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THE EFFECTS OF ETHNICITY AND SELF-CONSTRUAL ON FRIENDSHIP NETWORKS: ENABLING CAREER SUCCESS IN ACADEMIA

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ABSTRACT

People who are similar to one another with regards to important, visible, demographic categories, such as ethnicity, tend to naturally develop friendships with each other within organizations (e.g., Marsden & Hurlbert, 1988). An important, but understudied, consequence of this general tendency to choose “homophilous” others as friends in organizations is that minority group friendship networks tend to be more cohesive than those of the majority. I selected an all-minority group of voluntarily associated management doctoral students, The PhD Project, which consists of African Americans as the majority group and Hispanic Americans as the minority group in order to empirically test two potentially competing explanations for friendship formation.

Two theoretical perspectives, structural versus cultural, were used to investigate the impact of ethnicity on these friendships. Using distinctiveness theory (McGuire, 1984) to test the structural explanation and cultural identity theory (Ferdman, 1995) to test the cultural explanation, hypotheses were proposed suggesting which ethnic group would form the more homophilous relationships. The findings in this study strongly supported the structural theory. As a group, Hispanic Americans, who were in the numeric minority, were significantly more cohesive than the African Americans, who were in the numeric majority.

I also investigated the impact of personality differences, using self-construal, to explore whether it had important consequences for individuals’ relative position in interaction networks and career success. I found no significant results for personality as a predictor of publications and presentations, as proxies for performance, nor did I find that
it was an explicator of an individual’s position in the social structure. However, interdependent self-construal did predict increased levels of perceived stress.

Findings revealed that there were positive and significant linkages between an individual’s position in the friendship network and performance. This suggests that organizations, particularly academic institutions, should explore the formation of informal networks as a means for ensuring the success of their members.
DEDICATION

This work is dedicated to my grandmother, Viterba Ortiz, who never stopped praying for me, who showed me how to survive in spite of the odds, who loved me no matter what I decided, and who I want to be like when I grow up.
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CHAPTER I: INTRODUCTION

Friendships that support and sustain people are a key part of human social interaction. There is considerable evidence that people who are similar to one another with regards to important, visible, demographic categories, such as ethnicity, tend to naturally develop friendships with each other within organizations (e.g., Marsden & Hurlbert, 1988). An important, but understudied, consequence of this general tendency to choose “homophilous” others as friends is that this propensity towards within group friendship formation tends to be stronger among members of minority groups than members of majority groups. As a result, the minority friendship network tends to be more cohesive than the majority friendship network.

One explanation for why these members tend to be more cohesive than the majority is structural. It is the relative numbers of majority and minority group members that is responsible for the heightened tendency among minority group members to identify with and befriend other minority group members (Mehra, Kilduff & Brass, 1998; cf. Ibarra, 1993). From the structural perspective, this cohesiveness may account for the exclusion of the numerically scarce group from important interaction patterns (Fairhurst & Snavely, 1983; Kanter, 1977) or it may account for purposely created segregated support networks (Friedman, 1996).

A different explanation for why minority group members are more likely to be cohesive is cultural rather than structural. From this perspective, members of a given culture are likely to share a set of common symbols, values, rules, norms, and dialects or languages that are enacted in communication (Gudykunst, 1994; Triandis, 1972) and behaviors (Cross, 1995; Oetzel, 1998). These cultural markers may be perceived by others as cultural
differences in interaction patterns (Lakey, 1996). For example, in the United States, the history of slavery is perceived to be one reason that African Americans may share an especially strong basis for social solidarity and support. From the cultural perspective, African Americans may be more likely to befriend other African Americans simply because of their shared heritage.

Although previous studies have acknowledged that both the structural and the cultural explanations are credible explanations of friendship patterns in organizations, they have not been able to empirically test these potentially competing explanations. Previous studies on this topic have tended to use samples where ethnic minorities were also the numeric minority. For example, African Americans have tended to be more cohesive than Caucasians in organizations (Mehra, Kilduff & Brass, 1998) but will one minority group continue to be more cohesive even when they are the majority group in an organization? From the structural perspective, the answer is “no.” In an organization where African Americans are in the majority and Hispanic Americans are in the minority, then the Hispanic Americans should be the more cohesive group. It is the numerically rarer group that should be more cohesive in any given setting.

However, from the cultural perspective, the answer is “yes.” Culturally based friendship formation with similar others is due to higher levels of comfort, trust, and shared historical experiences. This is the case even though it might be argued that Hispanic Americans share a cultural heritage due to, perhaps, the tendency to speak Spanish as a primary language. What makes Hispanic Americans less culturally cohesive than African Americans is the disparate countries of origin (first or second generation): Puerto Rico, Mexico, Cuba, etc. This variety of national cultures that comprise the Hispanic American
results in different attitudes and behavioral norms. Therefore, African Americans should
remain the more cohesive group irrespective of their presence as the majority or minority
group. In previous studies examining the interaction patterns of ethnic groups, the
individuals that are culturally more cohesive tend to be in the minority (e.g., Mehra, Kilduff
& Brass, 1998). It becomes difficult to disentangle whether culture or numeric scarcity
motivates the friendship formation. One contribution of this study is that it uses a unique
sample that allows me to empirically test these two conceivably competing explanations.

I selected The PhD Project, a voluntary organization of minority management
doctoral students in the United States, as the site for this research for several reasons. First,
this group is made up exclusively of minorities where African Americans are the majority
group and Hispanics Americans are in the minority. Second, the primary goal of this
organization is to foster an environment where friends can provide social support and access
to information. Third, friendships are formed voluntarily without the constraint of any
hierarchical or power relations. This organization was designed to facilitate informal
interaction between ethnic group members belonging to different academic institutions.
Typically, due to the limited numbers of minorities in those establishments, there is not much
opportunity for interaction when they return to their respective institutions. The PhD Project
spans boundaries across many geographically dispersed academic institutions and acts as a
community of practice (Baker, 2000).

Indeed, individuals themselves may vary with how much they identify with their
cultural heritage and may vary in their behavior in interactions due to differences in
personality (Ting-Toomey, 1993). Few studies (with the exception of Casciaro, 1998 and
Mehra, Kilduff & Brass, 2001) have examined the effects of personality on an individual’s
location in informal networks. Self-construal is a personality variable used to measure the role of self in relationship development in the context of differing cultural groups. The use of self-construal will allow this study to explore whether or not individuals are able to strategically place themselves in friendship relationships based on their culturally-based personality differences.

Friendships are as important to individuals in academia as in other professions because those relationships bring the same benefits; social support and critical information regarding socialization into and retention in the occupation. This research joins the growing stream of literature that views academia as an “occupational realm where true inclusion is treasured—and jealously guarded (Gersick, Bartunek & Dutton, 2000: 1027).”

As a profession, academia has certain specific performance criteria that enable career success. Research has found that the social resources available to minorities in a support network enhance their chances of career success (Friedman, Kane & Cornfield, 1998). In addition, certain personality dimensions have been found to influence individual success in organizations (Mehra, Kilduff & Brass, 2001; O’Reilly & Chatman, 1994). This study will examine the impact of friendships on career-enablers that provide the potential for success: publications and presentations as proxies for performance, perceived network value and the reduction of perceived stress.

In summary, the research questions I address in this study are:

- Which of the two alternative explanations for friendship formation exist in this all-minority organization – structural or cultural?
- How does personality influence relationship formation after controlling for ethnicity?
• What career-enabling outcomes result from friendships?

• How does personality influence outcomes directly?

The following chapter will review the existing literature on the constructs in my proposed model in Figure A and develop the hypotheses to be tested.
CHAPTER II: LITERATURE REVIEW AND HYPOTHESES

Academia is chosen as a profession for many reasons: the intellectual excitement sought in conducting scientific research, the satisfaction found in introducing students to theory and its application, and the opportunity to provide service that will support and enhance education. However, as noted, minorities may find the entrance and retention into the business academy fraught with certain unexpected, exclusionary barriers that hinder career success. A recent study examining the importance of relationships in academia noted that there were both helpful and detrimental effects of building these relationships (Gersick, Bartunek & Dutton, 2000). The central proposition of this study is that the nature of an individual’s friendship ties provides resources that influence career success. In view of the importance of these relationships, this study will also explore the impact of ethnicity and personality on the development of friendship relations.

The Effect of Ethnicity on Friendship Formation

Homophily

People befriend similar others because they tend to feel more comfortable with and interact more with people who are like themselves (Laumann, 1973; Marsden & Hurlbert, 1988); this pattern is called “homophily.” Homophily is the degree to which pairs of individuals who interact are similar in identity or organizational group affiliations:

Because persons facing similar organizational circumstances are likely to develop common interests and perceptions, homophily, not heterophily, should be the principle determining primary ties (Lincoln & Miller, 1979: 184).

For example, recent research has shown that people tend to build friendship relations with same-ethnicity others (Ibarra, 1992; Mehra, Kilduff & Brass, 1998). People who share core identities, such as ethnicity, are more likely to form stronger informal ties than those
lacking such commonalities (Thomas, 1990; Tsui & O’Reilly, 1989). Some reasons for the increased personal interaction are the result of several factors: common historical background, shared perceptions by others in the United States, and distinct physical racial markers. Members of homogeneous groups have been reported to have higher levels of interpersonal attraction than members of heterogeneous groups (McLeod, Lobel & Cox, 1996). Research has shown that same-ethnicity ties are likely to be stronger than cross-ethnicity ties (Thomas, 1993; Tsui & O’Reilly, 1989).

What is the impact of this phenomenon? In organizations where Caucasian Americans are in the majority, research has shown that homophilous ties are beneficial to majority group individuals but detrimental to the minority group members (Ibarra, 1992). Same-race ties for Caucasian males have provided resources necessary to succeed. Same-race ties for minority group members may be disadvantageous in mixed race organizations because there are not enough minority individuals in positions of power to have the resources to share. Two alternative theories will be used to explain the bases of homophily in this study where the respondents comprise solely of two ethnic groups.

Structure versus Culture

*Cultural Explanation for Homophilous Friendships*

One theoretical perspective within which we can examine why people tend to develop friendship relationships with similar others is cultural. Ethnic group membership is based on common ancestry and cultural heritage. The concept of cultural identity is defined as “the person’s individual image of the cultural features that characterize his or her group(s) and of the reflection (or lack of reflection) of these features in his or her self-representation (Ferdman, 1995:38).” Cultural identity acts as a roadmap of how a group guides an
individual’s behavior together with his or her reactions to that behavior. Each of the ethnic groups in this study has different cultural roadmaps.

The first ethnic group comprises 12% of the United States population and is of African heritage (Johnson, Bahr and Bloomfield, 1996). Included in this identity group are immigrants from the Caribbean and other areas but African Americans are predominantly native born since the 19th century. Most of their history since then has its roots in southern states. They share a common history of slavery and media-covered experiences, such as racial profiling, leading people to believe that they are oppressed and discriminated against. Mainly for these reasons, African Americans have evolved into a cohesive and distinct cultural identity group within the United States (Brigham, 1971).

The second ethnic group in this organization is Hispanic American. Ethnicity researchers warn about lumping all Hispanic subgroups under the label “Hispanic” (Marin & Marin, 1991) since there are so many subgroups which prefer other labels with which to refer to themselves. For example, many Mexican-Americans prefer to refer to themselves as “Chicano/as” which is a variation of the Spanish word “Mejicanos” where many second generation Puerto Ricans born in the United States living in New York City prefer the term “neuyoricans” to differentiate themselves from other Hispanic subgroups. Although the use of Spanish as a primary language may facilitate relationship formation, it is less likely to happen because there is a larger variance in the country of origin and subsequent cultural dimensions.

Therefore, from the theoretical perspective of cultural identity theory, although Hispanic Americans share an ethnic identification, they have dissimilar ways of looking at the world. They will have a more widely disparate cultural identity because the group’s
experience at the individual level is different for each of the Hispanic subgroups. Alternately, African Americans, because of their stronger shared cultural heritage, would be more likely to develop homophilous friendships.

Hypothesis 1a: Relative to Hispanic Americans, African Americans will tend to form more homophilous friendship networks.

Structural Explanation for Homophilous Friendships

The second theoretical perspective within which we can examine why people develop friendship relationships with similar others is based on the numerical composition of the group in the study. Research has previously examined the impact of being in the numerical minority; those fewer individuals who are different tend to bond together (Kanter, 1977b). Distinctiveness theory posits that an individual’s unique traits in relation to other people in the environment will be more salient to the individual than more common traits (McGuire, 1984). Research has shown that the relative rarity of a group in a social context tends to promote members’ use of that group as a basis for shared identity and social interaction (Mehra, Kilduff & Brass, 1998). Social identification is based on the salience of the distinctive characteristic of the group. In this study, Hispanic Americans are in the numerical minority and will therefore be more likely to form friendship relationships with other Hispanic Americans.

Hypothesis 1b: Relative to African Americans, Hispanic Americans will tend to form more homophilous friendship networks.
**Personality**

Within personality theory, an individual’s self-system, or self-concept, organizes experience, directs behavior, and provides meaning and coherence to a person’s life (Baumeister, 1987; Markus & Wurf, 1987). There has been a long tradition in psychological research of looking at how the self behaves in interaction with others and the impact on relationships. Cooley’s (1902) “looking-glass self” defines self-concept as a product of social interactions. Mead’s (1934) definition of self-concept extends the concept of the “looking-glass self” by stressing the importance of taking the role of the other in the process of social interaction.

Historically, a number of theoretical approaches to the study of personality have operated under the assumption that the self is a static and universal construct. However, Markus and Wurf’s (1987) dynamic concept of self provides an enhancement to the symbolic interactionist models represented by Cooley and Mead by specifically stating that there are as many potential social selves as there are others in the interaction. This dynamic self-concept raises the possibility that the Western concept of self is not universal to people of other cultures even if those people understand the notion of self as a theoretical construct (Markus & Kitayama, 1994).

Self-construal, the personality variable in this study, is presented as a framework within which cultural variation in cognition, emotion and motivation can be analyzed. This personality variable was developed specifically to study the role of self in relation to others and my research concerns the development of relationships in a friendship network. This construct was developed to examine personality in the context of cultural groups and my
focus is on the self in relation to others in a cross-cultural setting where ethnicity is a proxy for cultural differences.

Self-construal Definition

Self-construal is conceptualized as the constellation of thoughts, feelings, and actions concerning one’s relationship to others (Markus & Kitayama, 1991; Singelis, 1994). The variable has two separate and distinct though not mutually exclusive dimensions: independent self-construal and interdependent self-construal.

Independent self-construal

Independent self-construal reflects a bounded, unitary, stable self whose behavior is organized and made meaningful primarily by reference to one’s own internal repertoire of thoughts, feelings, and actions (Markus & Kitayama, 1994). People with independent self-construals see themselves as autonomous and independent of others. These individuals tend to focus on internal attributes such as one’s own ability, intelligence, unique personality traits, goals, preferences, or attributes that they express in public and verify in private through social comparison. Their behavior is consistent with and reflects those internal beliefs and values (Markus & Kitayama, 1991). Examples of some of the items on the Self-Construal Scale (SCS) (Singelis, 1994) measuring independent self-construal include “I enjoy being unique and different from others in many respects,” and “I am comfortable with

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a Alternative personality constructs could be considered for this study but I choose not to use them. For example, Singelis (1994) suggests that self-construal is different from Snyder’s (1974) self-monitoring in that the former is a basic disposition that guides behavior whereas self-monitoring is the ability and willingness to change (or not) based on the situation. For example, the theoretical differences between individuals with interdependent self-construal and high self-monitors are fundamentally based on the definition of the two constructs. High self-monitors remain separate from the social context but adapt to it for self-presentation purposes whereas interdependent self-construals will blend together with the social context as part of their own self-definition and will behave accordingly. Whether or not this is a matter of the self-monitor’s ability to manipulate behavior at will or if self-monitoring is a stable, dispositional trait, there are to date no studies that look at both self-monitoring and self-construal and their effects on relationships.

The NEO Five-Factor Inventory (NEO-FFI) (Costa & McRae, 1992) could also be considered as a personality variable to use in this study but the goal of this scale is to search for a universal personality trait structure whereas I am looking specifically at cross-cultural differences in personality. Due to the scarcity of such research to date on the use of NEO-FFI across cultures, self-construal was chosen as the construct to use in this study.
being singled out for praise or rewards,” and “I prefer to be direct and forthright when dealing with people I’ve just met”.

**Interdependent self-construal**

Interdependent self-construal reflects a flexible, variable self whose expression and experience of emotions are significantly shaped by a consideration of the reactions of others (Markus & Kitayama, 1994). People with interdependent self-construals experience the self as mutually dependent with others in a given social context. They behave primarily in accordance with the anticipated expectations of others’ social norms and emphasize the collective welfare and concern for the needs and goals of others. Others are usually assigned more importance than the self and will be considered in any decision or behavior (Markus & Kitayama, 1991). Sample interdependent self-construal items that reflect the importance that others have in a person’s self-concept include “My happiness depends on the happiness of those around me,” and “I often have the feeling that my relationships with others are more important than my own accomplishments.”

**Dual Selves**

Dual selves refer to the ability of individuals to have both independent and interdependent self-construals existing simultaneously. Markus and Kitayama (1991) differentiate between independent and interdependent self-construals as two separate, in-person parallel constructs of individualism and collectivism (Hofstede, 1980) that may at any point in time coexist in an individual in varying degrees of strength. Each dimension is developed to differing degrees based on the individual’s cultural socialization and personal experiences. Each dimension has the potential for development given the appropriate environmental support. The benefit of the development of the dual self is the ability to
acclimate the self more effectively to cultural and personal changes in his or her immediate social context (Bhawuk & Brislin, 1992). Given the changing demographics in the United States today, this can be advantageous when attempting to understand the interpersonal behaviors of other cultural groups.

There is empirical support for the existence of dual selves. In a study that examined the relationship of self-construal and stress, East Asian students were found to have high interdependent self-construals and American students were found to have high independent self-construals. The East Asian students were more successful in coping with stress, as was predicted for individuals high in interdependence. However, as the East Asians students became acculturated to American culture, they developed high independent self-construals while maintaining their higher levels of interdependent self-construal and ability to cope with stress (Cross & Markus, 1991). This pattern of behavior, a bicultural self-system, supports the idea of a dual self-system and suggests the coexistence of independent and interdependent self-construals in one individual depending upon the situation.

My study will use self-construal to develop hypotheses using one or both dimensions depending upon the phenomenon under examination because of its multidimensionality and its potential to describe and explain differing behaviors.

**The Effect of Personality on Friendship Formation**

**Eigenvector Centrality**

Eigenvector centrality, hereafter referred to as centrality, will be used in this study to measure the number of direct and indirect ties an individual has in the network (Bonacich, 1987). It is a common measure used in social network analysis to examine the ease with which an individual can access the center of a network either through their friends
(direct ties) or through friends of their friends (indirect ties). It measures the extent to which an individual is integrated into a network of interpersonal relationships within a group (Scott, 2000).

Centrality refers potential for communication activity. A person who is a focal point of communication is in the position to be an active participant in the network with respect to being both the sender and receiver of information (“in the know”). An individual with high levels of centrality is thought to be “in the thick of things (Freeman, 1977: 219).” Centrality is chosen for this study because the more ties that an individual has within the friendship network, the more resources are available to that individual. The increase of resources, such as access to emotional and psychosocial support, and information regarding opportunities is important to the outcomes examined in this study. Others in the network who have fewer ties will not experience the benefits and opportunities available to the centrally located individual (Brass, 1985; Burt, 1982; Ibarra, 1993).

Research on the impact of an individual’s network position in a social structure has emphasized the benefits and advantages that accrue to that individual (Brass, 1985; Ibarra, 1993). This structural approach to organization studies and the behavioral dynamics in the workplace (e.g., Kanter, 1977) tends to ignore the role that personality plays in influencing individual outcomes such as performance. Although social network analysis has been used extensively within sociological research for some time (e.g., Granovetter, 1974), the sole use

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* There are two other measures of network centrality that are used to assess an individual’s position in a social structure. The second measure of centrality, betweenness centrality, is calculated not only on the number of direct ties but also on the number of indirect ties. An individual with a high betweenness centrality score is one who has the potential to control access to or distort information by acting as a broker between otherwise disconnected others (Freeman, 1979).

* The third measure, closeness centrality, is also an index for the control of information but this measure acts as an index of independence or efficiency. An individual’s closeness to all other individuals in a network means there are short distances between actors that facilitate fewer message transmissions (independence) and shorter times and costs between messages (efficiency). An individual with a high closeness degree measure can avoid the control potential of others. They are not dependent on other people to relay messages.
of the network perspective has been recently called inadequate as an explanation of how individuals occupy certain positions in the social structure. Network analysis tends to minimize “the intentional, creative human action (that) serves in part to constitute those very social networks that so powerfully constrain actors in turn (Emirbayer & Goodwin, 1994:1413).” Researchers are calling for further research into the importance of considering both network positions and personality (House & Mortimer, 1990). The macro-structural approach as exemplified by Marx (1932), Weber (1922; 1968) or Coleman (1988) predicts the behavior of collectivities and ignores the role of the individual. The micro approach of the personality tradition overlooks the role of social structures in predicting behaviors in the relationships.

This study aims to contribute to the scant management research, with the exception of Casciaro (1998) and Mehra, Kilduff and Brass (2001), which exists in combining network position and personality to investigate performance outcomes. The purpose is to better understand both how social structure influences individual outcomes and how individuals can influence social structure. Recently, researchers, like Emirbayer and Goodwin (1994), have invited others to examine the role of individual characteristics in determining why some people occupy potentially advantageous network positions and my study aims to respond to that challenge.

Self-construal and Centrality

Based on the previous discussion of self-construal, a key point to remember is the role that the self plays in building relationships. Those individuals who have personality traits that enable them to develop many relationships simply need the opportunity (where there are other available individuals) to do so. The person whose focus is on building
relationships will develop more ties. Since individuals with interdependent self-construals define themselves primarily by referring to aspects of their social roles and memberships and to the inextricable relatedness of individuals to others (Triandis, 1989), they have the disposition that motivates them to develop those ties.

Experiencing interdependence entails seeing oneself as part of an encompassing social relationship and recognizing that one’s behavior is determined, contingent on, and, to a large extent organized by what the actor perceives to be the thoughts, feelings, and actions of others in the relationship (Markus & Kitayama, 1991: 227).

These individuals are motivated to develop social ties because their definition of self includes the need to fit in, connect and belong to a group.

Individuals with interdependent self-construals also have the skill set required for making friends. Since the desire to build harmonious relationships and adjust to various situations is important to them, they have the type of communication skills that enable the friendship development process. Their communication skills tend to be indirect and non-threatening. They are attentive to others’ feelings and unexpressed thoughts, and take into account contextual factors in interpreting messages given and received. The communication styles that individuals with interdependent self-construals possess enable them to develop relationships thereby positioning themselves as central in the friendship network.

The importance of the role of communication styles in building social ties is demonstrated by a study that examined the relationship between self-construal and interactive constraints in communication (Kim, Sharkey & Singelis, 1994). The results showed that the higher the level of independent self-construal, the greater the concern for clarity. This concern for clarity implies that the individual with independent self-construal
will tend to ignore the feelings of the other person and the context of the communication pattern. Independents preferred to be more direct in obtaining and sending messages and put the building of relationships at a lesser priority. However, the higher the level of interdependent self-construal, the greater the concern for not hurting the other’s feelings and the greater the perceived importance of avoiding negative evaluation by one’s audience. The implication of this study and others (Kim, Hunter, Miyahara, Horvath, Brosnahan & Yoon, 1996; Singelis & Brown, 1995) is that if individuals actively perceive the importance of being sensitive to the other’s feelings, they are more likely to be in the position of establishing a friendship relation because they will avoid the negative communication styles that might inhibit the development of social ties.

A person with a higher degree of interdependent self-construal sees his or her self as connected to a social situation, tends to read behavioral cues in the environment and behaves in accordance to the anticipated expectations of others’ prevailing social norms. Interdependent self-construals are capable of developing larger numbers of friendship ties because of the nature of their personality. When they think about their sense of self, they see themselves as inextricably intertwined with others. Their definition of self is shaped by the fact that they are part a relationship that is molded by the situation within which they find themselves. They also have the skills, specifically related to their communication styles, to develop many friendship relations.

Therefore, if higher centrality is assigned to actors with the larger number of friendship ties, then interdependents are at an advantage due the ability to better manage numerous ties and have the disposition to do so by nature of their personalities.

Hypothesis 2a: The higher the interdependent self-construal, the higher the individual’s centrality in the friendship network.
Is it possible to predict a relationship between independent self-construal and centrality? A person with a higher degree of independent self-construal sees him or her self as separate from a social situation, tends to ignore behavioral cues in the environment and behaves in accordance to his or her own internal beliefs and values (Markus & Kitayama, 1991). This is not to imply that independent self-construals are incapable of developing friendship relations. They will tend to form relationships based on more instrumental goals, separate from the social context, that are directly expressed to others. Informal social networks are less likely to be sources of instrumental benefits but one cannot preclude the possibility that these benefits might be the goal of a friendship relation if both parties are direct in communicating this goal as an outcome of their relationship. Independents are then, by nature of their personalities, predisposed to develop fewer friendships.

Hypothesis 2b: The higher the independent self-construal, the lower the individual’s centrality in the friendship network.

**Career Success as the Consequence of Friendships**

There are beneficial outcomes that enable career success for those individuals who have developed friendships. Career success is reflected by the ability of an individual to meet a standard of performance, to stay with a particular organization and to meet the goals of the organization. Management research has long recognized the importance of the relational element of career success (Kanter, 1977; Roethlisberger & Dickson, 1949) and has recently examined the role of ethnic networks as an explanatory factor in career success (Friedman, 1996). The organization in this study is preparing individuals to enter into and succeed in academia.
There are three proxies for career success in this study; performance, perceived network value and perceived stress (which, when reduced, can facilitate attaining career success).

Performance

Overt criteria for success in academia are usually documented publicly: the relative importance of research, teaching and community service in the tenure process and promotion policies. Within these criteria, there may be a specified number quantifying performance. For example, the number of publications, as well as the documented quality of the publications, is a proxy for performance. In addition, some institutions note that presenting research at professional conferences is also important. Publications and presentations, as proxies for performance, reflect an instrumental and task-oriented impact of friendships. Regardless of the type of academic institution, e.g., private versus public, small versus large, or any combination, success and future upward mobility depends upon research and publication achievements (Gleckner, 1998). Therefore, the ability to generate publications and presentations are important factors to examine.

*Homophily and Performance (Publications and Presentations)*

In discussing publications and presentations as indicators of career success, homophily becomes a double-edged sword. On the one hand, if homophily does have a positive direct effect on the indicators of career success, it would be due to the ease of interaction, the greater degree of trust, and the willingness to share information. These social ties could facilitate the collaborative process during joint research projects often required in producing publications. The comfort level within a homophilous group in a friendship network might also encourage an individual to be “generous in spirit” and refer another
person to someone else in the group that might be a potential research collaborator. Therefore, irrespective of the ethnic group, homophily will be an aid to performance.

Hypothesis 3a: The more homophilous an individual’s friendship network, the greater the number of publications.

Hypothesis 3c: The more homophilous an individual’s friendship network, the greater the number of presentations.

An alternative explanation exists for the relationship between homophily and publications. A successful publication record requires the ability to create and develop theory and to “think paradoxically: to consider conflicting views simultaneously (Lewis & Grimes, 1999: 683).” Theory construction may be hindered by the existence of similarity in ethnicity.

This alternative perspective of the relationship between homophily and publications is supported by the literature which notes homophily has the potential to have detrimental effects in expressive networks, such as the friendship network in this study (Brass, 1985; Ibarra, 1992). Homophily reduces access to information from disparate parts of the social system (Granovetter, 1973). Strong ties bond similar people and similar people tend to be interconnected (Krackhardt, 1988). Information obtained via strong ties tends to be redundant. This perspective indicates that limited access to varied resources may indeed inhibit creativity.

Hypothesis 3b: The more homophilous an individual’s friendship network, the lower the number of presentations.

Hypothesis 3d: The more homophilous an individual’s friendship network, the lower the number of presentations.
Centrality and Performance (Publications and Presentations)

Freeman (1979) notes that in a friendship network, centrality may translate to gregariousness, popularity or the probability of receiving information. Information tends to flow better within groups than between groups so individuals are not simultaneously aware of opportunities in all groups (but will be over time). Therefore, people who are informed early or more broadly have an advantage over those who are not as well-connected, i.e., more central, than those who are not (Burt, 2000).

Few studies have examined the link between centrality and performance in academia with the exception of Baldwin, Bedell & Johnson (1997) who found a positive relationship between the centrality of M.B.A. team members and their grades. By extension, centrality can be said to enhance academic performance by providing actors with richer, timelier information than can be otherwise attained (Burt, 1992). The number of relationships among network members appears to influence the ability to access information regarding opportunities in a network. The opportunities in this study mainly relate to research opportunities.

Hypothesis 4a: The greater an individual’s centrality within the friendship network, the greater the likelihood of achieving publication success.

Hypothesis 4b: The greater an individual’s centrality within the friendship network, the greater the likelihood of achieving presentation success.
Perceived Network Value

The ability to perceive the relationships of members in an individual’s friendship network as valuable can be a resource that enables success in an academic’s career. The value of a network lies not only in the access to instrumental benefits but in the ability to obtain “…a sense of belonging and an understanding of what is expected…(Podolny & Baron, 1997: 690)” which is accomplished via an expressive network such as the one in this study. This type of resource, though intangible, facilitates the academic’s success by easing his or her way through the socialization process in an academic institution. Perceived network value denotes a long-term perception of future career success. In this study, if individuals perceive that academic success is related to their activity in a friendship network, they are more likely to value that network.

One particular framework suggests that values, defined as preference for reinforcers in the work or academic environment (Dawis & Lofquist, 1984), are important explicators of activity involvement. Values are learned via interactions or observations of family members, peers, teachers, other significant persons, cultural and religious institutions, and print and electronic media source provide much of the context for imparting values and personal standards of behaviors (Lent, Brown and Hackett, 1994:91).

Individuals develop preferences for these values based on their interactions and they perceive different activities or occupations as varying in terms of their ability to satisfy these extrinsic outcomes. Therefore, if an individual is socialized or learns that particular outcomes will be the result of a particular academic activity then they will value that activity (Dawis and Lofquist, 1984). In this study, they will have learned that friendships are important sources of support, they will perceive their network participation as valuable.
Homophily and Perceived Network Value

People tend to use social networks as a way to find support for their own interpretations of experiences (Krackhardt & Kilduff, 1999). These expressions of similarity in attitudes based on shared norms or attributes, as in a homophilous network, are an indication that people will be inclined to make similar attributions about values, objectives and goals. This influence of similar others, through social comparison processes (Festinger, 1954), would explain why similar others might be inclined to hold similar opinions regarding why perceived network value leads to career success.

Friends tend to establish mutually reinforcing world-views about their chances of success in an organization where the goal of the organization is to provide the social support needed for that very purpose. The trust built that underlies the friendship development implies reciprocity of support not only in current situation but in future network relationships that will continue to exist. The perceived value of the network is in the mutually held perception that similar others will continue to provide the social resources that have developed in the friendship relation.

H5: The more homophilous an individual’s friendship network, the greater the likelihood that an individual will perceive the network as valuable.

Centrality and Perceived Network Value

Centrality has been associated with feelings of belongingness or acceptance into a group (Miller, 1984). Individuals high in centrality will tend to view their situation as more favorable than those who are not because centrality implies greater control over resources and a broader array of benefits (Burt, 1982; Brass, 1992). More friendship ties and sources
of psychosocial support will tend to increase individuals’ satisfaction with the relationships developed and they will perceive this particular network as valuable.

In one study, Friedman (1998) proposes that, per social network theory, network groups have the potential to enhance the social resources available to women and minorities and thus enhance their chances of career success. The authors surveyed members of the National Black M.B.A. Association to determine whether network groups had a positive impact on career optimism, what specific aspects of these groups were most beneficial, and whether groups enhanced isolation or discrimination. One significant result from their study indicated that network group participation had a positive overall impact on the career optimism of Black managers.

Therefore, the logic in the following proposition based on Friedman’s (1998) study is that more friendship ties provide more psychosocial support and that more support increases individuals’ satisfaction with the network of relationship. That satisfaction has a positive impact on their perception of an optimistic and valuable career.

Hypothesis 6a: The greater an individual’s centrality in the friendship network, the more likely the individual will perceive the network as valuable.

Perceived Stress

The third proposed consequence of the social ties that develop in a friendship network that acts as an enabler of career success is the reduction of perceived stress. In a study of the importance of relationships in academia (Gersick, Bartunek & Dutton, 2000), one of the categories of narratives derived was the impact of “harming stories.” These stories
exemplified instances of perceived marginalization or rejection and denial of resources that undoubtedly added to the perceived stress that was detrimental to the academic’s career. This same research also categorizes stories about relationships that provide emotional support. This type of collegial support may assist in reducing perceived stress by providing “safe harbors” (Kahn, 1998 as cited in Gersick, et al., 2000). These “safe harbors” provide opportunities for giving voice to those feelings of being under stressful situations that individuals cannot control without sensing that there might be some retribution from those who are outside of the friendship network.

Covert criteria for success in academia requires political savvy, much as in any corporate culture (Toth, 1998). It requires, especially for ethnic groups, the ability to gain entrance into the network of existing faculty. The multiple roles required of ethnic groups in academia are usually those of any token member in a majority group (Bell, 1990; Kanter, 1977) and the perceived stress of having to perform better, if not as well, is a source of anxiety which may impact performance. Women of color are marginalized within institutions of higher education and develop friendships that help to give voice to their common experiences (Booze, 2000; Gersick, Bartunek & Dutton, 2000). This action alone can help to reduce perceived stress by the social support offered through social ties in a friendship network.

*Homophily and Perceived Stress*

Perceived stress is an important variable to study. If an individual feels overwhelmed by a particular task or situation, that perceived stress is likely to result in a degradation of performance due to the feelings of not being in control of the situation (the stressor causing the emotional or psychological reactions). This perceived stress, even though it is just a
cognitive appraisal of the situation, may occur because the individual lacks confidence in his or her ability to handle a problem adequately or because he or she feels overwhelmed with the quantity of work to complete. These are issues that, as in most professions, arise when there are specific promotion requirements and deadlines.

Therefore, when confronted with stressful situations, individuals will tend to turn to their network of friends, who are experiencing similar circumstances, for social support. Specifically, when speaking of the relationship between homophily and stress, individuals within this minority network will tend to turn more readily to others who are similar to them on the same demographic characteristic, i.e., African Americans to African Americans, Hispanic Americans to Hispanic Americans. Having same-ethnicity friends who are in the same situation, and can be empathetic, would lessen the perceived stress that an individual experiences. Therefore a personal network characterized by many strong ties is inefficient for instrumental purposes but is more efficient for expressive purposes such as the psychosocial support required to alleviate perceived stress. Expressive goals (such as emotional support) are likely to be accomplished via strong ties such as those in a homophilous group.

Hypothesis 7: The more homophilous an individual’s friendship network, the lower the level of perceived stress experienced by that individual.

Centrality and Perceived Stress

One of the main objectives of The PhD Project is to provide the necessary social support in order for its members to perform successfully in their academic careers. One way to measure whether or not the members are receiving that support is to measure their
perceived stress levels. It is expected that the more stress experienced, the more difficult it will be for them to be able to meet the required milestones of their respective programs.

It follows then that the more central an individual is, the more emotional support and companionship they receive. Studies have found that larger networks provide more support (see Walker, Wasserman & Wellman, 1994 for a review). This is because there are more people available who have the potential to provide social support to buffer the potential negative impact of stress.

Hypothesis 8: The greater an individual’s eigenvector centrality within the friendship network, the less perceived stress an individual will tend to experience.

The Direct Effects of Self-Construal

Self-construal, thus far, has been proposed to have the ability to predict centrality as a social tie in the friendship network. My study will also explore the potential of self-construal to predict direct effects on two of the career success outcomes of this research: performance and perceived stress. Self-construal has the flexibility and potential value of describing either one or two distinct yet complementary facets of the self.

Performance (Publications and Presentations)

Performance requires individuals to be instrumental and goal-oriented (in addition to having the prerequisite human capital) in order to succeed in academia. Even in those situations where publications or presentations are produced with co-authors, the number of co-authors is small compared to the number of potential people in an individual’s friendship network. The underlying assumption motivating the behavior of individuals with independent self-construal is that actions taken will be consistent in all situations (and thus
will be directed at being successful in this arena) whereas those with interdependent self-construal will, at this early stage in their career, focus on building relationships.

Since the main task of independents is to feel satisfied with themselves so that their self-esteem increases, the motivation would be to do what is required to achieve personal goals. Since the goals of individuals in academia is to achieve career success via performance, I propose the following exploratory hypotheses.

Hypothesis 9a  The higher an individual’s independent self-construal, the greater the number of publications.

Hypothesis 9b  The higher an individual’s independent self-construal, the greater the number of presentations.

Perceived Stress

There are individual differences in how perceived stress impacts behavior. Self-construal presents a way to use a personality variable to understand this phenomenon. Some individuals seem to rise to the challenges presented by a perceived stressful situation. They strive to meet or exceed the performance expectations that might normally debilitate others who “burn out” or “shut down”. These people are predisposed to treat perceived stress as a challenge instead of a threat.

Other individuals treat perceived stress as an obstacle in achieving their stated goals or in feeling confident about their ability to succeed in spite of their personal problems. These people tend to need outside assistance to be able to overcome problems in their daily life or need a sympathetic ear to feel less isolated or inundated. Self-construal presents a way to examine each of these types of individuals.
In an empirical study exploring the impact of self-construal on perceived stress and the process of coping, it was found that students with interdependent self-construals reported more stress than did independents (Cross, 1995). It was found that students with interdependent self-construals experienced more stress as a result of not having the direct coping strategies that students with independent self-construals used.

Although there is not yet theoretical or empirical support for a relationship between independent self-construal and perceived stress, I believe an argument can be made within this particular organization in my study. Individuals with independent self-construal are motivated by achieving personal goals and attributing behavior to internal, unique attributes thus enhancing their self-esteem (Markus & Kitayama, 1991). These individuals are likely, when confronted with situations that have the potential to be overwhelming or problematic, to cognitively take inventory of their personal strengths and rely on coping mechanisms to assist them in reducing perceived stress. This can be inferred from Oetzel’s (1998) study on the direct communication style of individuals with independent self-construal. Events are appraised as situations to be dealt with directly and not as opportunities to be coped with circuitously while seeking socially appropriate solutions.

In addition, it should be emphasized that the independent and interdependent self-construal scales were not correlated with each other in other studies, confirming previous findings that these measures represent two distinct, unrelated components of the self (Singelis & Brown, 1995; Trafimow et al., 1991, Triandis, 1989). Therefore, from the empirical support and theorized propositions regarding self-construal and its direct effect on perceived stress, I propose the following hypotheses.
Hypothesis 10a: The higher an individual’s interdependent self-construal, the more likely the individual is to experience stress.

Hypothesis 10b: The higher an individual’s independent self-construal, the less likely the individual is to experience stress.

Conclusions

In summary, this study contributes to several streams of research. First, it adds to the stream of research regarding the development of friendships by testing two competing hypotheses proposing either a structural or a cultural explanation. Second, it takes advantage of the unique opportunity to explore personality as it impacts the formation of friendships within a minority network. Third, it contributes to a greater understanding of self-construal and its value as a multidimensional personality construct. Finally, it adds to the social network and individual performance literature by demonstrating a relationship between the friendships and outcomes in a field setting.
CHAPTER III: METHODS

Research Setting

This research was conducted as part of a larger study of informal networks within The PhD Project. Top management members of more than a dozen Fortune 100 corporations founded this organization in 1993 as part of corporate diversity initiatives. The objective of this organization is to provide social support to doctoral students to enable them to succeed in the academic arena.

The students meet as a group once a year for three days. These meetings provide opportunities to interact in formal, informational sessions on how to succeed in academia. In addition, the students interact during social occasions and meals. Late evenings are occasions for voluntary interpersonal activities. A number of students also attend the annual recruiting conference and engage in personal relationship development there. Some students attend regional professional associations together. All other communication between members takes place via emails, listservs, phone calls and letters.

The lack of formal hierarchy in this organization is due to its very nature. It was specifically created to foster peer support and encouragement. The colleagues in this organization possess approximately equal levels of human capital: at least one masters degree or some form of post-graduate education and prior professional experience. This helps to create an egalitarian atmosphere free from any attendant feelings of status or power that might otherwise hinder the examination of the development of network ties (Pfeffer, 1991). The members of this organization are free to choose those with whom they wish to interact.

This organization is an ideal candidate for my study for three other reasons. First, as previously mentioned, little research in the management literature that has been conducted on
minority groups has shown significant results due to their small numbers in organizations (Nkomo, 1992). In addition, very little research has been conducted with more than one minority group. In those instances where diverse minority groups exist, they are frequently treated as one homogeneous group (see Ibarra, 1995). This sample allows for a finer-grained analysis of the complex variable of ethnicity, as a proxy for culture, when examining homophilous friendship groups.

Second, the size of the population is well suited to the “whole-network” approach adopted in this study. Network data is gathered from each organizational member from every other member. This would be difficult to do with a larger organization due to the time-consuming task of filling out a potentially lengthy survey.

The third reason is that there is a precedence in the management literature for exploring the informal formation of minority support groups. Similar to network groups in corporate organizations such as Xerox (Friedman, 1996), this informal, non-hierarchical group was formed based on social identity (ethnicity) and the goals were based on the needs of the group. This group is self-managed, self-controlled and is a publicly recognized organization similar to the networks established at Xerox.

Data Collection

Most of the data, including demographics, personality and network data, were collected via a paper and pencil survey instrument titled *Interpersonal Network Questionnaire* (See Appendix A for survey). I used the Total Design Method (TDM) developed by Dillman (1978, 2000) following the steps outlined to both design the questionnaire and increase the response rate of the survey respondents. The use of this methodology resulted in an increase in the response rate from the initial mailing of 12.6% to
a final response rate of 74%. See Appendix B for the original letters mailed to the sample population. They include the description of the project (Interpersonal Networks and Career Success) and the letter from the Executive Director of the KPMG Foundation in support of the research. Appendix C contains the follow-up postcard wording and the final follow-up letter dated June 5, 2000. The intermediate milestones, achieved by sending follow-up postcards, emails and additional surveys, and the resultant cumulative response rates are detailed in Table 1.

The originally designed questionnaire contained the Universal Orientation Scale (Phillips & Ziller, 1997). This scale is intended to capture a respondent’s perception of similarities rather than differences between the self and others. This version of the questionnaire was pre-tested with doctoral students at the University of Cincinnati. The Universal Orientation Scale was dropped for two reasons. First, it added an additional four pages to an already lengthy questionnaire and the time to complete this version of the questionnaire averaged 40 to 45 minutes. In addition, there was no variation in the responses making it difficult to provide any predictive power.

The second version of the questionnaire was pilot tested with ten members of The PhD Project: they varied in ethnicity, gender, geographic location, and tenure in the program. Results from this pilot test led to the re-wording of sections regarding the networks and the deletion of the experimental personality variable discussed above. The definitions and the instructions for filling out the network matrix were clarified. The time to complete this version varied from 20 to 30 minutes depending upon how many network ties were indicated.
Sample

At the time of data collection, there were 151 student members in the organization. These students were able to choose to select as many ethnic categories as they felt described themselves: African American, Hispanic American, Native Americans, Asian Americans, and Others (a category created by those who chose to identify themselves as belonging to more than one of the above ethnic categories). In addition to the fairly equal educational and professional experiences, the average age of the final sample was 36 years old, 53% were married, 46% had children, and the average tenure in the organization was 3 years and 4 months.

Measures

Ethnicity

This variable was self-reported on the questionnaire. Respondents were free to choose as many ethnic categories as they felt applied. The initial response rates (as detailed in Tables 2 and 3) revealed that the majority of the population fell into two of the categories: African American and Hispanic American. The 5 Native Americans (3 men and 2 women), 1 Asian American male and 2 male Others were dropped from the sample as it was determined that those small numbers were likely to result in insignificant findings when comparing ethnic groups in the study. The final response rate for the African American and Hispanic American sample, detailed in Tables 4 and 5, was 72%.

Both ethnicity and gender were self-reported on the questionnaire. In the final sample, ethnicity was coded as a 1 for African Americans and 0 for Hispanic Americans.

Self-construal

Self-construal was measured using the Self-Construal Scale (SCS) developed by Singelis (1994). Self-construal is the constellation of feelings, cognitions, and behaviors of
an individual in relationship to both how they view themselves and how they view themselves in relation to others. SCS treats the construct of self-construal as two-dimensional based on the concept as originally developed by Markus and Kitayama (1991). The 24-item scale measures the level of strength of independence and interdependence as the two separate dimensions of self-construals (12 items per dimension) that can coexist in one individual. The SCS uses a 7-point Likert-type scale that ranges from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”). Two scores, one for each dimension, are generated for each individual by averaging the scale items for each of the 12 items that refer to independence or interdependence.

Items for independent self-construal include “I act the same way no matter who I am with,” and “I enjoy being unique and different from others in many respects.” Items for interdependent self-construal include “It is important for me to maintain harmony within my group,” and “I will sacrifice my self-interest for the benefit of the group I am in.” Two scores are generated: a score for independent self-construal and a score for interdependent self-construal. See Appendix D for a complete list of the items.

Singelis (1994) developed the scale using two samples of undergraduate students from the University of Hawaii at Manoa. He reported that the scores of the two subscales were normally distributed in both samples, and that factor analyses confirmed the two factor structure showing that the two factors, independence and interdependence, have an orthogonal relationship. Construct validity was established by showing differences in self-construal between Asian Americans (combined Japanese, Chinese, Korean, and Filipino ethnic groups) and Caucasian Americans. These differences were consistent with Markus and Kitayama’s (1991) characterizations: Asians scored higher in interdependence and North
Americans scored higher in independence. The reliability of the SCS was moderately improved from previous scales that attempted to capture independence and interdependence (Cross & Markus, 1991; Hui, 1988). Singelis (1994) tested the predictive validity of the scale by examining the relationship between the interdependence scores and the degrees of attributions to the effects of situation influences in given scenarios. He found a positive correlation between the two. This supported the idea that strength in interdependence predicts tendencies for attributions to situational or contextual influences. The reliability of the SCS was moderately improved from previous scales. The Cronbach alpha obtained from the two samples for the independence and interdependence subscales of SCS fell into an acceptable range of .74 to .73 and .70 to .69 respectively (Singelis, 1994).

In order to determine whether or not the items in the SCS measure are reliable, i.e., internally consistent, I calculated Cronbach alphas for both the independent and interdependent dimensions of self-construal. Reliability analysis should have confirmed the extent to which the items in the scale are related to each other and identify problem items that should be excluded from the scale. I ran a principal components factor analysis with a Varimax rotation method using the Kaiser Normalization in order to investigate the number of underlying factors and confirm what the factors represented conceptually. Both the reliability analysis and factor analysis should have been in line with Singelis (1994) and other subsequent studies (Cross & Markus, 1991; Hui, 1988).

However, I found nine components whose reliabilities ranged from -.28 to .74. I examined the items for their face validity and in order to determine if the items aligned to the definitions of interdependence and independence based on the original definitions of self-construal (Markus & Kitayama, 1991). I found that they did match the constructs original
intent so I conducted the analysis again and imposed two factors. The interdependent self-construal dimension contained nine of the original twelve items with a mean of 4.20, a variance of 1.92 and a reliability of .76. The independent self-construal dimension contained five of the original twelve items with a mean of 5.52, a variance of 1.37 and a reliability of .66. These numbers were not significantly different from previous research.

In studies subsequent to my data collection, attempts to improve the validity, and more thoroughly examine convergent and discriminant validity were conducted. In the latest version of the SCS (T. M. Singelis, personal communications, April 2, 2002),

“Six additional items have been added to improve internal reliabilities of the original scale…Cronbach alpha reliabilities with the 15 items have been ranging from the high .60’s to the middle 70’s. It is felt that these reliabilities are adequate considering the broadness of the construct and the wide range of thoughts, feelings, and behaviors assessed by the scale. Items more focused on a single aspect of self would yield higher internal consistency but would threaten the validity of the measure. For a brief discussion of this issue, which is called the “fidelity vs. bandwidth dilemma” see Singelis, Triandis, Bhawuk & Gelfand, 1995.

Please note that the original item 2 (I feel comfortable using someone’s first name soon after I meet them, even when they are much older than I am) has been replaced. It was determined that this item was not appropriate for collective cultures, such as Japan, where first names are rarely used at initial meetings. Therefore, a replacement item was constructed to capture the conceptual equivalence of feeling equal and comfortable with people recently met. The current item #2 (I can talk openly with a person who I meet for the first time, even when this person is much older than I am) has been translated and used successfully with both US and Hong Kong Chinese participants.”

I enclose this correspondence as evidence that this measure is “still under construction.” Closely related to the construct of interdependent self-construal is the Connectedness Scale (Rude & Burnham, 1995) which consists of two distinct factors. One, connectedness, was characterized by concern for relatedness and the importance of
relationships to self. The other neediness, concerned depression Cronbach’s alpha for
connectedness for their sample was .81. However, this construct has not been widely used.
In another study using the concept of interdependence, Cross & Vick (2001) used the
Connectedness Scale and the Relational-Interdependent Self-Construal Scale (RISC) (Cross,
Bacon & Morris, 2000). RISC was developed to specially tap the conception of the self as
defined by one’s close relationships. This measure had high internal reliability ($\alpha = .87$) and
was shown to have good convergent and discriminant validity. Participants in that study also
completed the original Singelis (1994) interdependent dimension of the Self-Construal Scale
and the Cronbach $\alpha$ was .75.

Therefore, the reliabilities, though lower than might be desired, are comparable with
those reported in other studies. It is possible, that given the relationship-specific nature of
the interdependent self-construal, respondents might have had in mind a variety of groups
when answering questions. This could have resulted in greater variability in responses and
lower levels of reliabilities than found in other measures. However, I decided to use the scale
as it was designed and tested by Singelis (1994) based on his research and the subsequent
research of the others cited in the literature review.

When I performed the analysis with my data, the interdependent dimension had a
mean of 4.34, a variance of 2.09 and a reliability of .74. The independent dimension had a
mean of 5.15, a variance of 2.01 and a reliability of .65. The correlation of independent and
interdependent self-construals were negative and significant ($r = -.19, p < .10$), as I expected,
indicating that they were indeed separate and distinct constructs.
Centrality

In order to calculate centrality, it was necessary to collect whole network data. I asked respondents to look down a list of fellow organization members and place checks next to the appropriate names for each one they considered a friend. The boundary of this network was easily defined as it consists of only those African American and Hispanic American doctoral students in the United States majoring in Management. They were provided with a list of the names of individuals in the organization, sorted by school, as an aid to recall. This type of roster method facilitates individual’s recall of typical patterns of interaction and has been found to be reliable (Marsden, 1990). Respondents were free to nominate as many contacts as they felt were representative of the number of friendship relations they maintained. Friendship was defined as people “with whom you like to spend your free time during conferences, people with whom you feel an emotional attachment, or people with whom you keep in touch during the year.”

The data was arranged in a 103 by 103 binary matrix. Each cell \( X_{ij} \) in this matrix corresponded to i’s relation to j as reported by i. For example, if José (i) reported Thomas (j) as a friend, then cell \( X_{ij} \) in the friendship matrix was coded as 1, otherwise \( X_{ij} \) was coded as 0. Centrality was calculated using a symmetrized matrix. A symmetrized matrix will replace \( X_{ij} \) and \( X_{ji} \) by 1 if \( X_{ij} \) or \( X_{ji} \) is equal to 1. This will reflect a friendship tie if either of the individuals indicated that they considered the other a friend. The resultant matrix contained 10,609 observations on all possible pairs of people. UCINET 5.0 (Borgatti, Everett & Freeman, 1999) was used to calculate an eigenvector centrality score for each respondent. A person who is connected to many people who are themselves well-connected will have a high eigenvector score (Bonacich, 1987).
Social network data are collected by asking individuals to report on their perceptions of their own interactions. I accessed the respondents' perceptions by asking them to consider as friends those people with whom they liked to spend their free time, with whom they felt an emotional attachment or with whom they kept in touch. The accuracy of these perceptions is cause for concern with respect to issues of validity, reliability and measurement in social network data. Some research has shown that people are not very good at accurately recalling their interactions in certain specific situations (see Wasserman & Faust, 1994 for discussion). However, other research has shown that what people recall about long term patterns of relationships is often related to stable social structures rather than to particular instances of interactions (e.g., Freeman, Romney & Freeman (1987). In The PhD Project, how respondents perceive their interactions is shaped not only by specific instances of face-to-face exchanges once a year, but additionally by phone calls and written communication via emails, letters and informational newsletters that act as reminders of interaction behaviors. It has been found that informants are able to report interaction frequencies accurately (Kashy & Kenney, 1990). Therefore, the social network data in this study should be accurate representations of the friendships developed this organization.

This study explored whether centrality was related to career success indicators in academia, similar to how promotions are used as a measure of career success in other professional environments. This was to provide evidence of construct validity as discussed by Carmines and Zeller (1979). For example, centrality has been shown to be related to a higher likelihood of promotions (Brass, 1981).

Measurement error, the discrepancy between the “true” and observed values in social network research, reflects the difference between the actual structure of the network and the
reported network ties (Wasserman & Faust, 1994). This type of measurement error is minimized by collecting whole network data as opposed to asking each person to list a fixed number of friends, which can introduce measurement error into the network data (Holland & Leinhardt, 1973).

Homophily.

The homophily index captures the extent to which an individual interacts with similar others based on salient characteristics such as gender or ethnicity. Homophily was calculated using the formula

\[
\frac{ad - bc}{\sqrt{(a+c)(b+d)(a+b)(c+d)}}
\]

where: (a) was the number of ties a person sent to people of the same attribute, (b) was the number of ties people sent to people of the opposite attribute, (c) was the number of people of the same attribute an individual could have cited but did not, and (d) was the number of people of the opposite attribute an individual could have cited but did not. The attribute in this study is ethnicity.

This formula controls for availability (Krackhardt, 1990). It is important to control for availability so that the scores will indicate choice, as opposed to induced, homophily. Induced homophily is the result of availability constraints (McPherson & Smith-Lovin, 1987). For example, the tendency for men to form homophilous relationships in an organization simply because there are more men to choose from would result in induced homophily. Choice homophily is the result of people seeking to develop relationships with similar others based on some other criteria such as mutual interests or, as in this study, ethnicity.
The calculated index for each individual ranges from –1 to 1. Positive values indicate the tendency for a person to choose people of the same attribute as friends, given the availability of the members of that same attribute. A value of zero indicates a balanced mix of different attribute choices, e.g., a mixed balance of African American and Hispanic American. Negative values indicate the tendency for a person to choose people of the opposite attribute as friends. For example, a negative homophily score for a Hispanic American, when calculating homophily, would indicate a tendency to choose African Americans as friends rather than other Hispanic Americans.

Career Indicators of Success

*Performance (Publications and Presentations).*

As an indicator of potential career success in academia, archival data was collected for both publications and presentations as of June, 2002. Previous research has used the number of presentations of research papers at conferences and professional meetings as a performance-based indicator (Mickelson, Smith & Oliver, 1993). The number of publications for each respondent was collected from on-line databases (from EBSCO). A publication was counted regardless of whether or not the respondents were sole authors or co-authors. The number of presentations was collected from Academy of Management Conferences from August, 1996 to August, 2002. There was, therefore, a two-year period between the end of the self-reported data collection and the archival collection of performance data. Again, a presentation was counted regardless of whether or not the respondents were sole authors or co-authors.
Perceived Network Value.

As an indicator of how valuable an individual perceived his or her network, each respondent was asked to indicate how valuable the friendship network has been to his or her career success. This one item measure uses a 5-point Likert scale that ranges from 1 (“Not Valuable at All”) to 5 (“Extremely Valuable”).

Perceived Stress.

The Perceived Stress Scale (PSS), developed by Cohen, Kamarck & Mermelstein (1983), was designed to measure the degree to which situations in one’s life are appraised as stressful. The PSS uses a 5-point Likert-type scale that ranges from 1 (“Never”) to 5 (“Very Often”). I selected four items from the fourteen items on the original instrument. The 4-item scale measures the level of perceived stress experienced by an individual since joining his or her doctoral program.

Scale items included “How often have you felt that you were unable to control the important things in your life,” and “How often have you felt difficulties were piling up so high that you could not overcome them.” The score, calculated by taking the average, is a continuous variable that measures the level of the respondent’s perceived stress during his or her doctoral program. See Appendix C for a complete list of the items.

This scale was chosen over other scales that measure objective measures of stress (such as direct impact on physical and mental health). Using other measures would have required gathering medical data or the observing individuals interacting with their environment and their resources available to cope with the situation. This was not logistically feasible for the sample. Subjective measures of response to specific stressors, for example, perceived occupational stress (Kahn, Wolfe, Quinn, Snoek & Rosenthal, 1964),
were not used because there is evidence that people often misattribute their feelings of stress to a particular source when the stress is actually due to another source (see review in Cohen, Kamarck & Mermelstein, 1983).

Therefore, the more global approach to measuring levels of perceived stress is appropriate to this study. The questions are general in nature and relatively free of content specific to any subpopulation group. This scale was developed using three samples, including two sets of students, involved in a smoking cessation program. There were no significant differences for the means between men and women, nor was age related to PSS in the samples. The coefficient alpha reliability for the PSS was .84, .85, and .86 in each of the three samples. The tests showed that PSS was a better indicator than more objective measures, such as the Life Events Scale (LES) (Levine & Perkins, 1980) or the Cohen-Hoberman Inventory of Physical Symptoms (CHIPS) instrument (Cohen & Hoberman, 1983). This provided evidence for the concurrent and predictive validity of PSS.

An additional test of predictive validity was the use of PSS versus the LES as a predictor of social anxiety. It was predicted that higher levels of perceived stress in college students positively impacted social anxiety. The social anxiety scale (Watson and Friend’s 1969 Social Avoidance and Distress Scale) provided a trait measure that tapped difficulty in making friends and social contacts. In both student samples, increases in social anxiety were associated with increases in perceived stress. In this study, it is proposed that the less able an individual is to develop friendships, the more perceived stress he or she will experience.

I conducted a factor analysis using the Principal Components Analysis extraction method. The rotation method used was a Varimax with Kaiser Normalization. One
component, using the four items I selected, accounted for 66% of the variance and the reliability was a respectable .83.

Control Variables

Tenure.

The longer a person is part of an organization, the more people they are likely to meet and the more likely they are to develop friendship relations because they are likely to develop similar views as a cohort group (Krackhardt & Kilduff, 1989). Tenure may then influence an individual’s perceptions and experiences during relationship development. Tenure was a self-reported measure coded as the number of years an individual has been a member the organization. Archival data provided by the KPMG Foundation was also used to verify this measure.

Gender.

This variable was self-reported on the questionnaire. Gender was coded as 1 for women and 0 for men.

Primary Language.

This self-reported variable is in response to the question, “What do you consider to be your primary language?” This variable will be controlled for because the assumption is that if two people can communicate in the same language which is not understood by others in the group, in this case Spanish, they are more likely to develop a friendship relation. English was coded as 1 and Spanish was coded as 0.
Ethnicity.

This variable was self-reported on the questionnaire. African American was coded as 1 and Hispanic American was coded as 0.

Analysis

Descriptive statistics and correlations were run with all of the variables in this study (see Table 7). The ideal predictive situation exists if the correlations between the independent variables and the dependent variable are high and the correlations among the independent variables are low (Kerlinger, 1986: 541).

Correlations among the explanatory variables also raise the possibility of multicollinearity problems for the model. Multicollinearity, the presence of high correlation among independent variables, is an indication of instability of regression coefficients and other statistical difficulties (Kerlinger, 1986). I investigated the Variance Inflation Factors (VIFs) for all of the specifications estimated. The maximum VIF for variables in the model were below the rule of thumb cut-off value of ten for multiple regression models (Neter, Wasserman & Kutner, 1985).

The principal form of data analysis to test the hypotheses in this model were correlation analysis and ordinary least squares (OLS) regressions. OLS will yield estimated parameter estimates, of the effects of the independent variables on the dependent variable, equal to the underlying population parameter, i.e., $E(b) = B$.

Associated with this multiple regression is $R^2$, multiple correlation, which is the percent of variance in the dependent variable explained collectively by all of the independent variables. These parameters aid in the interpretation of the relationships empirically.
tested in this study. Each regression will included the control variables indicated in the Results section.
CHAPTER IV: RESULTS

Demographic profile

Table 7 presents means, standard deviations and inter-correlations among variables in this study. From these data, a demographic profile emerges. The average tenure for respondents in The PhD Project as of June, 2002 was a little over five years ($M = 5.29$, $s.d. = 1.44$) and had approximately 12 ($M = 12.01$, $s.d. = 9.82$) friendship relations. The sample consisted of 53% women and 47% men. 83% of the respondents were African American and 17% as Hispanic American. The majority of the population, 95%, indicated that English was their primary spoken language.

Structure versus Culture

The key exploration of this study investigates two competing explanations of the role of structure versus culture (as a proxy for ethnicity) in the formation of friendships. Specifically, are friendship choices determined by the shared cultural values of an ethnic group or are they determined by numerical ratios within an organization? I hypothesized that relative to Hispanic Americans, African Americans, as the more culturally cohesive group, would tend to form more homophilous groups in order to test the cultural hypothesis (H1a). I alternatively hypothesized that relative to African Americans, Hispanic Americans, as the numerically rarer group, would tend to form more homophilous groups in order to test the structural hypothesis. Referring to Table 8, I found that there was strong support for the structural hypothesis (H1b). Hispanic Americans, the numeric minority in the group, tended to make friends with same-ethnicity others. By contrast, African Americans, the more culturally similar group, were less likely to make friends with other African Americans.
That is not to say that African Americans did not make friends with same ethnicity others at all. African Americans tended to be slightly homophilous; the mean homophily was equal to .04 with a standard deviation of .07. The t-test value of 5.04 was significant at p < .001. Hispanic Americans, however, displayed a greater tendency to form homophilous relationships; the mean homophily score was equal to .37 with a standard deviation of .30. The t-test value of 5.11 was significant at p < .001. An independent samples t-test was run to compare the means of the two groups. The two groups significantly differed from each other (t = 9.10, p < .001).

This hypothesis was also supported by the correlation analysis. Ethnicity was significantly related to homophily (r = -.67, p < .001). A hierarchical regression was performed to examine if this significant relationship was maintained. As Table 8 reveals, the structurally based hypothesis was strongly supported by the analysis. Hispanic Americans formed more homophilous relationships than African Americans. The significant and negative regression coefficient for ethnicity (b = -.56, p < .001) in model 3 shows that even after controlling for tenure (b = .05, ns), gender (b = -.09, ns) and primary language (b = -.19, p < .05), Hispanic Americans were more likely to form homophilous relationships than African Americans. Model 3 was significant with an F-value of 19.10, p < .001 accounting for 49% of the variance.

This key finding strongly supports the structural perspective as a predictor of cohesive friendship formation. Although friendships in this organization were formed based on a shared cultural heritage, the cohesion of numerically rarer groups is clearly the driving force in emergent relationships.
Centrality and Performance

Another question posed by this study is whether or not the position in an organization’s social structure impacts an individual’s performance. Does centrality in a friendship network result in the generation of publications and presentations as proxies for performance as an indicator of career success? Specifically, I hypothesized that the greater an individual’s centrality, the greater the number of publications that would be generated (H4a). Additionally, I hypothesized that the greater and individual’s centrality, the greater the number of presentations would be generated (H4b). Referring to Table 9, I found support for the hypothesis regarding presentations but not publications.

Publications

Correlation analysis did not support the relationship between publications and centrality ($r = .13$, ns). Models 1 and 2 in Table 9 summarize the results of the analysis of centrality as a predictor of the number of publications. This hypothesis is not supported in Model 2 where, after entering all of the control variables, centrality was not significant ($b = .06$, ns) nor was the model.

Presentations

Recall that it was hypothesized that the greater the centrality individual has in the friendship network, the more presentations that individual should generate. The correlation between presentations and centrality was positive and significant as predicted ($r = .34$, $p < .01$). Models 3 and 4 in Table 9 summarize the results of the analysis of centrality as a predictor of the number of presentations. The data in model 4 summarizes the results of the direct effect of centrality was significant ($b = .31$, $p < .01$) even after controlling for tenure ($b = .13$, ns), gender ($b = .12$, ns), primary language ($b = .09$, ns), ethnicity ($b = -.16$, ns) and
both dimensions of self-construal; interdependent ($b = -.09$, ns) and independent ($b = -.20$, $p < .10$). The model was significant ($F = 2.43$, $p < .05$) explaining 18% of the variance. This finding indicates that the more direct and indirect friends an individual has in his or her network, the more likely he or she is to generate presentations.

**Self-Construal and Perceived Stress**

Recall that previous cross-cultural research has found that self-construal impacts the perceived stress level of students (e.g., Cross, 1995). This research explores whether this relationship holds true in an academic organization that consists of two different ethnic groups. Specifically, it was hypothesized that the higher an individual’s interdependent self-construal, the more likely the individual is to experience perceived stress (H10a). In addition, it was hypothesized that the higher an individual’s independent self-construal, the less likely the individual is to experience perceived stress (H10b). Indeed, as shown in Table 10, the results of this research replicates the finding that students with interdependent self-construal tend to experience more perceived stress. The hypothesis regarding individuals with independent self-construals was not supported although the coefficient was in the direction as predicted.

The initial analysis of the correlation coefficient found that interdependent self-construal was positive and significant as predicted ($r = .30$, $p < .01$). In Table 10, model 3, interdependent self-construal was added to the baseline model 2 and was found to be positive and significant ($b = .27$, $p < .05$) as predicted even after controlling for tenure ($b = -.21$, $p < .10$), gender ($b = .11$, ns), primary language ($b = -.22$, $p < .10$), ethnicity ($b = -.07$, ns), and centrality ($b = .11$, ns). The model was also significant ($F = 2.91$, $p < .05$) explaining 19% of the variance.
The initial analysis of the correlation coefficient found that independent self-construal was negative, as predicted, but not significant ($r = -.14$, ns). Table 10, model 4 summarizes the results of the analysis of independent self-construal as a predictor of perceived stress. The direct effect of independent self-construal was in the direction hypothesized but not significant ($b = -.16$, ns) after controlling for tenure, gender, primary language, ethnicity and both centrality measures. The model was marginally significant ($F = 2.03, p < .10$) due to the inclusion of tenure ($b = -.23, p < .10$) as one of the control variables.

The results of the analysis of the relationship between perceived stress and individuals in this academic organization replicate previous research that has explored the perceived stress levels of students in across countries. Higher levels of interdependent self-construal tend to increase the perceived stress levels of individuals in academic organizations.

**Perceived Network Value and Centrality**

This study explores whether or not an individual’s centrality in the friendship network impacts whether or not he or she perceives membership in that friendship network as valuable. Does centrality in the network shape that member’s belief in the value of the network? Specifically, I hypothesized that the greater an individual’s centrality in the friendship network, the more likely the individual will perceive the network as valuable (H6). The initial analysis of the correlation coefficient found that perceived network value was somewhat related to centrality in the direction as predicted ($r = .23, p < .05$).

Table 11, model 3 summarizes the results of the analysis of centrality as a predictor of perceived network value. The direct effect of centrality was positive and marginally significant ($b = .21, p < .10$) after controlling for tenure ($b = -.05, ns$), gender ($b = .29, p <$
primary language ($b = -.05$, ns), ethnicity ($b = .04$, ns), and both dimensions of self-construal: interdependent self-construal ($b = .30$, $p < .01$) and independent self-construal ($b = -.06$, ns). The model was significant ($F = 2.97$, $p < .01$) and explained 24% of the variance. This hypothesis was therefore somewhat supported at the $p < .10$ level.

The results of this analysis exploring the impact of an individual’s position in the friendship network on his or her perception of the value of that membership appears to have had an impact on how valuable an individual perceives the friendship network to be.

**Stress and Homophily**

A subsequent interesting and unexpected result concerned the proposition that the more same-ethnicity friendship relations that an individual develops, the less perceived stress he or she would experience (H7). More homophilous networks should result in lower levels of stress due to the ability to share experiences and garner empathy from others who are “like you.” I hypothesized that the more homophilous an individual’s friendship network, the more likely the individual will perceived the network as valuable.

The first indication that there was a relationship between these two variables was from the correlation; it was significant as predicted ($r = .21$, $p < .05$) but it was positive which was not predicted. The regression analysis in Table 12, summarizes the results of the analysis of homophily as a predictor of perceived stress. Even after controlling for both dimensions of self-construal, interdependent ($b = .27$, $p < .01$), independent ($b = -.09$, ns) and centrality ($b = .02$, ns), the direct effect of homophily was positive and significant ($b = .19$, $p < .05$). Model 3 was significant ($F = 3.68$, $p < .05$) but did not support my original hypothesis. It would appear that the more homophilous an individual’s friendship network, the more, not less, perceived stress an individual experiences.
Hypotheses not supported

Self-construal and Centrality

One of the research questions forwarded by this study proposed that personality could predict relationship development in a friendship network. Specifically, an individual with interdependent self-construal would make more friends than a person with independent self-construal. I hypothesized that the higher the interdependent self-construal, the higher the individual’s centrality in the friendship network (H2a). Additionally, I hypothesized that the higher the independent self-construal, the lower the individual’s centrality (H2b). As revealed in Table 13, the results did not support the hypothesized relationships. Model 3 was significant due only to the addition of tenure as a control variable ($b = .44, p < .001$).

Self-construal and Performance

Another research question explored by this study proposed that personality would predict an individual’s performance in this organization. An individual with independent self-construal would generate more publications and presentations (as proxies for performance) due to their proclivity to behave in such a manner that would allow them to focus on goal-directed, instrumental achievements. Specifically, I hypothesized that the higher an individual’s independent self-construal, the more publications would be generated (H9a). In addition, I hypothesized that the higher an individual’s independent self-construal, the more presentations would be generated (H9b). As revealed in Table 14, the results did not support the hypothesized relationships. Model 4, which summarizes the direct effect of independent self-construal on presentations, were marginally significant ($F = 2.03, p < .10$) due only to the addition of tenure as a control variable ($b = .24, p < .05$).
Homophily and Performance

A subsequent research question regarding performance proposed two competing hypotheses regarding the impact of homophily. On the one hand, it was proposed that homophily would increase the number of both publications and presentations due to the ease of interaction, the greater degree of trust and the willingness to share information. On the other hand, it was proposed that homophily would decrease the number of both publications and presentations due to the information redundancy generated by the sharing of similar point of view and lack of new idea generation. Specifically, I hypothesized that the more homophilous an individual’s friendship network, the greater the number of publications (H3a). In addition, I hypothesized that the more homophilous an individual’s network, the lower the number of publications (H3b). The same competing hypotheses were predicted for presentations (H3c and H3d). As revealed in Table 15, the results did not support any of the hypothesized relationships. Homophily had neither a positive nor a negative significant relationship with performance.

Homophily and Perceived Network Value

Homophily was also proposed as a predictor of perceived network value. Would an individual who was a member of a group of same-ethnicity others perceive their relationships in that network as valuable? Specifically, I hypothesized that the more homophilous and individual’s friendship network, the greater the likelihood that the individual would perceive the network as valuable (H5). As revealed in Table 16, the results did not support the hypothesis. The model was not significant and the regression coefficient was neither significant nor in the direction as predicted. It would appear that there is no relationship between homophily and perceived network value.
Centrality and Perceived Stress

Lastly, this study proposed that an individual’s position in the network would serve as an indication of whether or not he or she would feel more emotional support and companionship. Specifically, I hypothesized that the greater an individual’s centrality within the friendship network, the lower the level of perceived stress experienced by that individual (H8). The results summarized in Table 17 did not support this hypothesis. Model 3 was significant ($F = 2.64, p < .05$) due only to the addition of tenure ($b = -.23, p < .10$) and interdependent self-construal ($b = .25, p < .05$) as control variables. There is no relationship, in this study, between centrality and perceived stress.

The results of all hypothesized relationships in this study are summarized in Table 18. Some of the underlying assumptions regarding relationships in the friendship network were supported and many were not. Chapter 5 will discuss the supported relationships further and explore some reasons behind the unsupported propositions.
CHAPTER V: DISCUSSION

Findings

Structure versus Culture

It is not unusual to walk into an organization’s cafeteria and see segregated tables of African Americans or Hispanic Americans eating lunch together as friends. It is not unusual because, for the most part, it is a common occurrence to which we have become accustomed. It is “the routinized taken-for-granted world of everyday life” (Garfinkel, 1967). The assumption is that individuals in these groups have something in common such as a similarity of culture or ethnicity.

There already exists evidence that demographically similar others will develop friendships within organizations (e.g., Marsden & Hurlbert, 1988). This propensity results in more cohesive friendship ties among members of minority groups than members of majority groups. In this study I empirically test two reasons for this phenomenon – structure versus culture. The structural explanation is strongly supported such that the numerically rarer group, Hispanic Americans, are more homophilous than the more culturally similar group, African Americans. Overall, this critical finding in my study provides support for the structural explanation for friendship formation but extends the linkage even further.

Members of a given ethnic group are likely to form friendships simply because there are so few similar others that salience becomes the structural reason that drives friendship formation (Mehra, Kilduff & Brass, 1998). The structural perspective is supported not only for minorities within a dominant majority organization but is also supported when the entire population under study consists of what are normally underrepresented groups in the broader organization. Distinctiveness theory (McGuire, 1978), used to test the structural hypothesis
in this study, was strongly supported. It is the salience of a person’s attributes that draws him or her to a relationship even within a group of all-minority participants.

That the numeric minority in this study, Hispanic Americans, formed a more homophilous friendship network than the African Americans, who outnumbered them by a five-to-one ratio, is a significant finding. One of the two alternative hypotheses regarding homophily proposed that cultural identity would be the driving force in the formation of friendships. Research that has previously treated all minorities as one undifferentiated group may have done so under the assumption that what bound them together in mixed race organizations was a shared cultural identity. These studies tended to ignore the possibility that members of one ethnic group may have had experiences that differed from members of another ethnic group (Cox & Nkomo, 1993). This research studied an organization that consisted of two ethnic groups to determine if shared culture as a basis for cohesive friendship development would be supported.

One is moved to wonder why culture was not supported. First, perhaps African Americans do not cling to the shared history of slavery and oppression as a basis of relationship development as some might believe. For example, some African Americans may feel it is counterproductive to the goal of economic equality to dwell on the issue of retribution for slavery. In fact, it may be that the history of slavery in America is such a sensitive and painful part of African Americans’ national consciousness that it is purposefully not used as a basis for bonding. This would be in opposition to, for example, the Jewish experience. The Holocaust, as presented by The Holocaust Museum, is used by many as a painful and tragic event that is chosen as a rallying cry to remember what
happened and ensure that it does not happen again. There is no such national, physical symbol for African Americans; it remains part of a collective consciousness.

Second, African Americans have a history in the United States that has, in the last few decades, provided the opportunity for differing socio-economic classifications and political categorizations such that it is not possible for an African American to bond with another African American just because they are both African Americans. The cultural roadmap (Ferdman, 1995) of the African American is no longer pointing down one road. African Americans today are either becoming increasingly economically successful and building and living in mid-to-upper class neighborhoods or they remain segregated in lower income enclaves. They are represented today in the Republican party and in top governing positions in growing numbers and that was not the case until recently. Based on the respondents in this study alone, ten years ago, African Americans were less than one-tenth of one percent of the business school faculty in the United States and that number has at least quadrupled as of 2001. Having “African American” as an ethnic identity no longer provides as strong a common basis for friendship formation as was once thought.

In the opening paragraph of this section, I note the phenomenon of African Americans or Hispanic Americans eating together in the cafeteria, segregated from the rest of the organization’s members. This phenomenon can now be viewed through the lens of structural perspective: they most likely bonded due to the salience of their limited numbers. In an informal situation such as a meal, they may resort to self-segregation due to feelings of ease and comfort; for a small part of their day, there is no need to assume a separate professional identity (Bell, 1990). Their relationship formation behavior is dictated not by
how others see them (as the culturally or ethnically different minority) but how they see themselves (as the numeric minority).

Centrality and Performance

The results of this analysis have addressed whether or not an individual’s position in the friendship network impacts an individual’s performance. It was found that both the number of friends an individual possess and the number of indirect friends an individual in the friendship network has directly effects the number of presentations generated but not the number of publications. Consistent with previous findings, position in informal networks impacts individual performance even in academic organizations.

Relationship formation behavior and individual performance is therefore the basis of another key finding in this study. The number of direct friendship relations and the ensuing number of indirect friendships that an individual develops in this organization is directly related to the number of presentations he or she generates but not publications. This access to the center of the friendship network is beneficial in obtaining information regarding what opportunities exist to present one’s research. This suggests that more information is flowing between friends in the organization regarding potential opportunities to present research and get feedback for future, potential publications. It is not surprising that there is not yet a direct relationship between centrality and publications since getting an article published is itself a long-term process. It takes approximately eighteen months to two years for an article to be submitted and finally published.

Although a replication of previous research in academia (Baldwin, Bedell & Johnson, 1997), my findings further explore the linkage between centrality and performance in academia. There are two contributions of this study regarding the link between centrality and
performance. The first contribution is that significant results were found in an all-minority friendship network whose members are in different academic institutions. The implication here is powerful – it is that these members now have yet another venue within which to collaborate. They may now have potential collaborators in other institutions who may or may not be in the minority. This avenue for creating a web of research collaborators across the United States does not exist for doctoral students who do not belong to The PhD Project.

The second contribution is that this portion of the study is longitudinal. The data collected for the performance indicators was from publicly available and verifiable sources two years after the self-reported relationship network data was obtained. The link between centrality and performance may not have been supported if both measures were collected simultaneously.

Self-Construal and Perceived Stress

Previous research on self-construal and perceived stress is replicated in this study. Higher levels of interdependent self-construal tends to increase the perceived stress levels of individuals in academic organizations. Students with higher levels of interdependent self-construal may experience stress because of not having the direct coping strategies of individuals with higher levels of independent self-construal (Oetzel, 1998). In The PhD Project, where the stated objective is to provide support and networking opportunities, students with interdependent self-construals have both the skill set to develop supportive relationships via their communication behaviors and the desire to make relationships a central part of their experience. Maintaining connections to others means being constantly aware of others and focusing on their needs, desires and goals. Unfortunately, it may be that the interdependents’ objectives are time and energy consuming thus taking away those
needed resources from the key reason that they are a part of the organization – completing their dissertation. This tension between building relationships and conducting research is likely to cause the perceived stress.

Although there is not yet theoretical or empirical support for the hypothesis, I proposed individuals with independent self-construal would experience less perceived stress. This was not supported by the data. The regression coefficient was in the direction as predicted but it was not significant. One possible reason for the lack of support for this hypothesis is that the independent dimension of self-construal has not been, for much of the research in the social-psychological stream of literature, as well supported as the interdependent dimension. The newer version of the Self-construal Scale is purported to resolve that problem. Revisiting cultural differences in ethnic group relationship behavior might be better measured by the use of the updated Self-construal scale or the use of a new measure. The Relational-interdependent self-construal scale (RISC), which measures the tendency to think of oneself in terms of relationships with close others was designed to be appropriate for Western (individualistic) populations (Cross, Bacon & Morris, 2000).

Perceived Network Value and Centrality

The results of this analysis exploring the impact of an individual’s position in the friendship network on his or her perception of the value of that membership indicated that centrality had a marginal impact on how valuable an individual perceived the friendship network to be. How well connected an individual is to other well-connected individuals may lead an individual into thinking about the value of the friendship network. Consider how the value of a position in a network is a function of the value of the positions to which it is

---

*a Email dated April 1, 2002 to author from Dr. Theodore Singelis*
connected (Bonacich, Holdren & Johnston, 2002). For example, Friedman’s (1998) finding that more friendship ties provide more social support and that more support increased individuals’ satisfaction with the network of relationships. That satisfaction has a positive impact on the member’s perceptions of a valuable career. Knowing that the network consists of being able to tap into the web of related networks (the friend’s friends) would increase the perception of the network being valuable to a successful career.

Stress and Homophily

An interesting and unexpected finding resulted from the analysis of the relationship between stress and homophily. I hypothesized that more homophilous networks should result in lower levels of stress due to the ability to share experiences and garner empathy from others who are “like you.” However, more homophilous networks resulted in increased perceived levels of stress contrary to my proposition. One reason for this finding may be based on the theoretical perspective of the effects of proportions on group interactions (Kanter, 1977b). Hispanic Americans, the numerically distinct and more homophilous group, are the tokens in this organization who capture a disproportionate share of attention from the majority group. This visibility generates performance pressures since the “spotlight” is on them; note how, in Kanter’s examples of the X’s and O’s, the O’s tend to garner the attention of the X’s.

As one Hispanic American noted during PhD conference, “Sometimes I felt like the whole world was watching me, waiting for me to finish and not realizing exactly what it was I was going through. I felt that I couldn’t fail or it would look bad for the rest of us.”

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a As told to the members of The PhD Project at the AOM conference August, 2001.
would appear that the more homophilous an individual’s friendship network, the more, not less, perceived stress an individual experiences.

Self-Construal and Centrality

The predictions that self-construal would tend to determine whether or not an individual has more or less friendships or be more or less embedded in the friendship network was not supported. This suggests one of three things. First, while the self-construal measure tends to be a strong reliable predictor of communication behaviors in cross-cultural research where students are from both individualistic and collectivistic countries, it may predict other cultural behaviors such as relationship development in those settings. Second, it may not predict cultural behavioral differences between two ethnic groups within one country. That may be problematic due to the effects of acculturation (and thus little variance in the anticipated culturally based responses) or the similarity of the population demographics. For example, the respondents in this sample offer little variation in terms of primary language spoken, place of birth, educational experience and work experience. Third, the measure itself has moderate validity and reliability. It has been updated to improve its validity and reliability but that occurred after the data collection for this study. I recommend that future studies examining the relationship between personality and culturally different interaction behaviors use the updated self-construal measure.

Independent Self-construal and Performance

The research question explored by this study that proposed personality as a predictor of an individual’s performance was not supported in this study. Specifically, an individual with independent self-construal would generate more publications and presentations (as proxies for performance) due to their proclivity to behave in such a manner that would allow
them to focus on goal-directed, instrumental achievements. Independents view themselves as autonomous entities whose personal interests are more important than the interests of others. This perspective is not conducive to increasing either publications or presentations which frequently require collaboration and cooperation during research. In addition, independents value personal success over the success of joint efforts (teamwork) which might discourage co-authors from engaging in a research project with them.

Homophily and Performance

A subsequent research question regarding performance proposed two competing hypotheses regarding the impact of homophily. On the one hand, it was proposed that homophily would increase the number of both publications and presentations due to the ease of interaction, the greater degree of trust and the willingness to share information. On the other hand, it was alternatively proposed that homophily would decrease the number of both publications and presentations due to the information redundancy generated by the sharing of similar points of view and lack of new idea generation. The proposed links in this study were not supported by the analysis. In academia, it could be that demographic similarity does not impact productivity in either direction because research in business education has yet to explore this topic extensively. Research may have more to do with what each individual has to contribute to a research stream rather than how similar, or dissimilar, they are demographically.

Homophily and Perceived Network Value

Homophily was also proposed as a predictor of perceived network value. Would an individual who was a member of a group of same-ethnicity others perceive their relationships in that network as valuable? The results did not support the hypothesis. It would appear that
there is no relationship between homophily and perceived network value. Whether or not an individual tends to make same-ethnicity friends appears to have no bearing on his or her perception how much value the friendship network provides.

The PhD Project sample population of minority doctoral students have come together specifically to achieve the touted benefits of belonging to this network – to support one another both instrumentally and expressively. Friendships that have evolved as a result of the interactions during meetings and social activities may have indeed resulted in a perception that networks are valuable but that perception may not have been a conscious one. When faced with the survey question about the value of the network, that sub-conscious perception may not have surfaced. In fact, the value of the network may not become clear to the respondent until the instrumental value of it, e.g., a publication or job, comes to fruition. This would require a more logitudinal approach in the future to collect the perceptions.

Centrality and Perceived Stress

Lastly, this study proposed that an individual’s position in the network would serve as an indication of the level of perceived stress experienced. The results did not support this hypothesis. There was no relationship between the centrality and perceived stress. One reason why the size of an individual’s network might not impact perceived stress is that the quality of the relationships is what is driving a reduction of stress. Individuals may feel reduced stress by virtue of fewer, more supportive relationships rather than many superficial ones. The quality of the relationships experienced and subsequent linkages to stress is an area for future research to consider.
Limitations

First, the use of self-construal in this study was based on its prior contribution as an explanatory factor. It could be that in research on macro-micro analysis that self-construal, or any other personality variable, is not the cause of relationship behavior but the consequence of the social forces in the a network. The self not only influences social behavior but is also a product of social forces (Cooley, 1902; Mead, 1934; Rosenberg, 1981). Perhaps this issue of causality is one of the reasons why the linkages between self-construal and centrality or performance were not significant.

Second, there are those who may believe that the external validity of this study is limited by the demographic makeup of the sample population. The demographic configuration of this organization may limit the generalizability of the results to settings where the population consists of Caucasians in the majority and ethnic groups in the minority. However, I purposely chose this site to allow me the opportunity to study an atypical organization where an empirical testing of competing hypotheses regarding the structural versus cultural explanations of friendship choices could be conducted.

Third, the cross-sectional design approach adopted in this research may not be best suited for attempting to determine if personality is a factor in where an individual is positioned in his or her social network. The specific methodological limitation in cross-sectional designs is that causal relationships are difficult to untangle. For example, in this study, rather than homophily producing greater or fewer publications, it is possible that publications preceded the development of those relationships. In order to obtain valid and reliable results for a subsequent network study, it would be better to examine the development of networks among new members by collecting network data over time.
Fourth, the use of self-report data threatens the internal validity of the study in all of the hypotheses with the exception of the performance measures. This is not true for the performance measures, publications and presentations, because that data was collected from archival sources two years after the initial data was collected. Nevertheless, self-reported measures may not provide accurate information about the participants. This is especially true for the respondents in this study who may have a more heightened sense of cultural awareness or ethnic identity issues upon receiving, as well as while completing, the questionnaire.

Fifth, network research is often criticized because it does not collect multiple items for assessing the reliability of the network measures but repeating the roster method used in this study with multiple items would be time-consuming for the respondents and costly to collect. As noted, although this may be a valid criticism, research suggests that single-time network measures are reliable when the roster method is used to aid in the recall of respondents (Marsden, 1990).

Managerial Implications and Future Research

Many organizations are not prepared to cope with the challenges that increasing workforce diversity poses (Milton, 1998) and that includes academic institutions. Even less is known about how members of different demographics work together (Cox, Lobel & McLeod, 1991). Organizations that learn to manage and retain diverse workforces may reap major benefits while those who fail may pay the costs associated with attraction and retention (Cox, 1993). A recent study (Moore, 1995) found that even organizations considered to be multicultural leaders were not planning to introduce new initiative for managing diversity. The PhD Project is an example of how friendship networks can cut across organizational
boundaries for typically underrepresented groups in order to provide both psychosocial and instrumental support. The number of African American and Hispanic American academics in business schools has increased fourfold in less than a decade and this is attributable mainly to The PhD Project’s success in recruiting and maintaining this population. The implication of this success is that organizations may want to re-examine their diversity initiatives to include the purposeful creation of segregated support networks.

Future research needs to assess the current approaches to diversity and focus on theoretically driven and empirically substantiated criteria for developing alternative causes of action. This study has contributed to the research that examines the role of ethnicity as an origin of friendship networks in an academic organization. From the perspective of the structural explanation of friendship formation, it is the relative numbers of minorities and majorities within a specific organizational context that makes a difference. Based on the results of this study, the formation of separate support groups where individuals develop more social ties might positively impact individual performance and, hence, organizational success.

This study has found an instrumental advantage to where an individual is located in the social structure of a friendship network that has members that have cross-organizational ties. Performance appears to accrue to those individuals who are connected to well-connected others. What this implies for organizations is that the creation or encouragement of a cross-organizational support network would be beneficial to both the individual and the organization in terms of increased performance. For these respondents, increased presentations and publications enhance the individual’s vita and, therefore, future chances of
success. For the organizations, successful doctoral students build the reputation of the originating institution.

The role of homophily and stress could be an important explanation of why individuals in all-minority organizations might tend to experience more perceived stress; organizations should be researched to ensure that they are aware of the practical intent of their objectives. It might not be ideal to encourage the formation of ethnically homophilous informal networks if the objective is to provide psychosocial support.

Lastly, this research has attempted to add to the stream of literature that explores the role of self in the complex web of informal networks in organizations. The self is a dynamic, cultural creation. Individuals’ self-view, emotions and motivations take shape within a framework provided by cultural values, ideals, practices and structures (Cross & Madison, 1997). Weber (1968) also believed that social structures and positions helped shape values attitudes and beliefs. Where a cultural approach emphasizes the importance of shared values and beliefs in determining socially patterned behavior, a structural approach emphasizes the influence that socially patterned behavior has on shared values and beliefs (House & Mortimer, 1990). Future research delving further into which of the two forces, personality or social structure, drives the type of relationships that are most effective in organizations may bring additional insight to this stream of literature.

Conclusion

This study has provided a previously unexplored origin of friendship relations in the management literature. Structural theory is supported in an across-organization association of all-minority members in a friendship network. In addition, I have explored the role of the friendship network in instrumental outcomes; traditionally, this has been examined in
conjunction with other types of networks such as advice, task support and communication networks.

Although findings were generally insignificant with respect to the personality construct, there are several potential future avenues of research now that the validity and reliability of the measure has since been improved. In addition, individual-level cross-cultural personality theory is still in its early stages in the social psychological literature and opportunities have been pointed out in this research where future contributions could be made. This is a promising area for management research.

Although no formal hypotheses were presented, the examination of the friendship network within an all-minority network will provide an interesting comparison to past studies of more traditional organizations. Propositions may now be developed about when ethnic minorities become the majority in an organization. In addition, based on this study, propositions regarding the differences between minority groups may emerge from further studies.
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of Sociology, 94, S95-S120.


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FIGURE A: MODEL

ANTECEDENTS

Ethnicity

- African Americans
  - H1a +

- Hispanic Americans
  - H1b +

Personality

- Self-Construal
  - Interdependent
  - Independent
  - H2a +
  - H2b

CONSEQUENCES

Friendship Network
Nature of Social Ties

- Ethnic Homophily
  - H3a +
  - H3b -
  - H3c +
  - H3d -

Performance
Publications
Presentations

- H2a +
- H4a +
- H4b +
- H5 +
- H6 +
- H7 -
- H8 -

Network Value

Stress

- H10 a +
- H10b -
### Table 1: Milestones in data collection

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestone</th>
<th>Cumulative Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 28, 2000</td>
<td>Pre-test of questionnaire with Universal Orientation Scale:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 10 students</td>
<td></td>
</tr>
<tr>
<td>March 25, 2000</td>
<td>Pilot test of final version of questionnaire:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 10 current PhD Project members</td>
<td></td>
</tr>
<tr>
<td>April 24, 2000</td>
<td>Mailed out 151 surveys</td>
<td></td>
</tr>
<tr>
<td>May 4, 2000</td>
<td>Mailed out follow up postcards</td>
<td>19 questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12.6% response rate)</td>
</tr>
<tr>
<td>May 5, 2000</td>
<td>Mailed out follow up postcards</td>
<td>19 questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(25.6% response rate)</td>
</tr>
<tr>
<td>May 18, 2000</td>
<td>Phone call follow ups</td>
<td>19 questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(25.6% response rate)</td>
</tr>
<tr>
<td>May 22, 2000</td>
<td>Mailed follow up letters with another survey included</td>
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</tr>
<tr>
<td>June 5, 2000</td>
<td></td>
<td>17 questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(36.4% response rate)</td>
</tr>
<tr>
<td>June 6, 2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 15, 2000</td>
<td></td>
<td>22 questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(51.0% response rate)</td>
</tr>
<tr>
<td>July 17, 2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 31, 2000</td>
<td>Follow up emails sent out</td>
<td>10 questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(57.6% response rate)</td>
</tr>
<tr>
<td>August 6, 2000</td>
<td>Emphasized importance of questionnaire at conference</td>
<td>13 questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(66.2% response rate)</td>
</tr>
<tr>
<td>September 25, 2000</td>
<td>Final email to remaining non-respondents</td>
<td></td>
</tr>
<tr>
<td>November 8, 2000</td>
<td></td>
<td>11 questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(73.5 % response rate)</td>
</tr>
<tr>
<td>Final Total</td>
<td></td>
<td>111 questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>73.5 % response rate</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Organization</td>
<td>Sample</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>African Americans</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>55</td>
<td>37</td>
</tr>
<tr>
<td>Women</td>
<td>66</td>
<td>49</td>
</tr>
<tr>
<td><strong>Total African Americans</strong></td>
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<td>86</td>
</tr>
<tr>
<td><strong>Hispanic Americans</strong></td>
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<td></td>
</tr>
<tr>
<td>Men</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Women</td>
<td>12</td>
<td>7</td>
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<tr>
<td><strong>Total Hispanic Americans</strong></td>
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<td>17</td>
</tr>
<tr>
<td><strong>Native Americans</strong></td>
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<td>Men</td>
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<tr>
<td>Women</td>
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<tr>
<td><strong>Total Native Americans</strong></td>
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<tr>
<td><strong>Asian Americans</strong></td>
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<td>1</td>
</tr>
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<td>Women</td>
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<td><strong>Total Asian Americas</strong></td>
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<td>1</td>
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<tr>
<td><strong>Others</strong></td>
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<td>Men</td>
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<td>Women</td>
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</tr>
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<td><strong>Total Others</strong></td>
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<td>0</td>
</tr>
<tr>
<td><strong>Total Sample</strong></td>
<td>151</td>
<td>111</td>
</tr>
</tbody>
</table>
Table 3: Initial Response Rates by Gender and Ethnicity

<table>
<thead>
<tr>
<th></th>
<th>Organization</th>
<th>Sample</th>
<th>Response %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>55</td>
<td>37</td>
<td>67.3</td>
</tr>
<tr>
<td>Hispanic American</td>
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<tr>
<td>Native Americans</td>
<td>3</td>
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<td>100.0</td>
</tr>
<tr>
<td>Asian Americans</td>
<td>1</td>
<td>1</td>
<td>100.0</td>
</tr>
<tr>
<td>Others</td>
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<td>2</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total Men</strong></td>
<td>71</td>
<td>53</td>
<td>74.6</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>66</td>
<td>49</td>
<td>74.2</td>
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<td>100.0</td>
</tr>
<tr>
<td>Asian Americans</td>
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<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
<td>0</td>
<td>-</td>
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<tr>
<td><strong>Total Women</strong></td>
<td>80</td>
<td>58</td>
<td>72.5</td>
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<tr>
<td><strong>Ethnicity</strong></td>
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<td>121</td>
<td>86</td>
<td>71.1</td>
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<td>22</td>
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<td>Asian Americans</td>
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<td>100.0</td>
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<td>Others</td>
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<td>2</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total by Ethnicity</strong></td>
<td>151</td>
<td>111</td>
<td>73.5</td>
</tr>
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</table>
### Table 4: Final Response Rates by Ethnicity and Gender

<table>
<thead>
<tr>
<th>Organization</th>
<th>Sample</th>
<th>Response %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>African Americans</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>55</td>
<td>37</td>
</tr>
<tr>
<td>Women</td>
<td>66</td>
<td>49</td>
</tr>
<tr>
<td>Total African Americans</td>
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<td>86</td>
</tr>
<tr>
<td><strong>Hispanic Americans</strong></td>
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<td></td>
</tr>
<tr>
<td>Men</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Women</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Total Hispanic Americans</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total Sample</strong></td>
<td>143</td>
<td>103</td>
</tr>
</tbody>
</table>

### Table 5: Final Response Rates by Gender and Ethnicity

<table>
<thead>
<tr>
<th>Organization</th>
<th>Sample</th>
<th>Response %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>55</td>
<td>37</td>
</tr>
<tr>
<td>Hispanic American</td>
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<td>10</td>
</tr>
<tr>
<td>Total Men</td>
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<td>47</td>
</tr>
<tr>
<td><strong>Women</strong></td>
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<td></td>
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<tr>
<td>African American</td>
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<td>49</td>
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<td>Hispanic American</td>
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<td>Total Women</td>
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<td><strong>Total Sample</strong></td>
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<td>103</td>
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Table 6: Summary of research variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tenure</td>
<td>Based on the number of years the respondent has been a participant of the PhD Project.</td>
</tr>
<tr>
<td>2. Gender</td>
<td>Dummy variable coded as 1 for Women and 0 for Men</td>
</tr>
<tr>
<td>3. Primary Language</td>
<td>Dummy variable coded as 1 for English and 0 for Spanish</td>
</tr>
<tr>
<td>4. Ethnicity</td>
<td>Dummy variable coded as 1 for African Americans and 0 for Hispanic Americans</td>
</tr>
<tr>
<td>5. Homophily</td>
<td>Based on homophily calculation (Krackhardt, 1990)</td>
</tr>
<tr>
<td>6. Self-construal</td>
<td>Based on responses to 24-item measure of the Self-Construal Scale (Singelis, 1994). See Appendix B for list of items.</td>
</tr>
<tr>
<td>7. Eigenvector Centrality</td>
<td>The summarized friendship matrix will be submitted to the eigenvector centrality procedure in the network program, UCINET 5.0 (Borgatti, Everett &amp; Freeman, 1999).</td>
</tr>
<tr>
<td>8. Publications</td>
<td>Based on the number of publications obtained from online databases</td>
</tr>
<tr>
<td>9. Presentations</td>
<td>Based on the number of presentations given at Academy of Management Conferences</td>
</tr>
<tr>
<td>10. Perceived Network Value</td>
<td>Based on a one-item measure of how valuable the respondent perceives the friendship network to be.</td>
</tr>
<tr>
<td>11. Perceived Stress</td>
<td>This four-item measure captures perceived psychological well-being (Cohen, Kamarck &amp; Mermelstein, 1983)</td>
</tr>
<tr>
<td>Variables</td>
<td>Mean</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------</td>
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<tr>
<td>PhD Project Tenure&lt;sup&gt;a&lt;/sup&gt;</td>
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</tr>
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<td>Gender&lt;sup&gt;b&lt;/sup&gt;</td>
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**Self Construal**

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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
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<td>-0.11</td>
<td>0.04</td>
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<td></td>
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<td>-0.19†</td>
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<td>Eigenvector</td>
<td>10.77</td>
<td>8.89</td>
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<td>-0.09</td>
<td>-0.14</td>
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<td>0.16</td>
<td>0.03</td>
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**Consequences**

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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
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<tbody>
<tr>
<td>Publications</td>
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<td>-0.22*</td>
<td>-0.05</td>
<td>-0.12</td>
<td>0.16</td>
<td>-0.09</td>
<td>0.11</td>
<td>0.13</td>
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<tr>
<td>Presentations</td>
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<td>0.26*</td>
<td>0.08</td>
<td>-0.05</td>
<td>-0.14</td>
<td>0.12</td>
<td>0.02</td>
<td>-0.17</td>
<td>0.34**</td>
<td>0.11</td>
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<td></td>
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<tr>
<td>Network Value</td>
<td>4.03</td>
<td>1.05</td>
<td>0.08</td>
<td>0.28**</td>
<td>-0.04</td>
<td>-0.02</td>
<td>-0.03</td>
<td>0.35**</td>
<td>-0.09</td>
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<tr>
<td>Stress</td>
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<td>-0.20*</td>
<td>0.21*</td>
<td>0.30**</td>
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<td>0.09</td>
<td>-0.02</td>
<td>-0.03</td>
<td>0.10</td>
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</table>

† p < .10  * p < .05  ** p < .01  *** p < .001  
n = 103 except for Tenure (n = 84), Network Value (n= 90), and Stress (n = 101)  
a Tenure is in years  
b Gender: Male = 0, Female = 1  
c Primary Language: Spanish = 0, English = 1  
d Ethnicity: Hispanic Americans = 0, African Americans = 1
Table 8: Summary of Regression Analyses Predicting Homophily from Ethnicity

<table>
<thead>
<tr>
<th>Independent Variable</th>
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<td></td>
<td>1</td>
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<tr>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td>Tenure&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.13</td>
</tr>
<tr>
<td>Gender&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.17</td>
</tr>
<tr>
<td>Primary Language&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-.47***</td>
</tr>
</tbody>
</table>

Direct Effects

| Ethnicity<sup>d</sup>       | -.56***        |                 |

Model $F$

| Models         | 1.99           | 9.33***         | 19.10***        |

$\Delta F$

|               | 22.93          | 36.11           |

$R^2$

|               | .05            | .26             | .49             |

$\Delta R^2$

|               | .21            | .23             |

Adjusted $R^2$

|               | .02            | .23             | .47             |

Note: Values represent standardized regression coefficients

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

<sup>a</sup> Tenure is in years

<sup>b</sup> Gender: Male = 0, Female = 1

<sup>c</sup> Primary Language: Spanish = 0, English = 1

<sup>d</sup> Ethnicity: Hispanic Americans = 0, African Americans = 1
Table 9: Summary of Regression Analyses Predicting Performance from Centrality

<table>
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<tr>
<th>Independent Variable</th>
<th>Publications</th>
<th>Presentations</th>
</tr>
</thead>
<tbody>
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<td>1</td>
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</tr>
<tr>
<td>Controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure\textsuperscript{a}</td>
<td>.17</td>
<td>.15</td>
</tr>
<tr>
<td>Gender\textsuperscript{b}</td>
<td>-.22†</td>
<td>-.22†</td>
</tr>
<tr>
<td>Primary Language\textsuperscript{c}</td>
<td>.02</td>
<td>.02</td>
</tr>
<tr>
<td>Ethnicity\textsuperscript{d}</td>
<td>-.10</td>
<td>-.09</td>
</tr>
<tr>
<td>Self-Construal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interdependent</td>
<td>-.08</td>
<td>-.08</td>
</tr>
<tr>
<td>Independent</td>
<td>.15</td>
<td>-.14</td>
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<tr>
<td>Direct Effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eigenvector Centrality</td>
<td>.06</td>
<td></td>
</tr>
</tbody>
</table>

| Model F              | 1.57         | 1.37          | 1.72 | 2.43* |
| Δ F                  | .26          |               | 6.04 |      |
| R\textsuperscript{2}  | .11          | .11           | .12  | .18  |
| Δ R\textsuperscript{2} | .00         |               | .07  |      |
| Adjusted R\textsuperscript{2} | .04      | .03           | .05  | .11  |

\textit{Note:} Values represent standardized regression coefficients
\[† p < .10; * p < .05; ** p < .01; *** p < .001\]

\textsuperscript{a} Tenure is in years
\textsuperscript{b} Gender: Male = 0, Female = 1
\textsuperscript{c} Primary Language: Spanish = 0, English = 1
\textsuperscript{d} Ethnicity: Hispanic Americans = 0, African Americans = 1
Table 10: Summary of Regression Analyses Predicting Stress from Self-construal

<table>
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</tr>
</thead>
<tbody>
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<tr>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td>Tenure(^a)</td>
<td>-.14</td>
</tr>
<tr>
<td>Gender(^b)</td>
<td>.12</td>
</tr>
<tr>
<td>Primary Language(^c)</td>
<td>-.22(^†)</td>
</tr>
<tr>
<td>Ethnicity(^d)</td>
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</tr>
<tr>
<td>Eigenvector</td>
<td>.14</td>
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<tr>
<td>Direct Effects</td>
<td></td>
</tr>
<tr>
<td>Self-Construal</td>
<td></td>
</tr>
<tr>
<td>Interdependent</td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td></td>
</tr>
</tbody>
</table>

| Model F                      | 2.14\(^†\) | 1.99\(^†\) | 2.91\(^*\) | 2.03\(^†\) |
| Δ F                          | 1.38  | 6.76  | 2.05  |     |
| R\(^2\)                      | 10    | .12   | .19   | .14   |
| Δ R\(^2\)                    | .02   | .07   | .02   |     |
| Adjusted R\(^2\)             | .05   | .06   | .12   | .07   |

Note: Values represent standardized regression coefficients
\(^†\) p < .10; \(^*\) p < .05; \(^**\) p < .01; \(^***\) p < .001

\(^a\) Tenure is in years
\(^b\) Gender: Male = 0, Female = 1
\(^c\) Primary Language: Spanish = 0, English = 1
\(^d\) Ethnicity: Hispanic American = 0, African American = 1
Table 11: Summary of Regression Analyses Predicting Perceived Network Value from Centrality

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<th></th>
<th></th>
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</tr>
<tr>
<td>Tenure&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>.04</td>
<td>-.05</td>
<td></td>
</tr>
<tr>
<td>Gender&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.30*</td>
<td>.28*</td>
<td>.29*</td>
<td></td>
</tr>
<tr>
<td>Primary Language&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>-.05</td>
<td>-.05</td>
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</tr>
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<td>Ethnicity&lt;sup&gt;d&lt;/sup&gt;</td>
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<td>.02</td>
<td>.04</td>
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<tr>
<td>Self-construal</td>
<td></td>
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</tr>
<tr>
<td>Interdependent</td>
<td>.33**</td>
<td>.30**</td>
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<tr>
<td>Independent</td>
<td>-.03</td>
<td>-.06</td>
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<tr>
<td>Direct Effects</td>
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<tr>
<td>Eigenvector Centrality</td>
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<tr>
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<tbody>
<tr>
<td>Model F</td>
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<tr>
<td>R²</td>
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<td>Δ R²</td>
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<td>.04</td>
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</tr>
<tr>
<td>Adjusted R²</td>
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<td>.13</td>
<td>.16</td>
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</table>

Note: Values represent standardized regression coefficients
† p < .10; * p < .05; ** p < .01; *** p < .001

<sup>a</sup> Tenure is in years
<sup>b</sup> Gender: Male = 0, Female = 1
<sup>c</sup> Primary Language: Spanish = 0, English = 1
<sup>d</sup> Ethnicity: Hispanic American = 0, African American = 1
Table 12: Summary of Regression Analyses Predicting Perceived Stress from Homophily

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Note: Values represent standardized regression coefficients
† p < .10; * p < .05; ** p < .01; *** p < .001
Table 13: Summary of Regression Analyses Predicting Centrality Measures from Self-construal

<table>
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<td>Primary Language(^d)</td>
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<td>.04</td>
<td>.01</td>
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<td>Direct Effects</td>
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<td></td>
<td>Self-Construal</td>
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Model F

<table>
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<tr>
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<th>4.06**</th>
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<td>.20</td>
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<tr>
<td>(\Delta R^2)</td>
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<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted (R^2)</td>
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<td>.15</td>
<td>.16</td>
<td></td>
</tr>
</tbody>
</table>

Note: Values represent standardized regression coefficients
\(\dagger \) p < .10; * p < .05; ** p < .01; *** p < .001

---

\(^a\) Tenure is in years
\(^b\) Gender: Male = 0, Female = 1
\(^c\) Ethnicity: Hispanic American = 0, African American = 1
\(^d\) Primary Language: Spanish = 0, English = 1
Table 14: Summary of Regression Analyses Predicting Performance from Self-construal

<table>
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<th>Publications</th>
<th>Presentations</th>
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<td>.16</td>
</tr>
<tr>
<td>Gender(^b)</td>
<td></td>
<td>-.22(^†)</td>
<td>-.22(^*)</td>
</tr>
<tr>
<td>Primary Language(^c)</td>
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<td>.05</td>
<td>.02</td>
</tr>
<tr>
<td>Ethnicity(^d)</td>
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<td>-.09</td>
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<tr>
<td></td>
<td>Direct effects</td>
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<tr>
<td>Self-Construal</td>
<td>Independent</td>
<td>.16</td>
<td></td>
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<tr>
<td>Model F</td>
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<td>1.79</td>
<td>2.06(^†)</td>
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<td>(\Delta F)</td>
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<td>2.07</td>
<td></td>
</tr>
<tr>
<td>(R^2)</td>
<td>.08</td>
<td>.10</td>
<td>.09</td>
</tr>
<tr>
<td>(\Delta R^2)</td>
<td></td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Adjusted (R^2)</td>
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<td>.05</td>
<td>.05</td>
</tr>
</tbody>
</table>

Note: Values represent standardized regression coefficients; \(n = 103\)
\(^†\) \(p < .10\); \(^*\) \(p < .05\); \(^**\) \(p < .01\); \(^***\) \(p < .001\)

\(^a\) Tenure is in years
\(^b\) Gender: Male = 0, Female = 1
\(^c\) Primary Language: Spanish = 0, English = 1
\(^d\) Ethnicity: Hispanic American = 0, African American = 1
Table 15: Summary of Regression Analyses Predicting Performance from Homophily

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Publications</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Tenure (^a)</td>
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<td>.13</td>
</tr>
<tr>
<td>Gender (^b)</td>
<td>-.21(\dagger)</td>
<td>-.20(\dagger)</td>
</tr>
<tr>
<td>Primary Language (^c)</td>
<td>.05</td>
<td>.08</td>
</tr>
<tr>
<td>Ethnicity (^d)</td>
<td>-.11</td>
<td>-.05</td>
</tr>
</tbody>
</table>

Direct Effects

<table>
<thead>
<tr>
<th>Homophily</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.11</td>
</tr>
</tbody>
</table>

Model F  

<table>
<thead>
<tr>
<th>Model F</th>
<th>1.70</th>
<th>1.46</th>
<th>2.06(\dagger)</th>
<th>1.66</th>
</tr>
</thead>
</table>

\(\Delta F\)  

| \(\Delta F\) | .55 | .16 |

\(R^2\)  

| \(R^2\) | .08 | .09 | .09 | .10 |

\(\Delta R^2\)  

| \(\Delta R^2\) | .01 | .00 |

Adjusted \(R^2\)  

| Adjusted \(R^2\) | .03 | .03 | .05 | .04 |

Note: Values represent standardized regression coefficients  
\(\dagger p < .10; * p < .05; ** p < .01; *** p < .001\)

\(^a\) Tenure is in years  
\(^b\) Gender: Male = 0, Female = 1  
\(^c\) Primary Language: Spanish = 0, English = 1  
\(^d\) Ethnicity: Hispanic Americans = 0, African Americans = 1
Table 16: Summary of Regression Analyses Predicting Perceived Network Value from Homophily

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td></td>
</tr>
<tr>
<td>Tenure (^a)</td>
<td>.08</td>
</tr>
<tr>
<td>Gender (^b)</td>
<td>.29*</td>
</tr>
<tr>
<td>Primary Language (^c)</td>
<td>-.07</td>
</tr>
<tr>
<td>Ethnicity (^d)</td>
<td>-.01</td>
</tr>
<tr>
<td><strong>Direct Effects</strong></td>
<td></td>
</tr>
<tr>
<td>Homophily</td>
<td>-.04</td>
</tr>
</tbody>
</table>

| Model F                | 1.83   | 1.45   |
| ∆ Model F              |        | .06    |
| R²                     | .09    | .10    |
| ∆ R²                   |        | .00    |
| Adjusted R²            | .04    | .03    |

**Note:** Values represent standardized regression coefficients

\(^{†}\) p < .10; \(\ast\) p < .05; \(\ast\ast\) p < .01; \(\ast\ast\ast\) p < .001

\(^a\) Tenure is in years

\(^b\) Gender: Male = 0, Female = 1

\(^c\) Primary Language: Spanish = 0, English = 1

\(^d\) Ethnicity: Hispanic Americans = 0, African Americans = 1
<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Models</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure\textsuperscript{a}</td>
<td>-.14</td>
<td>-.18\text{†}</td>
<td>-.23\text{†}</td>
<td></td>
</tr>
<tr>
<td>Gender\textsuperscript{b}</td>
<td>.12</td>
<td>.11</td>
<td>.11</td>
<td></td>
</tr>
<tr>
<td>Primary Language\textsuperscript{c}</td>
<td>-.22\text{†}</td>
<td>-.20</td>
<td>-.20</td>
<td></td>
</tr>
<tr>
<td>Ethnicity\textsuperscript{d}</td>
<td>-.11</td>
<td>-.10</td>
<td>-.09</td>
<td></td>
</tr>
<tr>
<td><strong>Self-Construal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interdependent</td>
<td>.27\text{*}</td>
<td>.25\text{*}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td>-.10</td>
<td>-.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Direct Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eigenvector Centrality</td>
<td>.12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Model F              | 2.14\text{†} | 2.89\text{*} | 2.64\text{*} |            |
| Δ F                  | 4.05         | 1.11        |            |            |
| R²                   | .10          | .19         | .20        |            |
| Δ R²                 | .09          | .01         |            |            |
| Adjusted R²          | .05          | .12         | .12        |            |

**Note:** Values represent standardized regression coefficients
\text{†} p < .10; \text{*} p < .05; \text{**} p < .01; \text{***} p < .001

\textsuperscript{a} Tenure is in years
\textsuperscript{b} Gender: Male = 0, Female = 1
\textsuperscript{c} Primary Language: Spanish = 0, English = 1
\textsuperscript{d} Ethnicity: Hispanic American = 0, African American = 1
Table 18: Summary of Results

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Regression Equation</th>
<th>Supported</th>
<th>Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a: Relative to Hispanic Americans, African Americans will tend to form more homophilous friendship networks.</td>
<td>DV: Ethnic Homophily IV: Ethnicity CV: Tenure, Gender, Primary Language</td>
<td>No</td>
<td>8</td>
</tr>
<tr>
<td>1b: Relative to African Americans, Hispanic Americans will tend to form more homophilous friendship networks.</td>
<td>DV: Ethnic Homophily IV: Ethnicity CV: Tenure, Gender, Primary Language</td>
<td>Yes</td>
<td>8</td>
</tr>
<tr>
<td>2a: The higher the interdependent self-construal, the higher the individual’s centrality in the friendship network.</td>
<td>DV: Eigenvector Centrality IV: Interdependent SC CV: Tenure, Gender, Ethnicity, Primary Language</td>
<td>No</td>
<td>13</td>
</tr>
<tr>
<td>2b: The higher the independent self-construal, the lower the individual’s centrality in the friendship network.</td>
<td>DV: Eigenvector Centrality IV: Independent SC CV: Tenure, Gender, Ethnicity, Primary Language</td>
<td>No</td>
<td>13</td>
</tr>
<tr>
<td>3a: The more homophilous an individual’s friendship network, the greater the number of publications.</td>
<td>DV: Publications IV: Ethnic Homophily CV: Tenure, Gender, Ethnicity, Primary Language</td>
<td>No</td>
<td>15</td>
</tr>
<tr>
<td>3b: The more homophilous an individual’s friendship network, the lower the number of publications.</td>
<td>DV: Publications IV: Ethnic Homophily CV: Tenure, Gender, Ethnicity, Primary Language</td>
<td>No</td>
<td>15</td>
</tr>
<tr>
<td>3c: The more homophilous an individual’s friendship network, the greater the number of presentations.</td>
<td>DV: Presentations IV: Ethnic Homophily CV: Tenure, Gender, Ethnicity, Primary Language</td>
<td>No</td>
<td>15</td>
</tr>
<tr>
<td>3d: The more homophilous an individual’s friendship network, the lower the number of presentations.</td>
<td>DV: Presentations IV: Ethnic Homophily CV: Tenure, Gender, Ethnicity, Primary Language</td>
<td>No</td>
<td>15</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>Regression Equation</td>
<td>Supported</td>
<td>Table</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
</tr>
<tr>
<td>4a: The greater an individual’s centrality within the friendship network, the greater the number of publications.</td>
<td>DV: Publications IV: Eigenvector Centrality CV: Tenure, Gender, Primary Language, Ethnicity, Interdependent SC, Independent SC</td>
<td>No</td>
<td>9</td>
</tr>
<tr>
<td>4b: The greater an individual’s degree centrality within the friendship network, the greater the number of presentations.</td>
<td>DV: Presentations IV: Eigenvector Centrality CV: Tenure, Gender, Primary Language, Ethnicity, Interdependent SC, Independent SC</td>
<td>Yes</td>
<td>9</td>
</tr>
<tr>
<td>5: The more homophilous an individual’s friendship network, the greater the likelihood that an individual will perceive the network as valuable.</td>
<td>DV: Perceived Network Value IV: Ethnic Homophily CV: Tenure, Gender, Primary Language, Ethnicity</td>
<td>No</td>
<td>16</td>
</tr>
<tr>
<td>6: The greater an individual’s centrality in the friendship network, the more likely the individual will perceive the network as valuable.</td>
<td>DV: Network Value IV: Eigenvector Centrality CV: Tenure, Gender, Primary Language, Ethnicity, Interdependent SC, Independent SC</td>
<td>Yes</td>
<td>11</td>
</tr>
<tr>
<td>7: The more homophilous an individual’s friendship network, the lower the level of perceived stress experienced by the individual.</td>
<td>DV: Stress IV: Ethnic Homophily CV: Interdependent SC, Independent SC, Eigenvector Centrality</td>
<td>No (supported in the opposite direction)</td>
<td>12</td>
</tr>
<tr>
<td>8: The greater an individual’s centrality within the friendship network, the less perceived stress experienced by the individual.</td>
<td>DV: Stress IV: Eigenvector Centrality CV: Tenure, Gender, Primary Language, Ethnicity, Interdependent SC, Independent SC</td>
<td>No</td>
<td>17</td>
</tr>
<tr>
<td>9a: The higher an individual’s independent self-construal, the greater the number of publications.</td>
<td>DV: Publications IV: Independent Self-Construal CV: Tenure, Gender, Primary Language, Ethnicity</td>
<td>No</td>
<td>14</td>
</tr>
<tr>
<td>9b: The higher an individual’s degree centrality within the friendship network, the greater the number of presentations.</td>
<td>DV: Presentations</td>
<td>No</td>
<td>14</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>Regression Equation</td>
<td>Supported</td>
<td>Table</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-----------</td>
<td>-------</td>
</tr>
<tr>
<td>independent self-construal, the greater the number of presentations.</td>
<td>IV: Independent Self-Construal CV: Tenure, Gender, Primary Language, Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10a: The higher an individual’s interdependent self-construal, the more</td>
<td>DV: Stress IV: Interdependent SC CV: Tenure, Gender, Primary Language, Ethnicity,</td>
<td>Yes</td>
<td>10</td>
</tr>
<tr>
<td>likely the individual is to experience stress.</td>
<td>Eigenvector Centrality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10b: The higher an individual’s independent self-construal, the less</td>
<td>DV: Stress IV: Independent SC CV: Tenure, Gender, Primary Language, Ethnicity,</td>
<td>No</td>
<td>10</td>
</tr>
<tr>
<td>likely the individual is to experience stress.</td>
<td>Eigenvector Centrality</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX A: INTERPERSONAL NETWORK QUESTIONNAIRE
Principal Investigators:

Dr. Ajay Mehra  
(Assistant Professor)

Ana Sierra Leonard  
(Doctoral Candidate)

Dr. Ralph Katerberg  
(Associate Professor)

Interpersonal Network Questionnaire

Department of Management  
College of Business  
University of Cincinnati  
Cincinnati, Ohio 45242

Email: Ajay.Mehra@uc.edu  
Office Phone: 513.556.7129  
Home Phone: 513.751.4960

The PhD Project
This section of the questionnaire requests that you identify people at The PhD Project with whom you have specific kinds of relationships. This includes both people in the Management Doctoral Students Association (MDSA) and affiliates of The PhD Project, such as corporate sponsors, administrative staff and members of the academic community. An alphabetized list of names is provided as an aid to recall. The list is grouped by the academic institution with which the person is affiliated. The PhD Project corporate affiliates are sorted alphabetically at the end of the list.

Before beginning, please carefully read the short descriptions below that explain what we mean by each of the relations about which we request information. We recognize that some of these questions may sound somewhat unusual at first, so please read them closely before moving on to the next page. The individual responses you provide will be treated as strictly confidential.

**Friendship:** People you consider your personal friends. Friends are people with whom you like to spend your free time during conferences, people with whom you feel an emotional attachment, people with whom you keep in touch during the year.

**Mentor:** People who have taken a personal interest in your professional or career development. Frequently, these people help you develop your own career by sharing the benefits of their experience. For example, these individuals may have helped you with the job search process or provided feedback on your research and/or teaching.

**Protégé:** People whom you mentor. Individuals in whose careers you have taken a personal interest. You have helped these people’s careers by sharing with them the benefits of your experience.

**Role-Model:** People you would most like to be like, individuals you model yourself after.

**Similarity:** People you consider to be especially similar to yourself. Because it is your perceptions that are most important to us, the basis for judging similarity is entirely up to you.

**Dissimilarity:** People you consider to be especially dissimilar to yourself. Because we are interested in your perceptions, the basis for judging dissimilarity is entirely up to you.
For each relationship question, check off as many or as few boxes as you think appropriate. For example, the first relationship we ask you to consider is friendship. Please think of all the people within The PhD Project you consider to be personal friends. Then, using the alphabetized list of names as an aid to recall, place a check mark next to their names. When you are finished, repeat the procedure for the next relationship. Please refer back to the detailed explanations of each of the relations when necessary. If you would like to add any names that you think are relevant but missing from the list, please use the blank spaces at the end.

<table>
<thead>
<tr>
<th>Additional Names</th>
<th>Is Your Personal Friend</th>
<th>Is Your Mentor</th>
<th>Is Your Protégé</th>
<th>Is Your Role-Model</th>
<th>Is Someone Especially Similar to Yourself</th>
<th>Is Someone Especially Dissimilar to Yourself</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Please add any names that are relevant but not listed above in the blank spaces below.
Having learned something about the nature of your relationships with others, we would now like to ask you to reflect on how valuable you find some of these relationships. This section asks you to consider how valuable your friendship, role-model and mentoring networks are in your career. By networks we simply mean the set of people whom you listed above with regard to your friendship, role-model, and mentoring relations.

Please rate how valuable you find each of the following networks of relationships by circling, for each network, the numbered response that seems most appropriate to you.

<table>
<thead>
<tr>
<th>Friendship Network: (this network is made up of all the people who you identified as “personal friends”)</th>
<th>Mentor Network (this network is made up of all the people who you identified as “mentors”)</th>
<th>Role-Model Network (this network is made up of all the people who you identified as “role-models”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Valuable at All</td>
<td>Extremely Valuable</td>
<td>Not Valuable at All</td>
</tr>
</tbody>
</table>

a. How valuable have each of these networks been to your career thus far?

b. How valuable do you think each of these networks will be to your future career success?

Section 2

In this section, we’d like to learn a little more about you as an individual.

The four questions below ask about your feelings and thoughts since you started your doctoral program. In each case, you will be asked to indicate how often you felt or thought a certain way. Please indicate the degree to which each of the following statements best describes your beliefs by circling, for each statement, the numbered response that seems most appropriate to you.

2A. Since joining your doctoral program…

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Almost never</th>
<th>Sometimes</th>
<th>Fairly often</th>
<th>Very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often have you felt that you were unable to control the important things in your life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. How often have you felt confident about your ability to handle your personal problems?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. How often have you felt that things were going your way?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. How often have you felt difficulties were piling up so high that you could not overcome them?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
## 2B.
The following statements describe personal characteristics. No two statements are exactly alike, so please consider each statement carefully before answering. Please indicate the degree to which each of the following statements describe you best by circling, for each statement, the numbered response that seems most appropriate to you.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have respect for authority figures with whom I interact.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2. It is important for me to maintain harmony within my group.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3. My happiness depends on the happiness of those around me.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>4. I would offer my seat in a bus to my professor.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>5. I respect people who are modest about themselves.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>6. I will sacrifice my self-interest for the benefit of the group I am in.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>7. I often have the feeling that my relationships with others are more important than my own accomplishments.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>8. I should take into consideration my families’ advice when making education / career plans.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>9. It is important to me to respect decisions made by the group.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>10. I will stay in a group if they need me, even when I’m not happy with the group.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>11. If someone in my group fails, I feel responsible.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>12. Even when I strongly disagree with group members, I avoid an argument.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>13. I’d rather say “No” directly, than risk being misunderstood.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>14. Speaking up during a class is not a problem for me.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>15. Having a lively imagination is important to me.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>16. I am comfortable with being singled out for praise or rewards.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>17. I am the same person at home that I am at school.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>18. Being able to take care of myself is a primary concern for me.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>19. I act the same way no matter who I am with.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>20. I feel comfortable using someone’s first name soon after I meet them, even when they are much older than I am.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>21. I prefer to be direct and forthright when dealing with people I’ve just met.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>22. I enjoy being unique and different from others in many respects.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>23. My personal identity, independent of others, is very important to me.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>24. I value being in good health above everything.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
2C. The statements below concern your personal reactions to a number of different situations. No two statements are exactly alike, so please consider each statement carefully before answering. If a statement is TRUE or MOSTLY TRUE as applied to you, circle “T”. If a statement is FALSE or NOT USUALLY TRUE as applied to you, please circle “F”.

We recognize that some of these questions may be difficult to answer but it is important that you answer each one, and that you answer as frankly and honestly as you can. Your responses will be kept strictly confidential.

<table>
<thead>
<tr>
<th>Statement</th>
<th>T</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I find it hard to imitate the behavior of other people.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. At parties and social gatherings, I do not attempt to do or say things that others will like.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I can only argue for ideas which I already believe.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I can make impromptu speeches even on topics about which I have almost no information.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I guess I put on a show to impress others.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I would probably make a good actor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. In a group of people, I am rarely the center of attention.</td>
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<tr>
<td>8. In different situations and with different people, I often act like very different persons.</td>
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<tr>
<td>9. I am not particularly good at making people like me.</td>
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<tr>
<td>10. I’m not always the person I appear to be.</td>
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<tr>
<td>11. I would not change my opinions (or the way I do things) in order to please someone or win their favor.</td>
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<tr>
<td>12. I have considered being an entertainer.</td>
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<tr>
<td>13. I have never been good at games like Charades or improvisational acting.</td>
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<tr>
<td>14. I have trouble changing my behavior to suit different people and different situations.</td>
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<tr>
<td>15. At a party I let others keep the jokes and stories going.</td>
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<tr>
<td>16. I feel a bit awkward in public and do not show up quite as well as I should.</td>
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<tr>
<td>17. I can look anyone in the eye and tell a lie with a straight face (if for a right end).</td>
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<tr>
<td>18. I may deceive people by being friendly when I really dislike them.</td>
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</tbody>
</table>

2D. The following set of questions asks about your opinions. Please indicate the degree to which each of the following statements best describes your beliefs by circling, for each statement, the numbered response that seems most appropriate to you.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Only those who depend on themselves get ahead in life.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2. In the long run the only person you can count on is yourself.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3. I would rather struggle through a personal problem by myself than discuss it with my friends.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>4. A person should accept the group’s decision even when personally he or she has a different opinion.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>5. The needs of people close to me should take priority over my personal needs.</td>
<td>1 2 3 4 5</td>
<td></td>
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</tbody>
</table>
Finally, we would like to ask a few questions about you that will help us insure the validity of the results.

1. What is your gender? (please circle): Female / Male
2. Are you married? (please circle): Yes / No
3. Are you a parent? (please circle): Yes / No
4. What is your present age? _____________________ years.
5. Which of the following best describes you (check as many as apply to you)?

____________ Asian / Pacific-Islanders / Asian-American
____________ Black / African / African-American
____________ Latino / Hispanic-American
__________ Central American
__________ Cuban
__________ Mexican
__________ Puerto Rican
__________ South American
__________ Other: please describe: ______________________
____________ Native American / Alaskan Native
____________ White / Caucasian-American
__________ Other: please describe________________
6. Were you born in the United States? (please circle) Yes / No
   If not, how many years have you lived in the United States? _________________
7. What do you consider to be your primary language? ______________________
8. If you attended a November PhD Project Conference, what year was it? ______________
   If you did not attend a November conference, what was the first year you attended an August PhD Project pre-conference? ______________
9. What year did you enter your doctoral program? _________________
10. Within your doctoral program, what is your area of concentration, e.g., OB, OT, Strategy?
11. This question asks about your progress in the doctoral program. If you have already completed a stage, fill in the date you completed it, otherwise, fill in the date you anticipate completing it.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Anticipated MM/YY</th>
<th>Actual MM/YY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Work Completion</td>
<td></td>
<td></td>
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<tr>
<td>Qualifying Exams</td>
<td></td>
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<tr>
<td>Comprehensive Exams</td>
<td></td>
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<tr>
<td>Dissertation Proposal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissertation Defense</td>
<td></td>
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</tbody>
</table>

12. Please list any publications or any conference presentations you have delivered since joining your doctoral program.

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

13. If you have already received your Ph.D., are you currently (circle as many as apply):

   a) Employed in an academic position?
   b) Employed in a non-academic position?
   c) Seeking employment in an academic position?
   d) Seeking employment in a non-academic position?
Is there anything else about your participation in The PhD Project Management Doctoral Students Association (MDSA) or the kinds of relationships you have (or have not) developed within MDSA that you would like to share with us? If so, please use this space for that purpose.

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Please make sure that you have completed all of the questions and then use the enclosed envelope to return your questionnaire to us. Remember, for purposes of anonymity, do not put your name on the questionnaire.

Thank you very much for taking the time to complete the questionnaire. Your responses are indispensable to the success of The PhD Project.
APPENDIX B: LETTERS SENT TO SURVEY SAMPLE

(see attached)
INTERPERSONAL NETWORKS AND CAREER SUCCESS

The PhD Project is a success story. One reason for this success, we believe, is that The PhD Project allows each of you to develop and maintain interpersonal relationships with members of the Management Doctoral Student Association, and with other affiliates of The PhD Project. These relationships are important because they provide access to resources, such as advice and mentorship, that are critical to your career success.

We are writing to request your participation in an important study that is designed to help us learn more about the antecedents and career consequences of these interpersonal relationships. Our overarching goals are to 1) learn about the emergent structure of these relationships, and 2) find ways of facilitating networking opportunities to enhance your career success. Upon completion of the study, we will share with all participants our overall findings detailing the links between types of interpersonal networks and career success. We will also provide interested individuals with personalized maps that will show their precise location in the overall network of relationships.

We wish to stress at the outset that your individual responses will be treated as strictly confidential. Once we receive your completed questionnaire in the mail, we will use a random number (you can find this on the last page of your questionnaire) to enter your responses onto a computer. Only Dr. Mehra will know which numbers correspond to which names, and he will not share this information with anybody, not even with the other members of the research team. When presenting the results of the study, we will provide only overall results, thus protecting the identities of individual respondents.

The pretests we have conducted suggest that the questionnaire should take approximately a half-hour to complete. There are no right or wrong answers—the questions ask for your personal opinions. Your participation is voluntary. However, the usefulness of the results will be greatly diminished with each unanswered questionnaire. Therefore, we do hope that you will take the time to respond.
We would like to receive all the completed questionnaires by May 5, 2000 so we can begin data entry and analysis. The sooner we receive your responses the sooner we will be able to share the findings of the study with you. As an added incentive, we will enter everyone who responds into a lottery. Four winners will receive $50 each as a token of our appreciation.

Please use the enclosed pre-addressed, stamped envelope to return your completed questionnaire.

We will be happy to answer any questions you may have. Please feel free to contact us at any time.

Thanks for your participation.

Sincerely,

Ajay Mehra
Assistant Professor of Management
Office: 513.556.7129
Home: 513.751.4960
E-mail: Ajay.Mehra@uc.edu

Dr. Ralph Katerberg, Associate Dean
Associate Professor
Office: 513.556.7003
E-mail: Ralph.Katerberg@uc.edu

Ana Sierra Leonard
Doctoral Candidate
Office: 513.556.7133
E-mail: Ana.S.Leonard@uc.edu
It is difficult to overstate the importance of relationships for career success and satisfaction. We rely on our ties with others for support, advice, and sponsorship. One of our overarching goals here at the PhD Project is to promote the development of a web of ties between minority doctoral students, and key affiliates in academia and corporate America. Indeed, we believe this informal network of ties may be one of the most important benefits of the PhD Project.

I am writing to request your participation in an important study designed to help us better see the existing web of relationships between members of the Management Doctoral Student Association and affiliates of the PhD Project. The data from this study will help us better understand both the antecedents and consequences of informal networks within the PhD Project. Overall results will be shared with all participants at the next session of the Management Doctoral Student Association at the upcoming Academy of Management meetings in Toronto.

Let me underscore two points. First, your individual responses will be completely confidential. Only overall findings will be shared at the meetings. Second, a high response rate is especially critical when studying networks, so please do take the time to respond to the survey.

Thanks for helping us to make the PhD Project a success.

Very truly yours,

Bernard J. Milano
Executive Director, KPMG Foundation
PhD Project Coordinator
APPENDIX C: FOLLOW-UP LETTERS SENT TO SURVEY SAMPLE

(see attached)
May 12, 2000

I hope you've received the *Interpersonal Network Questionnaire*, which was mailed to you last week. If you have already completed and returned the questionnaire, please accept my sincere thanks. If not, please try to do so today. A high response rate is especially critical when studying networks, so I do hope you will take the time to respond.

If, by some chance, you did not receive the questionnaire, or if it has been misplaced, please give Ana Leonard a call at (513) 984-8851 or email me at Ajay.Mehra@uc.edu and I will get another one in the mail to you today.

Sincerely,

Dr. Ajay Mehra
June 5, 2000

Dear PhD Project Participants

A few weeks ago, I sent you a questionnaire as part of ongoing research (being conducted under the auspices of KPMG Peat Marwick and The PhD Project) that is designed to help us learn more about the antecedents and career consequences of emergent interpersonal relationships among members of The PhD Project’s Management: Doctoral Student Association.

These relationships are important because they provide access to resources, such as advice and mentorship, which are critical to your career success. The goal of this research is to (1) learn about the emergent structures of these relationships, and (2) find ways of facilitating networking opportunities to enhance your career success. In studies of this kind even a few instances of non-response cast significant doubt on the accuracy of the results. Thus, I am especially keen to receive your response.

I recognize that you have a busy schedule, and that you may have misplaced the questionnaire. I am enclosing another copy of the questionnaire, along with a pre-stamped envelope you can use for returning the completed questionnaire. It should take only a half-hour or less to complete. Please do not hesitate to contact me should you have any questions. Thank you very much for your cooperation.

Sincerely yours,

[Signature]

Ajay Mehra

Work: 513.556.7129
Home: 513.751.4960
Internet: Ajay.Mehra@uc.edu
APPENDIX D: SELF-CONSTRUAL SCALE

Interdependent items

1. I have respect for authority figures with whom I interact.
2. It is important for me to maintain harmony within my group.
3. My happiness depends on the happiness of those around me.
4. I would offer my seat in a bus to my professor.
5. I respect people who are modest about themselves.
6. I will sacrifice my self-interest for the benefit of the group I am in.
7. I often have the feeling that my relationships with others are more important than my own accomplishments.
8. I should take into consideration my parents’ advice when making education / career plans.
9. It is important to me to respect decision made by the group.
10. I will stay in a group if they need me, even when I’m not happy with the group.
11. If someone in my group fails, I feel responsible.
12. Even when I strongly disagree with group members, I avoid an argument.

Independent items

13. I’d rather say “No” directly, than risk being misunderstood.
14. Speaking up during a class is not a problem for me.
15. Having a lively imagination is important for me.
16. I am comfortable with being singled out for praise or rewards.
17. I am the same person at home that I am at school.
18. Being able to take care of myself is a primary concern for me.
19. I act the same way no matter who I am with.
20. I feel comfortable using someone’s first name soon after I meet them, even when they are much older than I am.
21. I prefer to be direct and forthcoming when dealing with people I’ve just met.
22. I enjoy being unique and different from others in many respects.
23. My personal identity independent of others is very important to me.
24. I value being in good health above everything.
APPENDIX E: PERCEIVED STRESS SCALE

Since joining your doctoral program…

1. How often have you felt that you were unable to control the important things in your life?

2. How often have you felt confident about your ability to handle your personal problems? (Reverse scored)

3. How often have you felt that things were going your way? (Reverse scored)

4. How often have you felt difficulties were piling up so high that you could not overcome them?
APPENDIX F: LETTER OF APPROVAL FROM HUMAN SUBJECTS COMMITTEE

(see attached)
December 15, 2000

Ana S. Leonard
Management
ML #0165

Dear Ms. Leonard:

The West Campus Human Subjects Committee (WCHSC) wants to acknowledge your forthright and responsible approach in resolving the lack of human subjects approval to conduct your research in your letter of December 4, 2000 and in the meeting with the Committee, December 7, 2000.

The Committee recognizes that you have accepted the responsibility for proceeding with the pilot without WCHSC approval and have taken corrective steps in seeking approval to continue with the research, "An Exploration of the Role of Self-Construal in the Development of Emergent Networks: The Experience of a Diverse Organization."

This research is classified as Exempt. The Committee grants you approval to use the pilot data for the completion of your study. You have taken steps to protect confidentiality within your procedures. You do need to realize that subjects can request to know who won the $50 incentive lottery and so there is a breach in confidentiality of who participated. The disclosure of winners' names should be addressed in the letter to subjects. Please submit the revised consent for the records.

The principal investigator must report to the Chair of the Human Subjects Committee any changes affecting the protocol upon which this certification is based. No such changes, except those necessary to eliminate immediate hazards, should be made without prior approval by the committee.

Sincerely,

[Signature]
Margaret Miller, Ed.D., RN
Chair, West Campus Human Subjects Committee

cc: Dr. Ralph Katerberg