NEVER QUITE GOOD ENOUGH:

THE PARADOX OF STICKY DEVELOPMENTAL RELATIONSHIPS FOR ELITE UNIVERSITY GRADUATES

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Accepted for publication in *Journal of Vocational Behavior*

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Abstract

Drawing on the mentoring, education, and social psychology literatures, this longitudinal study examines how the persistence of developmental relationships from an elite graduate school influences subjective career outcomes during early career. Participants (n=136) were surveyed about their developmental networks—a group of individuals who take an active interest in and action to advance a focal individual's career—and subjective career outcomes over the ten years (1996-2006) post graduation. Results show that although receiving mentoring from one's entire developmental network was positively related to career-related self-efficacy and perceptions of career success, this was not the case for ties retained from graduate school. Continuing to receive mentoring support from developers from graduate school and further, from peers from graduate school, was negatively related to perceptions of career success. These findings offer insight into the dynamics and potentially negative consequences of developmental networks and highlight the significance of social comparison during early career.

Keywords

Mentoring, education, developmental networks, psychology, social comparison theory, longitudinal, multilevel modeling

1. Introduction

Research has shown that mentoring is related to a variety of protégé career outcomes, including higher rates of promotion, total compensation (Whitely, Dougherty, & Dreher, 1991) and career satisfaction (Fagenson, 1989). In most mentoring research, the primary mechanism accounting for the effects observed is the amount of mentoring support provided by a "mentor" – a senior, more experienced person within one's place of work (Kram, 1985). Recently, research has examined mentoring provided by a variety of sources – that is, by a "developmental network" (Higgins & Kram, 2001). This new stream of research reflects Kram's (1985) original notion that "constellations" of individuals provide mentoring. A developmental network perspective opens the inquiry in mentoring research to consider not just the amount and quality of help received but also the kinds of relationships that provide such support.

In the present research, we focus on this new conceptualization of mentoring and examine how protégé developmental networks impact two protégé outcomes: career-related self-efficacy and perceptions of career success. These two outcomes have been associated with organizational commitment, work satisfaction, health, and well-being (e.g., Etzion, 1988; Scarpello & Vandenberg, 1992). In addition, this focus is in line with recent calls in organizational research to examine subjective career outcomes. Examining subjective career outcomes allows us to transcend assumptions about careers that may no longer hold true – for example, that careers necessarily progress in an upward or predictable fashion. The present work thus differs from prior longitudinal research on developmental networks (e.g., Higgins & Thomas, 2001), in which participants worked in firms of similar size, status, and location and so, had objective standards regarding outcomes such as "career advancement."

In this study, we focus on an important and yet understudied source of mentoring:

relationships that were formed during graduate school. Research on mentoring has long suggested that a pivotal time in one's adult development is early career (e.g., Levinson, 1986), which may include graduate school. Education scholars have found that this is a formative time in an individual's professional development (Kegan, 1982) and that school-based relationships can have a powerful impact on the quality of one's education (e.g., Light, 2001). However, there is a dearth of education research on the impact that relationships that originated in graduate school have beyond school, and there is no education research, to our knowledge, on developmental networks. Despite the substantial research on and calls for improved mentoring between faculty and students in the education literature (e.g., Tenenbaum, Crosby, & Gliner, 2001), we know very little about the long-term value of education-derived relationships.

Here, we focus squarely on this issue and examine whether developmental relationships formed during graduate school have a lasting impact on how confident and successful one feels during early career. We draw upon ten years of longitudinal data from a cohort of MBAs (n=136) who all graduated from the same elite graduate business school in 1996. We tracked both the relationships that comprised each participant's developmental network as well as participants' career beliefs and attitudes. Since we tracked the nature of the help provided, we were able to assess whether the amount of support impacts protégé career outcomes, thus moving beyond purely structural explanations to account for the quality of mentoring support as well.

We begin our investigation by examining the effects of the amount of mentoring provided by one's entire developmental network on career-related self-efficacy and perceptions of career success. We then explore subsets of relationships that make up these developmental networks. First, we consider whether ties retained from graduate school impact protégés' subjective career outcomes during early career. Second, we examine whether ties to *peers* from

graduate school influence these outcomes. In order to understand the influence of such "sticky" ties from graduate school, we draw heavily upon the education literature, whereas to understand the influence of peers, we draw heavily upon research in social psychology such as studies of social comparison. Taken together, these three streams of research – mentoring, education, and social psychology – provide an interdisciplinary perspective and greatly informed our thinking.

Since developmental networks may be comprised of relationships that come from inside or outside of one's place of employment and may span hierarchical levels, we refrain from using the word "mentor" in this research. We use the term "developer" for the individuals who comprise our participants' "developmental networks" (c.f., Higgins and Kram, 2001) and the term "mentoring" to refer to the general nature of the help these developers provide. Further, since both of our outcome measures are career–related, we focus on one particular type of mentoring support, career-related mentoring, when examining the amount and kind of mentoring provided. Other kinds of help, such as psychosocial support, might be more relevant for outcomes such as emotional well-being (e.g., Tharenou, 2005).

2. Theoretical Background and Hypotheses Development

2.1. Developmental Networks and Career-Related Self-Efficacy

Social psychologists find that perceived self-efficacy—defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3)—is critical for career development (Bandura, 1997, p. 427) and for factors such as persistence, steadfastness, or the pursuit of certain paths. Much of the original work on self-efficacy focused on student achievement in academic settings and on the role of social relations at school (see Lent, Lopez, Bieschke, & Socall, 1991). Building on this work, organizational scholars have studied "career-related self-efficacy," which refers to the extent to

which individuals believe that they are able to successfully manage their careers (Day & Allen, 2004). Like Bandura's (1997) concept of self-efficacy, career-related self-efficacy is prospective or forward-facing and concerns beliefs one has about one's potential in the future. Recently, management scholars have asserted that "the nature of support – the way relationships at work may affect a manager's self-efficacy has been under-researched" (Jaina & Tyson, 2004, p. 276).

Yet this has not been the case in mentoring research. Beginning with Kram (1985), mentoring scholars have found that career-related mentoring such as coaching, exposure, and visibility can help protégés acquire important skills that make them feel more optimistic and confident about their careers (Kram, 1985, p. 54-55). In a recent study, Lankau and Scandura (2002) examined specific linkages between the amount and kind of support provided, protégé learning, and work attitudes. They found support for the relationship between vocational (or career-related) mentoring and personal learning at work: people who experience greater learning at work feel more positively overall about work and have greater confidence regarding work-related problems. With respect to developmental networks, we expect that a similar logic will hold: individuals who have high-quality developmental relationships—as indicated by a higher amount of career-related help received—will experience greater confidence in their career-related prospects for the future:

H1: During early career, the greater the career support one receives from one's entire developmental network, the greater one's career-related self-efficacy.

2.2. Developmental Networks and Perceived Career Success

"Subjective career success is defined by an individual's reactions to his or her unfolding career experiences" (Heslin, 2005, p. 114). Studies of subjective career success often focus on self-referent criteria such as personal standards or goals. In addition, "success" may reflect the expectations of others. For example, Lawrence (1984) measured whether or not individuals felt

on schedule, ahead of schedule, or behind schedule relative to others. In addition, Turban and Dougherty (1994) measured perceived career success based on what individuals thought others, such as co-workers, believed was "successful."

In the present study, we examine perceptions of career success by considering both self- and other-referent criteria. From this perspective, advice from one's network of developers has the potential to greatly impact perceptions of success. As prior social networks research suggests, networks are not just pipes of information, resources, and access; they may also provide a "prism" through which to see one's world (Podolny, 2001). Here, we focus specifically on the amount of career help received and how such help relates to perceptions of career success during early career.

Studies in education and business have shown that individuals receive mentoring support when they show potential (e.g., Allen, Poteet, & Russell, 2000). For example, research on mentoring in education has shown that students who enter programs having demonstrated potential through indicators such as higher GRE scores receive greater amounts of career mentoring than those with lower scores (Green & Bauer, 1995). We expect that protégés who receive career-related mentoring such as exposure, visibility, and protection will similarly feel that they have demonstrated potential, and thus have positive perceptions of career success. In addition, through career-related mentoring, individuals are likely to experience personal learning, which, as Lankau and Scandura (2002) suggest, may lead to more positive attitudes about work overall. These attitudes may include positive views about skills and knowledge acquired, which may enhance one's evaluation of career success thus far:

H2: During early career, the greater the career support one receives from one's entire developmental network, the greater one's perceptions of career success.

2.3. Graduate School Developmental Relationships and Career-Related Self-Efficacy

One of the benefits of incorporating social network research into the study of mentoring is the opportunity to examine how certain types of relationships affect protégé career outcomes (Higgins and Kram, 2001). Here, we unravel protégés' developmental networks to consider the subset of the developmental network comprised of relationships from graduate school: these relationships may be with professors, peers, or staff, and we consider all of these categories together first in this section. Later, we consider only peer relationships from graduate school.

In the education literature on mentoring, there is both indirect and direct evidence to suggest that mentoring and self-efficacy will be positively related during early career. Studies show that mentoring support increases student opportunities to improve skills and knowledge that are valuable to one's future career (see Ehrich, Hansford, & Tennent, 2004, for a review). This learning, in turn, may increase graduates' confidence in their future careers. More directly, research on mentoring in education has examined linkages between certain kinds of mentoring and self-efficacy, although not in a longitudinal design. For example, research shows that students build greater confidence in themselves as a result of role modeling mentors (Erkut & Mokros, 1984). In a similar fashion, we expect that career-related mentoring from developers from graduate school will influence perceptions of career-related self-efficacy. Such help provides exposure and visibility that should enhance students' confidence about their careers:

H3: During early career, the more career support one receives from developers from one's elite graduate school, the greater one's career-related self-efficacy.

2.4. Graduate School Developmental Relationships and Perceptions of Career Success

Unlike career-related self-efficacy, which is a prospective concept, perceptions of career success reflect an evaluation of what one has accomplished thus far (Heslin, 2005). This opens up the possibility for tension— that one could feel confident regarding one's future while not yet satisfied with one's success thus far. Further, since perceptions of career success may include

other-referent criteria, one could feel confident and at the same time, not yet successful due, in part, to others' high expectations. As Heslin's (2005) recent review of literature on career success suggests, individuals often try to balance two feelings: that of "feeling successful" with that of "becoming successful." Similarly, we propose that receiving career-related mentoring from developers from graduate school may enhance career-related self-efficacy while, at the same time, leave one feeling less successful in one's career thus far.

Support for this notion of tension also derives from research conducted in social psychology in the context of education. Studies show that children's self-concept is largely determined by their academic context. Research over the last three decades by Marsh and his colleagues on the "Big Fish Little Pond Effect" (BFLPE) shows that students who are equally able develop lower academic self-concepts when placed in high-academic ability schools than when placed in low-academic ability schools (Marsh & Hau, 2003). Much of this work has focused on the effects of shifting from an academic context in which one was top of the class (i.e., a "big fish") to a higher-ability "pond" in which there are many other "big fish," which can dampen one's self-concept (Marsh, 1984). Grounding this work is the notion that individuals' self-views are based upon evaluations of similar others (Dai, 2004).

In the present study, we expect that maintaining ties to a high-ability academic environment such as an elite business school during early career will continue this comparison process and may negatively impact perceptions of career success. Scholars have long suggested that evaluation of criteria is done in the context of a frame of reference (James, 1890/1963). Here, receiving help from a developmental network composed of developers from an intense academic environment in which expectations were very high is likely to serve as an important frame for evaluating one's career success. To the extent that an individual maintains such ties

over the course of one's early career, this high-academic frame and resultant comparison process is likely to continue. Much like the BFLPE, we expect graduates to downgrade the amount of success they feel they have had in their careers if they continue to receive substantial career-related mentoring from developers from this elite academic context:

H4: During early career, the more career support one receives from developers from one's elite graduate school, the lower one's perceptions of career success.

2.5. Peer Developers from Graduate School and Career-Related Self-Efficacy

Over the years, social psychologists have debated the question of what determines whether self-views are affected by "superstar" individuals (e.g., high academic-achieving) (e.g., Lockwood & Kunda, 1997). In the present context, peer developers from one's elite graduate school may indeed seem like "superstars" to protégés, or at a minimum as possessing a high level of professional abilities. Since these developers are peers from graduate school, they are similar to the protégé, at least from a social structural perspective, and so, likely affect the protégé's self-views. As social comparison research finds, people are likely to socially compare with individuals they find similar to themselves (Festinger, 1954).

Moreover, research shows that the closer individuals feel to one another, the greater the likelihood for social comparison (Tesser, 1988). Here, since protégés and their peer developers went through similar experiences together at graduate school, they likely share similar systems of meaning (Duck, 1994) and so, feel psychologically similar to one another. As empirical research on work relationships finds, those who feel psychologically similar to one another are more likely to influence one another's self perceptions (Jaina & Tyson, 2004).

Although there is considerable debate in the literature as to the directional effects of such comparison – whether the result will be a positive or negative self-view – the evidence suggests a positive relationship with respect to *future-oriented* assessments. For example, Tesser's (1988)

theory of reflection and Cialdini and colleagues' (1976) theory of basking in reflected glory both account for mechanisms through which an individual is positively impacted by the triumphs of close comparison others. Individuals imagine possible future selves, which can have a positive impact on one's own aspirations (Markus & Nurius, 1986). These positive views of the self derive not from one's sense of personal achievement but rather from the sense that "I belong to a wonderful group" (Lockwood & Kunda, 1997). We propose that receiving career support from a network of peer developers from graduate school will foster a sense of belonging to a "wonderful group," thus increasing one's career-related self-efficacy:

H5: During early career, the more career support one receives from peer developers from one's elite graduate school, the greater one's career-related self-efficacy.

2.5. Peer Developers from Graduate School and Perceptions of Career Success

At the same time, we expect that receiving career support from peer developers from graduate school may negatively impact perceptions of career success. Indeed, social comparison research has found considerable evidence for the negative effects of upward comparison processes (e.g., Wills, 1981). These mentoring relationships are likely to lead to upward social comparisons because these peers, having been identified as developers, have skills or knowledge the focal individual has not yet attained. Though inspiring, such upward comparisons and mentoring may also reveal areas in which the protégé lacks relevant knowledge or skill.

Research on "superstar" social comparison others shows that individuals' self-views may be impacted positively or negatively or even both simultaneously (Lockwood & Kunda, 1997). For example, "the realization that one is currently less successful than another may lose its sting if it is accompanied by the belief that one will attain comparable success in the future" (Lockwood & Kunda, 1997, p. 93). Here, receiving mentoring support from peers may enhance one's self-efficacy and yet, given the social psychological processes of upward social

comparison, may also highlight deficiencies, thus deflating perceptions of career success:

H6: During early career, the more career support one receives from peer developers from one's elite graduate school, the lower one's perceptions of career success.

3. Methods

3.1. Sample and Procedure

Participants in this longitudinal study were students in a top-twenty United States East Coast full-time MBA program. Data were collected at four points in time, spanning ten years (1996-2006). The first data collection ("Baseline") occurred before graduation in Spring 1996.[1] All participants from the baseline sample of 136 individuals were invited to complete the first follow-up survey approximately two years later in 1998 ("Time 1"). The response rate for this survey was 79% (n=108). For the third survey ("Time 2"), which occurred five years after graduation in 2001, all participants from the base sample were contacted to participate regardless of whether they had completed the Time 1 survey or not. The response rate was 64% (n=87). The fourth data collection ("Time 3") occurred in 2006, ten years after graduation. Again, all participants from the baseline sample were contacted to participate, regardless of whether they responded at Times 2 or 3. The response rate was 57% (n=77). A total of 408 surveys were collected across the four timepoints of the study.

Given the substantive difference between student (Baseline) and professional (Times 1, 2, and 3) networks and the focus of this study on career beliefs and attitudes, our analyses included developmental network and career outcome measures only from the time periods when participants had rejoined the workforce. In the sections that follow, we present descriptive data and results from these three time periods, Times 1, 2, and 3, only. The surveys included

[1] Of the 136 initial participants, 67 completed the 1.5 hour long survey during a group meeting (out of 87 in attendance; 77% response rate) and 69 completed the survey via mail (out of a random sample of 300; 23% response rate). There were no statistically significant differences between the two subsets of the baseline sample with respect to any of the main variables of interest, and thus the two subsets were combined.

measures to test Hypotheses 1 through 6 and items regarding participants' lives and careers. Estimated means, standard deviations, and correlations for all measures are shown in Table 1.

Insert Table 1 about here

3.2. Developmental Network Measures.

On each survey, participants provided information about their *current* developmental network. Specifically, participants responded to a name generator question: "Please consider the people who you believe currently—i.e., some time over the last year—take an active interest in and concerted action to advance your career… they may be people with whom you work or have worked, friends, or family members…. and they may assist you with personal as well as professional development" Consistent with prior research, this question typically generated between four and five developers (Higgins, 2001a). This question was asked independently at each time point (i.e., participants were not prompted with names mentioned in previous surveys). For each developer named within a participant's developmental network, which totaled over 800 relationships across the sample, participants answered a variety of questions, including the type and amount of help provided by the developer, the hierarchical relationship of the developer (e.g., superior), and the origin of the mentoring relationship (e.g., school, community, etc.). In sum, our dataset includes information on each participant's developmental network at each time period in which the participant responded.[2] Longitudinal network studies such as this are quite rare, particularly over a time period as long as ten years.

The developmental network measures of interest are the extent to which participants received career support from (a) their entire developmental network, (b) developers from their elite graduate school, and (c) peer developers from their elite graduate school. To measure

[2] Analyses of the dynamics of the specific relationships named in these networks are reported elsewhere (see Cummings & Higgins, 2005).

career support, participants indicated the extent to which each developer provided support such as the following: "creates opportunities for visibility for you," "opens doors for you professionally," and "frequently acts as a sponsor for you" (where 1=never; not at all to 7=to the maximum extent possible). The five items used in this research are consistent with Kram's (1985) seminal mentoring research and with subsequent empirical research on mentoring (e.g., Dreher & Ash, 1990) and developmental networks (e.g., Higgins & Thomas, 2001).

Career Help from One's Entire Developmental Network. We assessed the amount of career help participants received from their *entire* developmental network by taking the average of the amount of career support from all developers in their networks. Although using two variables in our models, one for network size and one for total amount of career help for the entire developmental network, would have been appropriate from a conceptual perspective, technically, it would have resulted in biased parameter estimates since both variables are based upon the same numbers of developers. Therefore, consistent with prior research, we controlled for developmental network size in all of our models, and, when considering the *entire* developmental network, we calculated an average for the variable "amount of career help" (see Higgins & Thomas, 2001: 233)[3]. The average for this measure was 3.94 (S.D.=1.38) at Time 1, 4.03 (S.D.=1.25) at Time 2, and 4.08 (S.D.=1.42) at Time 3.

Career Help from Developers from One's Elite Graduate School. Participants were asked to identify the social arena that best described how they knew each developer and were provided with social arenas from which to choose, including: "education-'elite graduate school,'" "education-not 'elite graduate school,'" "previous employer," "current employer," and so on. This strategy of asking participants to identify the social arena in which they know

[3] "Career help from developers from graduate school" and "career help from peer developers from graduate school" are based on subsets of the entire network in which this concern for biased estimates is not applicable; therefore, we use the total amount (sum) of career support rather than the mean for these measures.

someone in their network has been used in prior research (e.g., Higgins, 2001; see Burt, 1983, for a methodological discussion of network range). Since it is possible that participants knew their developers from more than one social arena (e.g., graduate school and a previous employer), we asked participants to name the relationship that "best describes" how they knew each developer. To the extent that there were such dual affiliations in our dataset, we expect our measures involving relationships from graduate school are conservative.

The amount of career help participants received from developers from their graduate school was calculated as the total amount of career support participants received from all developers in the network who were coded as being from graduate school (i.e., developers who were coded as being from "education-'elite graduate school'"). The number of developers from graduate school in participants' networks ranged from 0 to 4 at Time 1, and from 0 to 2 at both Times 3 and 4. The average amount of career help received by participants from their graduate school developers was 2.12 (S.D.=3.39; range 0 to 18) at Time 1, 1.64 (S.D.=2.81; range 0 to 12.2) at Time 2, and 1.43 (S.D.=2.77; range 0 to 13.2) at Time 3.

Career Help from Peer Developers from One's Elite Graduate School. Participants were asked to indicate whether they would consider each person they named to be a "superior," "peer," or "subordinate." Again, participants were told to do their best to select one category. Therefore, "peers from graduate school" was based upon a logic calculation: peer graduate school developers were those the participants indicated were both developers they knew from graduate school and also peers (vs. superiors from graduate school such as professors). We note that this may also be a conservative number: for example, if family members (i.e., spouses who were former peers from graduate school) were not coded as "peers," but were "n/a," we may again have a conservative estimate.

The amount of career help participants received from peer developers from their graduate school was calculated as the total amount of career support participants received from all developers in the network who were coded as being both a peer and from graduate school. The number of developers who were graduate school peers in participants' networks ranged from 0 to 4 at Time 1, and from 0 to 2 at both Times 3 and 4. The average amount of career help received by participants from their peer graduate school developers was 1.68 (S.D.=3.06; range 0 to 18) at Time 1, 1.19 (S.D.=2.17; range 0 to 8.8) at Time 2, and .96 (S.D.=1.99; range 0 to 7).

3.3. Career Outcome Measures

We examined two career outcomes: career-related self-efficacy and perceptions of career success.[4] Both constructs were measured at each time period of the study.

Career-Related Self-Efficacy. The career-related self-efficacy items in this study came from Bandura's (1977) original work on self-efficacy and were tailored slightly to reflect confidence in one's career, as opposed to confidence in a particular task, for example. Participants indicated their degree of agreement (on a 7-point scale, where 1=disagree completely to 7=agree completely) with five items, including: "When I make career decisions, I am confident that they are good ones," "I am confident in my ability to grow and improve professionally," and "I seem capable of dealing with most problems that come up in my career." We averaged the five items to create a score for career-related self-efficacy, and then multiplied it by 1000 to aid in the interpretation of the analyses' parameter estimates (Time 1: M=5908.33, S.D.=828.48, alpha =.86; Time 2: M=5793.10, S.D.=690.43, alpha =.82; Time 3: M=5778.17, S.D.=816.86; alpha =.86). Higher scores indicate higher career-related self-efficacy.

[4] Factor analyses (using principal axis factoring with promax rotation) of all items included in the career-related self-efficacy and perceptions of career success scales reveal that these two constructs are empirically distinct; all career-related self-efficacy items loaded onto one factor and all perceptions of career success items loaded onto a second factor at each time period of the study. Together, the two factors explained 65.0, 64.4, and 69.2 percent of the variance at Times 2, 3, and 4, respectively.

Perceived Career Success. Perceived career success was measured using four items employed in prior mentoring and careers research by Turban and Dougherty (1994). Specifically, using a 7-point scale (1=not at all successful to 7=completely successful), participants indicated their beliefs about their degree of career success for the following three items: "How successful my career has been," "Compared to the people I consider to be my peers, how successful my career has been," and "How successful my family and 'significant others' believe my career has been." The fourth item asked participants: "For a person my age, I think that my career is: behind schedule (1), on schedule (2), or ahead of schedule (3)."

Because the first three items used a different scale (7-point) than the fourth item (3-point), all items were z-scored, averaged to create a single score for perceptions of career success, and then multiplied by 1000 to aid in the interpretation of the parameter estimates (Time 1: M=-6.26, S.D.=791.80, alpha =.69; Time 2: M=0.00, S.D.=816.90, alpha =.83; Time 3: M=-.56, S.D.=831.53; alpha =.86). Higher scores indicate a perception that one has been more successful. Prior to z-scoring the perceptions of career success items (and multiplying by 1000), the means of the three 7-point scale items were 5.59, 5.30, and 5.39 for Times 1, 2, and 3, which show that participants felt positive about their level of career success. The means for the 3-point scale item over time were 2.25, 2.17, and 2.08 (where 3=ahead of schedule, 2=on schedule, and 1=behind schedule), suggesting that participants felt approximately on schedule.

3.4. Controls

Consistent with prior research on developmental networks (e.g., Dobrow & Higgins, 2005; Higgins & Thomas, 2001), we controlled for three individual-level factors in our analyses: gender (72% male), ethnicity (77% Caucasian), and socioeconomic status (SES). For SES, participants indicated their parents' combined income on an 8-point scale, from 1=less than

$20,000 to 8=greater than $200,000. Participants' mean of 5.69 (S.D.=2.36) places them between $80,001-100,000 (5 on the scale) and $100,001-150,000 (6 on the scale). We controlled for developmental network size at each time period. Participants had an average of 4.06 (S.D.=1.24) developers at Time 1, 3.82 (S.D.=1.40) at Time 2, and 3.51 (S.D.=1.46) at Time 3.

3.5. Statistical Analyses

We fit a taxonomy of multilevel models (Singer & Willett, 2003) to address our questions about levels of career-related self-efficacy and perceptions of career success during early career[5]. Multilevel models are explicitly designed to handle the non-independence among the multiple observations over time that are the basis for a longitudinal study such as ours. Further, since ours is a theory about *levels* (e.g., amount of career help and amount of career-related self-efficacy during early career), rather than about *rates of change*, our interest focuses more on the *intercepts* of the multilevel models and less on the *slopes*. In this way, we were able to examine the relative levels of our outcomes over time, while taking advantage of the increased power that results from having multiple measures over time.

One typical use of multilevel models is to examine data on individuals nested within groups (e.g., employees within companies). In our analyses, in contrast, the lower level of measurement ("level-1") is the *wave of data collection* and the upper level ("level-2") is the *individual.* The multilevel model we fit is specified in two stages. At level-1, we postulate a linear model that describes the relationship between time (i.e., wave of data collection) and each outcome. This gives rise to two level-1 parameters: an intercept and a slope. (See Section 3.6 for specifics of our models.) At level-2, we postulate a linked pair of models—one for the level-1 intercepts and another for the level-1 slopes—that describe the relationship between these

[5] Specifically, we fit multilevel models with both random intercepts and slopes for time, using SPSS's mixed procedure. We replicated the analyses using a simpler random intercepts model, and the results for our substantive predictors were identical.

parameters and person-specific predictors (e.g., gender). One major advantage of multilevel models is that they can also easily accommodate time-varying predictors—such as our developmental network measures.

Multilevel modeling is ideally suited for examining the variability in our two outcomes over time for several reasons: it takes advantage of the multiple measures we collected at Times 1, 2, and 3. This results in a much more accurate representation of "true" underlying levels of the outcomes during this career phase than would a single measure (Singer & Willett, 2003). Further, the technique is much more flexible than traditional repeated measures analysis of variance as it does not require "balanced" data – that is, the same number of waves of data for each person (Singer & Willett, 2003). Rather, all available waves of data from each individual are included and no imputation for missing data is needed (Singer & Willett, 2003).

In our dataset, of the 136 Baseline participants in the study, 115 individuals provided data for at least one of the Times 1, 2, or 3 surveys. Specifically, these 115 individuals completed a total of 248 surveys across the three time periods, resulting in an average of 2.16 surveys per person over the course of the study. Whereas alternative modeling methods that require balanced data would have included only 50 individuals from our dataset, multilevel modeling allowed us to take full advantage of the data provided by 115 participants. Thus, while a variety of statistical approaches could be used for analyzing longitudinal data, multilevel modeling is the most appropriate technique for our data and our research questions about *levels* of career-related self-efficacy and perceptions of career success during early career.

3.6. Models

We estimated five multilevel models for each of our two outcome variables (per Singer & Willett, 2003) (see Tables 2 and 3):

(1) An unconditional means model, a baseline model with no predictor variables (Table 2, Model 1A and Table 3, Model 1B). The fitted equation[6] for this model is:

$$\hat{C}\text{areer Outcome}_{it} = \hat{\beta}_{00}$$

where $\hat{C}\text{areer Outcome}_{it}$ is the predicted value of the outcome variable (career-related self-efficacy or perceptions of career success) for Person_i at YEAR_t and $\hat{\beta}_{00}$ is the estimated population overall average.

(2) An unconditional linear growth model, a second baseline model in which TIME serves as the only predictor (Table 2, Model 2A and Table 3, Model 2B). The level-1 and level-2 models for this and all subsequent models can be combined into a composite model, which is useful for interpretation:

$$\hat{C}\text{areer Outcome}_{it} = \hat{\beta}_{00} + \hat{\beta}_{10}(\text{YEAR}_{it}\text{-}5.5)$$

Here, $\hat{\beta}_{00}$ is the estimated intercept (the estimated value of the outcome when the predictor (YEAR_{it}-5.5)= 0) and $\hat{\beta}_{10}$ is the slope coefficient that quantifies the estimated amount of change in the outcome per year. We centered YEAR at Time 2 (e.g., so that Time 2, 5.5 years into this 10-year study, corresponds to the intercept), which occurred at the approximate midpoint between participants' graduation from business school (Baseline) and the final data collection in this study (Time 3). With this approach, the intercept parameter tells us about our core interest: the average *levels* of the outcomes during participants' early careers.

(3), (4), and (5) Full models for each hypothesis including all predictors (see Table 2, Models 3A-5A and Table 3, Models 3B-5B). The focal predictor in these full models was the amount of career support provided by the entire developmental network in Models 3A and 3B, the amount of career support provided by developers from one's graduate school in Models 4A

[6] Fitted equations do not include error terms, in contrast to non-fitted equations.

and 4B, and the amount of career support provided by peer developers from one's graduate school in Models 5A and 5B. The same set of controls was included in all of these models (Models 3A-5A and 3B-5B): gender, ethnicity, socioeconomic status, and developmental network size (for each time period), as well as the time variable, YEAR. Just as in multiple regression models, the direction, size, and significance of variables' relationships to the career outcomes are reflected in their parameter estimates, standard errors, and corresponding p-values. We focus on the main effects of these predictors on levels of the outcome. The fitted full model equation is:

$$\hat{C}\text{areer Outcome}_{it} = \hat{\beta}_{00} + \hat{\beta}_{01}\text{Gender} + \hat{\beta}_{02}\,\text{Ethnicity} + \hat{\beta}_{03}\,\text{SES} + \hat{\beta}_{20}\,\text{Number of Developers}_{it} + \hat{\beta}_{30}\,\text{Career Support}_{it} + \hat{\beta}_{10}(\text{YEAR}_{it}\text{-}5.5)$$

$\hat{\beta}_{01}$, $\hat{\beta}_{02,}$ and $\hat{\beta}_{03}$ are the estimated coefficients for Gender, Ethnicity, and SES, respectively, $\hat{\beta}_{20}$ is the estimated coefficient for the Number of Developers for Person_i at $\text{YEAR}_{t,}$ and $\hat{\beta}_{30}$ is the estimated coefficient for the focal career support variable for Person_i at YEAR_t.

4. Results

Descriptive statistics for all variables in these analyses are reported in Table 1. In general, the control variables were not significantly associated with the outcome variables.[7]

Insert Tables 2 and 3 about here

4.1. Full Models

Career Help from One's Entire Developmental Network. Hypothesis 1 predicted a positive relationship between the amount of career help participants received from their entire developmental network and levels of career-related self-efficacy during early career, and our results supported this prediction ($\hat{\beta}$=106.78, p≤.001; see Table 2, Model 3A). Hypothesis 2 also

[7] The exception was ethnicity. It was significantly associated with perceptions of career success in Models 3B, 4B, and 5B, such that being Caucasian was associated with higher perceptions of success over time.

predicted a positive relationship between the amount of career help participants received from their entire developmental network and levels of perceptions of career success during early career; again, our results supported this prediction ($\hat{\beta}$=91.23, p≤.01; see Table 3, Model 3B).

Career Help from Developers from One's Elite Graduate School. Hypothesis 3 predicted that the amount of career help received from developers from graduate school would be positively associated with levels of career-related self-efficacy during early career. Our analyses did not support this prediction (see Table 2, Model 4A). Hypothesis 4 predicted that the amount of career help received from developers from graduate school would be negatively associated with perceptions of career success. Our results supported this prediction ($\hat{\beta}$=-47.34, p=.002; see Table 3, Model 4B).

Career Help from Peer Developers from One's Elite Graduate School. Hypothesis 5 predicted that the amount of career help received from peer developers from graduate school would be positively associated with levels of career-related self-efficacy during early career. Our analyses did not support this prediction (see Table 2, Model 5A). Hypothesis 6 predicted that the amount of career help received from peer developers from graduate school would be negatively associated with levels of perceptions of career success during early career. Our results supported this prediction ($\hat{\beta}$=-81.14, p<.001; see Table 3, Model 5B).

Goodness of Fit. Model fit statistics are summarized in Tables 2 and 3. Comparisons revealed significant differences in the fit of the full models for all hypotheses relative to the fit of their associated unconditional means and unconditional growth models. Overall, these results indicate that the developmental network variables (see Table 2, Models 3A-5A and Table 3, Models 3B-5B) made significant contributions to model fit.

5. Discussion

This research focused on the role of early-career developmental networks in shaping two subjective career outcomes: protégé career-related self-efficacy and perceptions of career success. We found a positive relationship between the amount of career help provided by an individual's entire developmental network and career-related self-efficacy and perceptions of career success during early career. With respect to the subnetwork comprised of developmental relationships from graduate school, we had expected to find that individuals experience both positive and negative perceptions simultaneously. Specifically, although maintaining such ties may engender feelings of belonging to a "wonderful group" (Lockwood & Kunda, 1997) and a sense of possibility regarding one's future, thereby enhancing career-related self-efficacy, receiving help from these individuals may also remind one of the high expectations associated with this group, thus deflating perceptions of career success thus far. We expected to find a similar tension associated with mentoring from peer developers from graduate school.

Yet, this is not exactly what we found. Certainly, on an absolute level, the results for career-related self-efficacy and perceptions of career success appear "high" for this sample (e.g., with means between 5 and 6 on a 7-point scale). However, amount of career support provided by developers from graduate school was not related to career-related self-efficacy, counter to our expectations. Amount of career support from these developers was negatively associated with perceptions of career success, and the same was true for peer developers from graduate school. Thus, regarding perceptions of career success, there were only negative effects associated with sticky ties from graduate school. These results suggest that receiving help from these kinds of developers may lead to more negative than positive processes of social comparison.

This research has several implications for research. First, our findings suggest that extraorganizational mentoring can play a significant role in shaping individuals' careers during

early career. In both the organizational and educational literatures, scholars have generally focused on how intraorganizational mentoring, whether in an employment setting (e.g., Eby, Durley, Evans, & Ragins, 2006; Kram,1985) or a school setting (e.g., Hardy, 1999), affects protégé careers. A few organizational studies have begun to investigate extraorganizational relationships and even then, these have not been done in a rigorous, multi-wave longitudinal fashion; rather, the focus has been on examining developmental networks at one point in time and their effects at another (e.g, Higgins & Thomas, 2001). This study also contributes to mentoring research in education, which has not, to our knowledge, examined mentoring beyond traditional dyadic, intraorganizational, hierarchical mentoring relationships.

The present research also extends prior research on multiple mentoring by considering the content as well as the structure of developmental networks and their influence on protégé career outcomes. This differs from much of the work on developmental networks, which has examined network structure but not the content of help provided (e.g., Dobrow & Higgins, 2005). In addition, this research extends prior mentoring research by drawing upon social comparison theory. Although prior mentoring research has long suggested that mentors offer support in the form of "role-modeling" and more instrumental forms of help, such as exposure and visibility (Pellegrini & Scandura, 2005), rarely has social comparison been the focus of mentoring studies. Similarly, educational studies tend to focus on career support such as skill development (e.g., Ehrich, Hansford, & Tennent, 2004; for an exception see, Erkut & Mokros, 1984 on role models). By focusing on both the amount of career support and the source of the mentoring support, we open up the possibility for new mechanisms, such as social comparison, not previously considered in the mentoring literature (for an exception, see Higgins, 2001b).

The present study also contributes to the growing research on negative mentoring. Prior

studies have found that mentoring can lead to negative outcomes for protégés such as sabotage or deception (e.g., Scandura, 1998). Yet studies of unintended consequences of mentoring in which having a developmental relationship (or set of relationships) undermines what are otherwise positive protégé career outcomes, such as career-related self-efficacy, are rare. In addition, the present research extends prior work by focusing on protégé career beliefs and attitudes – that is, the subjective side of one's career. Despite the recent calls for research in organizational behavior and psychology to highlight positive connections at work (e.g., Dutton, 2003), mentoring research has yet to fully engage in this dialogue. The present study takes a step in this new direction and, with the integration of social psychological research on social comparison, opens up news ways of thinking about the beliefs and attitudes that may be catalyzed by developmental relationships.

A final way in which the present study extends prior mentoring research is by shifting the focus of interest to the source of support—in particular, to the origin of the relationship (cf. Eby et al, 2006). Oftentimes, mentoring scholars have focused on demographic differences in the mentor-protégé pair such as gender or race (e.g., Ragins & Cotton, 1999). Yet rarely do we consider the primary social arena in which a relationship was cultivated. The present study, by examining a particular kind of tie, takes a more fine-grained approach to network structure, thereby allowing us to draw upon other literatures, such as the educational literature on mentoring. Future research that examines other sources of mentoring, such as family or friends, would enable us to integrate other literatures such as the sociological research on communities and kinship as well.

5.1. Study Limitations and Implications for Practice

Despite the benefits of our longitudinal design, the generalizability of our study is limited

because we studied a single cohort of students from a particular business school. It could be, for example, that the organizational structures of certain schools make the psychological processes of social comparison more likely. The use of a cohort or section structure, orientation activities, or other socialization mechanisms may affect the degree to which individuals retain ties from that institution over time. Research that extends back into the relationship-formation stage of mentoring and in different settings, such as professional associations or community organizations, could help us understand if and how early career imprinting (Higgins, 2005) affects the kinds of relationships cultivated and the stickiness of such ties as well.

Our study is also limited in scope by the ways in which we assessed the "stickiness" of the ties that provided individuals with career help in this study. Here, our concept of "sticky" referred to the extent to which an individual maintained ties to developers from his or her elite graduate school; we did not track the "stickiness" of specific ties over time. We chose this approach since the focus of the study was on where these ties came from, rather than the specific relationships that were maintained over time. In the future, these two ideas could be combined to examine sticky ties from both individual and organization-level perspectives.

From a practical point of view, the findings from this study remind us that mentoring evolves over time; relationships that were beneficial early in one's career may prove deleterious in later years. Our findings suggest that it is important to let go—to get "unstuck"— from certain kinds of developmental relationships and the extent to which one relies upon them for career support over time. Indeed, prior mentoring research suggests that mentoring relationships should naturally evolve through phases, including a separation phase (Kram, 1985). A corollary to this may be the need to separate or release oneself from receiving help from certain *kinds* of developers, lest they undermine one's sense of self and career. Second, and in a related fashion,

the present study echoes the advice of social network researchers who have advocated for building diverse networks of support (e.g., Burt, 1982). Much like a business portfolio, it is important to consider the diversity of support one receives; investing too much in one particular kind of tie can be risky. This study also offers caution with respect to the allure of elite status ties. Overinvestment in these kinds of ties may provide a view of one's career that feels perpetually out of reach, or, at a minimum, unrealistic.

We are reminded here of an interaction one of the authors had with a former student who came back to visit three years after having graduated from [elite business school]. The student said that he was unhappy and that he "really wanted to make five million dollars by the time [he] had been out five years." He proceeded to name several of his classmates who had made at least as much money. The professor looked at him incredulously and said, "You need to get yourself a new group of friends." The findings from this study, particularly with respect to peer developers, suggest that when advising students, faculty would be wise to offer advice on how to overcome these tendencies toward social comparison. Clearly, mentoring can facilitate personal and professional growth. However, depending upon from whom and how such support evolves over time, mentoring can actually impede an individual's sense of success.

Overall, individuals in this study felt "successful" and "efficacious" in an absolute sense and indeed, graduation from an elite business school may be considered at least one objective marker of success. Yet, there was no evidence that continuing to receive mentoring assistance from developers from this high-achieving environment heightened one's perceptions of career success. Rather, it seems that receiving career help from these types of developmental ties made our participants feel less successful—or "never quite good enough"—thereby suggesting new insights into how mentoring can impact the developmental journey.

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Table 1. Estimated means, standard deviations, and correlations[a]

	X	*S.D.*	1	2	3	4	5	6	7	8	9	10
1. Gender[b]	0.28	0.45										
2. Ethnicity[c]	0.23	0.42	0.00									
3. Socioeconomic status[d]	5.69	2.36	0.05	-0.13								
4. Number of mentors in developmental network (Time 1)	4.06	1.24	-0.08	-0.13	-0.14							
5. Number of mentors in developmental network (Time 2)	3.82	1.40	-0.17	-0.23 *	0.01	0.51 **						
6. Number of mentors in developmental network (Time 3)	3.51	1.46	-0.05	0.12	-0.15	0.26 *	0.41 **					
7. Amount of career help from entire developmental network (Time 1)	3.94	1.38	-0.34	0.05	-0.09	-0.03	0.05	0.12				
8. Amount of career help from entire developmental network (Time 2)	4.03	1.25	0.25 *	-0.11	-0.03	0.18	0.16	0.18	0.47 **			
9. Amount of career help from entire developmental network (Time 3)	4.08	1.42	0.14	0.04	0.10	0.12	-0.18	-0.12	0.25 *	0.24		
10. Amount of career help from developers from graduate school (Time 1)	2.12	3.39	-0.02	0.07	-0.22 *	0.17	0.00	0.13	0.20 *	0.09	0.20	
11. Amount of career help from developers from graduate school (Time 2)	1.64	2.81	0.01	-0.03	-0.21	0.13	0.10	-0.07	0.18	0.25 *	0.01	0.40 **
12. Amount of career help from developers from graduate school (Time 3)	1.43	2.77	0.03	0.03	-0.20	0.17	-0.05	0.26 *	0.02	0.39 **	0.29 *	0.37 **
13. Amount of career help from peer developers from graduate school (Time 1)	1.68	3.06	-0.03	0.08	-0.22 *	0.12	0.03	0.02	0.15	0.03	0.25 *	0.85 **
14. Amount of career help from peer developers from graduate school (Time 2)	1.19	2.17	-0.03	-0.16	-0.19	0.07	0.11	-0.17	0.20	0.08	0.08	0.34 **
15. Amount of career help from peer developers from graduate school (Time 3)	0.96	1.99	0.01	0.03	-0.18	0.11	0.10	0.12	0.04	0.19	0.26 *	0.44 **
16. Career-related self-efficacy (Time 1)[e]	5908.33	828.48	0.03	0.09	-0.07	0.00	0.06	0.21	0.39 **	0.23 *	0.14	0.09
17. Career-related self-efficacy (Time 2)[e]	5793.10	690.43	0.01	0.02	0.04	0.08	0.00	0.24	0.30 **	0.23 *	0.05	0.19
18. Career-related self-efficacy (Time 3)[e]	5778.17	816.86	0.14	0.08	0.00	-0.17	-0.14	-0.03	0.41 **	0.21	0.29 *	0.11
19. Perceptions of career success (Time 1)[f]	-6.26	791.80	-0.01	-0.08	0.06	0.09	0.12	-0.05	0.26 **	0.28 *	0.07	-0.24 *
20. Perceptions of career success (Time 2)[f]	0.00	816.90	-0.05	-0.36 **	0.04	0.18	0.12	0.23	0.07	0.29 **	0.07	-0.15
21. Perceptions of career success (Time 3)[f]	-0.56	831.53	-0.10	-0.22	0.06	-0.10	0.10	0.06	0.37 **	0.31 *	0.22	0.00

Notes: * p≤.05, ** p≤.01; [a]pairwise correlations resulted in a range of n=48 to n=136; [b]0=male; 1=female; [c]0=Caucausian; 1=non-Caucasian; [d]8-point scale, 1=less than $20,000 to 8=greater than $200,000; [e]1000=low self-efficacy to 7000=high self-efficacy; [f]1=z-scores; higher scores indicate greater perceptions of success.

Table 1, continued

	11	12	13	14	15	16	17	18	19	20
1. Gender[b]										
2. Ethnicity[c]										
3. Socioeconomic status[d]										
4. Number of mentors in developmental network (Time 1)										
5. Number of mentors in developmental network (Time 2)										
6. Number of mentors in developmental network (Time 3)										
7. Amount of career help from entire developmental network (Time 1)										
8. Amount of career help from entire developmental network (Time 2)										
9. Amount of career help from entire developmental network (Time 3)										
10. Amount of career help from developers from graduate school (Time 1)										
11. Amount of career help from developers from graduate school (Time 2)										
12. Amount of career help from developers from graduate school (Time 3)	0.18									
13. Amount of career help from peer developers from graduate school (Time 1)	0.31 **	0.40 **								
14. Amount of career help from peer developers from graduate school (Time 2)	0.77 **	-0.02	0.41 **							
15. Amount of career help from peer developers from graduate school (Time 3)	0.13	0.74 **	0.47 **	0.11						
16. Career-related self-efficacy (Time 1)[e]	0.01	0.05	0.04	-0.03	0.03					
17. Career-related self-efficacy (Time 2)[e]	0.03	0.04	0.16	-0.03	-0.01	0.74 **				
18. Career-related self-efficacy (Time 3)[e]	0.01	-0.04	0.10	-0.05	-0.06	0.62 **	0.73 **			
19. Perceptions of career success (Time 1)[f]	-0.15	-0.09	-0.36 **	-0.27 *	-0.14	0.35 **	0.27 **	0.29 *		
20. Perceptions of career success (Time 2)[f]	-0.13	-0.01	-0.24 *	-0.22 *	-0.17	0.19	0.35 **	0.14	0.58 **	
21. Perceptions of career success (Time 3)[f]	0.13	-0.12	-0.12	0.17	-0.19	0.29 *	0.34 *	0.34 **	0.40 **	0.50 **

Table 2. Multilevel Models: The Effects of Developmental Network Measures on Career-Related Self-Efficacy

	Model 1A *Unconditional Means*		Model 2A *Unconditional Growth*		Model 3A *Hypothesis 1*		Model 4A *Hypothesis 3*		Model 5A *Hypothesis 5*	
	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Fixed Effects										
Intercept	5,830.38 ***	62.96	5,824.40 ***	62.63	5,582.77 ***	252.99	6,062.86 ***	222.88	6,075.48 ***	222.15
Time (years)			-12.53	10.45	-16.91 t	10.03	-13.47	10.15	-14.34	10.15
Control Variables										
Gender					22.22	136.62	48.72	142.53	46.62	142.58
Ethnicity (dummy)					85.64	152.60	68.71	159.53	65.59	159.63
Socioeconomic status					-7.92	26.35	-7.83	27.79	-9.26	27.69
Number of developers in network (time-varying)					-45.99	29.74	-57.90 t	30.05	-55.77 t	29.88
Amount of career help										
From entire developmental network					106.78 ***	30.28				
From all graduate school relationships in developmental network							-1.26	13.34		
From all peer graduate school relationships in developmental network									-11.36	15.72
Random Effects										
Level 1										
Within-person	213,772.57 ***	24,490.29	142,038.80 ***	24,303.71	144,633.16 ***	26,041.88	138,665.43 ***	24,309.35	137,353.42 ***	24,035.57
Level 2										
In initial status	368,602.53 ***	60,483.07	387,841.34 ***	59,554.84	346,323.29 ***	57,092.62	394,566.62 ***	62,171.16	396,076.31 ***	62,262.22
In rate of change			4,441.00 **	1,680.73	2,154.26	1,462.85	2,555.72 t	1,443.54	2,601.66 t	1,435.05
Covariance			-6,527.57	6,468.65	-10,227.95 t	5,771.76	-13,792.93 *	6,153.77	-14,107.04 *	6,171.36
Fit indexes[a]										
Goodness of fit										
Deviance	4,203.61		4,193.45		3,850.09		3,890.26		3,889.75	
AIC	4,209.61		4,205.45		3,872.09		3,912.26		3,911.75	
BIC	4,220.36		4,226.95		3,910.65		3,950.90		3,950.40	
Model comparison										
Δ deviance Model 1			10.16 *		353.52 ***		313.36 ***		313.86 ***	
			(3 d.f.)		(8 d.f.)		(8 d.f.)		(8 d.f.)	
Δ deviance Model 2					343.36 ***		303.20 ***		303.70 ***	
					(5 d.f.)		(5 d.f.)		(5 d.f.)	

Notes: [t]p≤.10. * p≤.05, ** p≤.01, ***p≤.001. [a]Deviance = -2 log likelihood; AIC = Akaike's information criterion; BIC = Bayesian information criterion. Δ deviance Model 1 = deviance of Model 1 - deviance of current model; Δ deviance Model 2 = deviance of Model 2 - deviance of current model. SPSS mixed models.

Table 3. Multilevel Models: The Effects of Developmental Network Measures on Perceptions of Career Success

	Model 1B *Unconditional Means*		Model 2B *Unconditional Growth*		Model 3B *Hypothesis 2*		Model 4B *Hypothesis 4*		Model 5B *Hypothesis 6*	
	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Fixed Effects										
Intercept	-3.32	64.12	-2.07	64.90	-248.15	278.35	216.14	236.85	255.78	232.20
Time (years)			1.57	12.48	-4.43	13.63	-4.06	12.97	-7.96	12.81
Control Variables										
Gender					-75.47	136.53	-42.45	140.32	-57.71	136.08
Ethnicity (dummy)					-410.44 **	153.16	-426.15 **	158.00	-425.00 **	153.17
Socioeconomic status					1.99	26.37	-10.98	27.57	-13.73	26.72
Number of developers in network (time-varying)					0.28	36.13	14.76	36.42	13.90	35.45
Amount of career help										
From entire developmental network					91.23 **	36.16				
From all graduate school relationships in developmental network							-47.34 **	15.32		
From all peer graduate school relationships in developmental network									-81.14 ***	18.12
Random Effects										
Level 1										
Within-person	320,928.77 ***	37,697.84	231,020.09 ***	0.04	231,611.11 ***	47,194.24	231,217.62 ***	44,952.26	232,719.98 ***	45,895.59
Level 2										
In initial status	335,147.05 ***	66,757.72	376,257.09 ***	68,704.95	292,635.50 ***	64,030.55	325,133.53 ***	65,994.61	301,463.80 ***	63,805.15
In rate of change			5,424.30 *	2,621.49	5,921.61 *	2,958.34	4,426.00 t	2,618.24	3,868.98	2,577.35
Covariance			-216.59	8,754.92	-1,550.48	8,448.77	-1,630.26	8,276.75	1,385.09	8,008.97
Fit indexes[a]										
Goodness of fit										
Deviance	4,267.83		4,263.10		3,942.46		3,972.90		3,963.39	
AIC	4,273.83		4,275.10		3,964.46		3,994.90		3,985.39	
BIC	4,284.58		4,296.60		4,003.06		4,033.59		4,024.09	
Model comparison										
Δ deviance Model 1			4.73		325.38 ***		294.94 ***		304.44 ***	
			(3 d.f.)		(8 d.f.)		(8 d.f.)		(8 d.f.)	
Δ deviance Model 2					320.64 ***		290.20 ***		299.70 ***	
					(5 d.f.)		(5 d.f.)		(5 d.f.)	

Notes: $^{t}p \leq .10$. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$. [a]Deviance = -2 log likelihood; AIC = Akaike's information criterion; BIC = Bayesian information criterion. Δ deviance Model 1 = deviance of Model 1 - deviance of current model; Δ deviance Model 2 = deviance of Model 2 - deviance of current model. SPSS mixed models.