaction, therefore the use of social support should be extended to other educational settings. For example, although personal support from advisors was not beneficial for graduate students, it may be important for children in elementary schools to perceive that their teachers or parents care about their emotional well-being. Different types and forms of social support may provide different benefits depending on the age, class, gender, or race of students.

But, these broader applications must also take into account that assessments of social support may be individual *perceptions* of support and not measures of received support. From a policy point of view, this can be extremely important because, if certain groups of people tend to view social support differently, then even if trying to treat all

groups equally and fairly, unequal outcomes may still result. This possibility of differential perception would provide experimental social psychologists an excellent opportunity to test the assessments that different groups make in response to common exposures of supportive interactions or scenarios. A better understanding of how and why people make different assessments of support would strengthen its ability to be properly applied to broader areas of study.

Final Thoughts

Faculty and graduate school administrators need to pay serious attention to advisor, faculty, and peer interactions with graduate students and how it is structurally and programmatically encouraged, inhibited, and executed within graduate departments. Structural, cultural, and climate components of an institution or department can shape and alter interaction patterns and relationship networks, significantly affecting the amount of social support that students perceive from their advisors, faculty, and peers. Social support is important because as accumulated resources it influences many of the socialization outcomes of a graduate education including the preparation and confidence to perform tasks as future faculty members. Institutional agents must also realize that individual factors such as gender can influence perceptions of social support and socialization outcomes and that all of these effects must be taken into account when advising students to insure that the educational and career goals of the profession, department, and students are being met.

Hopefully the results of this study will have broader effects in academic, programmatic, and interpersonal settings. Academically, the results of this dissertation

provide sociologists and higher education researchers with new tools and perspectives for examining inequality in education, the accumulation of capital and resources, and the socialization of graduate and professional students. Programmatically, this study can assist professional associations, departments, and graduate schools in targeting factors that can be used to emphasize the importance of faculty advising, increase social support, and improve socialization into the academic profession. Interpersonally, this project can help inform both faculty and graduate students so that both parties may enter into their advising relationships better informed and more likely to achieve beneficial and equitable outcomes.

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Zappert, Laraine T. and Kendyll Stansbury. 1984. *In the Pipeline: A Comparative Analysis of Men and Women in Graduate Programs in Science, Engineering and Medicine at Stanford University*. Stanford, CA: Stanford University Institute for Research on Women and Gender.

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EDUCATION

Doctor of Philosophy, December 2007
INDIANA UNIVERSITY, Bloomington, IN
  Major: Sociology
  Minor: Higher Education
  Concentration: Sequence in Higher Education and Pedagogy – Preparing Future Faculty (PFF) Program
    Dissertation: **Social Support in Doctoral Education: The Role of Relationship Resources and Gender in Graduate Student Professional Socialization**
  Committee: Brian Powell (Chair), Deborah Carter, Bernice Pescosolido, and Pam Walters

Master of Science, 1994
SYRACUSE UNIVERSITY, Syracuse, NY
  Major: Higher Education Administration and College Student Development

Bachelor of Arts, *Magna cum Laude*, 1990
BRANDEIS UNIVERSITY, Waltham, MA
  Majors: Sociology and Psychology

FELLOWSHIPS & GRANTS

Departmental Research Fellowship, Department of Sociology, Indiana University, 2003
Graduate Tuition Scholarship, Department of Sociology, Indiana University, 1998-2002
Graduate Tuition Scholarship, Department of Higher Education, Syracuse University, 1993-1994

HONORS & AWARDS

Graduate Student Paper Award, North Central Sociological Association, 2001
Phi Beta Kappa, Brandeis University, 1990

TEACHING INTERESTS

Sociology of Education
Race, Class, and Gender
Undergraduate Statistics and Research Methods

Introduction to Sociology/Social Problems
Environmental Sociology
Sociology of the Family

PEDIGOGICAL TRAINING

Preparing Future Faculty (PFF) Program: Sequence in Higher Education and Pedagogy
Department of Sociology, Indiana University- Bloomington
    Three course training sequence: *Teaching of Undergraduate Sociology*
                                            Social Issues in College Pedagogy
                                            Sociological Research in Higher Education

TEACHING EXPERIENCE

Visiting Assistant Professor, 2005-present
Department of Sociology, Grand Valley State University
Social Problems; Introduction to Sociology; Research Methods; Race, Class, Gender & Sexuality

Instructor, 2001-2003
Department of Sociology, Indiana University- Bloomington
Introduction to Sociology; Statistics for Sociology

Instructor, 1999-2000
Kelley School of Business, Indiana University - Bloomington
Career Planning

Graduate Teaching Assistant, 1998 - 2000
Department of Sociology, Indiana University - Bloomington**,**
Introduction to Sociology; Mental Illness

RESEARCH INTERESTS:

Sociology of Education
Race, Class, and Gender
Organizational Structure & Behavior

Scholarship of Teaching and Learning (SOTL)
Self-Concept and Identity
Stratification/Inequality

PUBLICATIONS

Pescosolido, Bernice A., Jeni Loftus, Stacy Scherr, Laura Fingerson, Katherine Gold Hadley, Jenny Stuber and Paul R. Namaste. (2004). "The Three Faces of SOTL: The Contribution of the Summer Freshman Institute Project to Service, Teaching and Research," in William Becker and Moya Andrews (Eds.) <u>The Scholarship of Teaching and Learning in Higher Education: The Contribution of the Research University</u>. Bloomington, IN: Indiana University Press.

PAPERS IN PROGRESS

Namaste, Paul. "Social Support as Relationship Resources in Graduate Student Socialization."

Loftus, Jeni & Paul Namaste, "Expectant Mothers: Explaining Women's Infertility Utilizing Identity Theory"

PRESENTATIONS

Namaste, Paul R. "Social Support in Doctoral Education: The Role of Relationship Resources in Graduate Student Professional Socialization." Scheduled for presentation at the North Central Sociological Association, Cincinnati, OH, March 2008.

Namaste, Paul R. "Disciplines, Departments, and Doctorates: Social Support, Inequality and the Hidden Curriculum in Graduate Education." Presented at the Midwest/North Central Sociological Association, Chicago, IL, April 2007.

Namaste, Paul R. "Disciplines, Departments, and Doctorates: The Effect of Capital and Curriculum on Graduate Student Experiences and Outcomes." Presented at the Annual Conference of the Association for the Study of Higher Education (ASHE), Kansas City, November 2004.

Ruggerio, Paul & Jeni Loftus. "Don't Tell Me to Just Relax!: An Identity Theory Approach to Women's Infertility." Presented at the annual meeting of the American Sociological Association (ASA), Washington, DC, August 2000.

RESEARCH EXPERIENCE

Research Assistant, "Study on Education Research," Pamela Walters, Principal Investigator, 2001-2003.
Department of Sociology, Indiana University - Bloomington
> Developed data collection, management, and presentations for the joint committee of the National Academy of Education and the Social Science Research Council to evaluate the state and quality of research on education in the United Sates, and the effect that this research has on public policy.

Research Assistant, "Evaluation of the Summer Freshman Institute at Indiana University – Bloomington," Bernice Pescosolido, Principal Investigator, 2001-2002.
Department of Sociology, Indiana University - Bloomington
> Administered baseline and exit survey instruments in a transitional academic program of 120 students. Coded, input, managed and analyzed data. Met with Institute faculty and administration to discuss program strengths, weaknesses, and strategies for program improvement.

Research Assistant, "A Tracking Study of Foster Children," Jane McLeod and David Takeuchi, Principal Investigators, 2001.
Department of Sociology, Indiana University – Bloomington
> Assisted in the development of a survey instrument given to foster children in the state of Indiana. Supervised graduate students and case management during phone survey data collection. Conducted individual interviews. Coded and analyzed data. Advised first year graduate students on research and writing of Master's theses.

Research Assistant, "Adolescent Body Politics: Collective Discourse, Body Concept, and Menstruation," Laura Fingerson, Principal Investigator, 2000.
Department of Sociology, Indiana University - Bloomington
> Conducted focus group and individual interviews.

ADMINSTRATIVE EXPERIENCE

Data Resource Analyst, 2005
Office of the Assistant Provost for Academic Services, Michigan State University
> Queried, analyzed, and reported on data related to the Offices of Admissions, Financial Aid, and the Registrar. Advised and supported staff on issues related to data collection and analysis. Proposed, conducted, and report on analysis projects that identify issues related to department operations and student success.

Assistant Coordinator for Conference Programs, 1996-1998
Sargent Center for Outdoor Education, Boston University
> Coordinated program development, administration, and evaluation of student leadership, adventure-based teambuilding, outdoor recreation, conference, and retreat programs for New England colleges, businesses, and community groups. Managed reservations, contracting, and preparations of Center facilities. Trained, supervised and evaluated two full-time and 25 part-time staff. Acted as a group facilitator, ropes-course leader, and supervisor of all low-elements.

Assistant Director of Campus Activities/Resident Director, 1994-1996
Office of Student Life, LeMoyne College
> *Campus Activities*: Coordinated a four-year Student Leadership Development Program. Advised budget and programming activities of student clubs and organizations, including the LeMoyne Student Programming Board and the Student Senate. Organized and implemented campus-wide educational and social programming.

> *Residence Life*: Managed and maintained all aspects of a residential area of approximately 200 residents, including administration, facilities, budgeting, staffing, and programming. Supervised 5-8 Resident Assistants and two part-time office assistants. Provided personal and academic counseling for residents. Organized and implemented social, recreational, educational, and multicultural programs. Assisted with the housing lottery, as well as staff selection and training.

Resident Director, 1991-1992
Office of Residence Life, Mount Ida College
> Managed and maintained all aspects of a 350 person residence hall. Provided residents with personal and academic counseling. Coordinated and implemented social and educational programming. Mediated in disciplinary hearings. Assisted with the selection and training of Resident Assistants.

PROFESSIONAL SERVICE

Strategic Planning Committee, Office of the Chancellor, Indiana University - Bloomington, 2002-2003
Personnel Committee, Department of Sociology, Indiana University – Bloomington, 2002-2003
Graduate Mentoring Committee, Department of Sociology, Indiana University – Bloomington, 2002-2003
Committee for Fee Review, Campus Life Division, Indiana University – Bloomington, 2001
Student Recruitment Committee, Department of Sociology, Indiana University – Bloomington, 2000-2002
Graduate Affairs Committee, Department of Sociology, Indiana University – Bloomington, 2000-2001

PROFESSIONAL ASSOCIATIONS

American Sociological Association (ASA)
Assoc. for the Study of Higher Education (ASHE)

COMMUNITY SERVICE

Alumni Admissions Counsel, Brandeis University, 1994-present
Religious Education Instructor, All Souls Community Church, Grand Rapids, 2006-2007
Board Member, Bread for the Journey of Bloomington, 1999-2003
Habitat for Humanity, W. Virginia, New York, California and Indiana Chapters, 1995-2003
Boston->New York AIDS Ride, National AIDS Rides, 1998