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The purpose of the Journal of Managerial Issues is to contribute to the advancement of knowledge directly related to the theory of organizations and the practice of management. Its primary goal is to disseminate the results of new and original scholarly activity to a broad audience consisting of university faculty and administrators, business executives, consultants, and government managers. The Journal also acts as a bridge between the academic and business communities.

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Practicing What We Teach: Applying Organizational Behavior Theory to Academic Success

Bonnie F. Daily, James W. Bishop, and Stephanie Maynard-Patrick

Institutions of higher learning are concerned with student performance, retention, and graduation rates. The authors believe an important stream within business scholarship, Organizational Behavior (OB), may provide vital insights regarding factors impacting student success. This paper aims to “practice what we teach,” by using OB constructs to study performance, not in the workplace with employees, but in a business school setting with students. 156 undergraduate business students were surveyed on modified OB support theory constructs including faculty, parental, and peer support in relation to their professional commitment to the field of business and organizational commitment to their institution. In addition, the authors tested the relationship of felt responsibility acting as a mediating variable from the chosen foci of commitment to academic performance. The findings suggest relevant organizational support antecedents to professional commitment and organizational commitment in the academic setting.

Social Networks and Corporate Performance: The Moderating Role of Technical Uncertainty

Sui-Hua Yu and Wei-Ting Chiu

This study examines the relationship between social networks and corporate financial performance and the moderating effect of technical uncertainty using business network data collected from 353 high-tech companies in Taiwan. The authors particularly focus on investigating network centrality, which determines a firm’s ability to mobilize resources and information through social networks. Empirical results show that the relationship between social networks and corporate performance is an inverted U-shaped curve. When network centrality begins to increase, corporate performance as measured by sales growth increases until it reaches equilibrium after which it begins to decrease with the increase of network centrality. This shows that overly high network centrality has a negative impact on corporate performance, while moderate network centrality can lead to the greatest performance in a company. Moreover, increasing the level of technical uncertainty increases the positive effect of social networks on corporate performance and the amplitude of the effects of social networks. Therefore, the higher the level of technical uncertainty companies face, the more companies rely on social networks to promote business development.
Achievement Goals in Organizations: Is There Support for Mastery Avoidance? ....................................................................................... 46
Lisa E. Baranik, Abigail R. Lau, Laura J. Stanley, Kenneth E. Barron, and Charles E. Lance

This validity study strengthens evidence for the Achievement Goals at Work (AGW) scale scores by demonstrating the invariance of the scores across college-aged and older employees and showing the association of AGW scores with important job-related variables. The tests of measurement invariance support the configural, metric, and scalar invariance of scores across these two worker populations. Given the measurement invariance of the scores, the authors test predictions made by the lifespan theory of control and find that college-aged employees score higher on all goal scales than older workers with the exception of mastery-approach. With a second sample of experienced, full-time workers from a large manufacturing company the authors find that mastery-avoidance is positively correlated with feedback-seeking and motive to avoid failure. As a whole, the results from the study affirm that the four-factor AGW scale is a viable measure of achievement goals in the workplace.

Social Capital as a Conduit for Alliance Portfolio Diversity ........................................... 62
Jamie D. Collins

Alliance portfolio diversity is a construct that is increasingly receiving attention in the literature as it has been linked to a firm’s performance and innovation. Although recent studies have focused on analyzing how portfolio diversity affects performance, there is a need to address the factors that influence portfolio diversity as well. The purpose of this study was to test whether the number and strength of social capital connections play a role into the alliance portfolio diversity of a firm. To do so, two different levels of antecedents, top management team level and firm level, were examined. A sample of 300 randomly selected Standard & Poor’s firms were analyzed by time-series regression. The results suggest that at both the firm- and top management team level, the number and strength of social capital connections held is positively related to the firm’s alliance portfolio diversity. Implications for managers and researchers are discussed.
Exploratory Study

Gender, Conflict, and Workplace Bullying: Is Civility Policy the Silver Bullet? ................................................................................................ 79
Jacqueline A. Gilbert, Deana M. Raffo, and Toto Sutarso

This research examined whether a culture of civility affected how employees were viewed within workplace conflict scenarios. The purpose was to investigate perceptions of female and male targets that defended themselves when verbally attacked, and whether the existence of an anti-bullying or “civility” policy made a positive difference. In a laboratory experiment exploring the impact of policy on work-related variables, 238 undergraduate business students answered questions after viewing a candidate vita and employment performance profile. In a departure from previous studies, the results implied that analyses conducted with paper and pencil surveys may not be as appropriate for a generation that responds to a visual style of learning (MacQuarrie, 2011). In a follow-up qualitative analysis conducted via mail, participants completed a survey to examine perceptions of workplace bullying from a more in-depth perspective. The preliminary results indicated that office incivility is considered a serious problem, and should be studied in a manner that is best able to capture its potential impact. The study concluded that psychological work abuse is indeed a complex phenomenon that can impact a variety of organizational stakeholders.
Practicing What We Teach: Applying Organizational Behavior Theory to Academic Success

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Institutions of higher learning are particularly concerned about student performance. Lack of academic success eventually leads to poor student retention and graduation rates. Failure to achieve acceptable levels in these measures can result in a number of deleterious outcomes including, but not limited to, loss of reputation among peer institutions, prospective students, and public policymakers; negative effects on funding from a variety of sources including state governments, private donors, and the Federal Government; and unfavorable rankings from accreditation bodies and other rating entities (Lau, 2003; Astin, 1993).

Over the years, educational researchers have examined numerous theories and tested various empirical relationships regarding the academic environment (Nichols, 2010; Strauss and Volkwein, 2004; Astin, 1993). Much of this research has provided important information regarding student academic performance. However, the authors believe an important stream of research within business scholarship, Organizational Behavior (OB), might also provide vital insights regarding factors impacting student success.
Organizational Behavior theory is a significant foundation for many business school teachings. It covers a number of sundry topics such as leadership, motivation, support, and commitment, among others (Miner, 2003). In addition, many OB factors have been empirically tested as predictors of outcomes such as organizational performance in the workplace (Siders et al., 2001; Meyer et al., 1989).

There have been some studies on the application of OB constructs in the academic environment including topics such as: satisfaction, expectancy, and theory of planned behavior (Ajzen and Madden, 1986; Bean and Bradley, 1986; Geiger and Cooper, 1995). However, this is but a beginning, more examination of OB theories needs to be done in relation to student success. Certainly, an argument could be made that OB workplace issues such as support and commitment could also be key factors for success in school. Hence, this paper aims to “practice what we teach” by using OB constructs to study performance, not of employees in the workplace, but of students in a business school.

One area of OB research that may have strong implications for the academic environment is Organizational Support Theory (OST). OST examines how perceptions of workplace support impact an employee’s beliefs and behaviors (Rhoades and Eisenberger, 2002). Essentially, the theory espouses that if employees feel that the organization cares about their well-being and values their contributions then the employees will reciprocate in some way that is of benefit to the organization.

Similarly, issues related to support have also been examined in educational research. Rosas and Hamrick (2002) conducted a qualitative study wherein students were asked questions regarding their parental and community support in regards to the students’ academic efforts. The study concluded that students that felt supported responded with a desire to do well in school.

In addition, other educational research studies have reported similar findings. Panos and Astin (1967) examined various social support systems in college including peer and faculty relationships and reported that support from these sources were related to student persistence academically. Furthermore, parental support and family support were also found to be positively related to students’ psychological well-being (Cohen and Wills, 1985) and GPA (Cutrona et al., 1994; Supple and Small, 2006). Moreover, lack of peer support was found to predict lower student GPA (Dennis et al., 2005). Finally, Strauss and Volkwein (2004) determined that peer relationships and campus activities are strong predictors of a construct called institutional commitment. That is, if a student feels strongly supported by peers and is highly involved in activities at school they are more committed to staying at that institution.

This is very similar to the idea of organizational commitment in the workplace. In particular, OST research has shown that employees who perceive support from their organizations feel higher levels of affective commitment toward their organizations (Eisenberger et al., 1986; Rhoades and Eisenberger, 2002). In addition, increased levels of employee affective commitment have been found to be positively related to higher levels of performance, reduced absenteeism, and lower intention to quit (Bishop et al., 2000; Mathieu and Zajac, 1990; Meyer and Allen, 1997; Mowday et al., 1982).

This paper proposes that a comparable relationship exists between support for students and commitment and academic performance, and support for employees and
commitment and job performance. Although, this study does not propose a direct relationship from commitment to academic performance but one that is mediated by felt responsibility. Specifically, felt responsibility is defined in the OB literature as the degree to which individuals feel personally accountable and responsible for the results of their work (Hackman and Oldham, 1976). Students could feel committed to their institutions due to factors such as location or a star sports team. However, this paper proposes that felt responsibility is the mechanism through which commitment affects performance. If a student accepts the goals and values of an institution (commitment) and then manifests a level of work responsibility, it is more likely their academic performance will be higher than if they did not feel responsible.

Correspondingly, this paper examines another focus of commitment, professional commitment, in the academic setting. Professional commitment (PC) can be conceptualized as being similar to organizational commitment (McElroy et al., 1993; Wallace, 1995; Saks, 1996). However, it is the relative strength of one’s identification with and involvement in a profession as opposed to the organization. Professional commitment has been found to be positively related to job performance in the workplace (Jauch et al., 1978; McElroy et al., 1993). Yet, professional commitment as viewed in the academic environment has neither been studied in the educational or OB research.

Students in an academic setting choose a major, be it business, engineering, or another field. Indirectly, students when choosing a major are choosing a professional field from which to practice in the future. Certainly, faculty and the course work they provide can be seen as representations of the profession. How favorably or unfavorably a student views this information may impact their persistence in a chosen major and ultimately a chosen profession. This paper proposes that a student’s level of identification with their chosen profession may have an impact, similar to organizational commitment, indirectly on academic performance as mediated by felt responsibility.

Nonetheless, to date, a comprehensive support-commitment model including parental, faculty, and peer support for students has not been published in either the OST or educational research. This paper proposes and tests such a model (Figure 1).

It should be noted that the theoretical linkages proposed in this paper are also different from traditional OST in the workplace. In the workplace, again, organizational support has been positively related to commitment and commitment positively related to job performance (Eisenberger et al., 2001). In essence, the support-commitment relationship allows organizations to reap direct reciprocations from supporting their employees. However, in the academic setting students rarely deliver direct benefits back to their providers of support. Instead, students generally are the primary beneficiaries of doing well in school.

Overall, this study extends educational research and expands research in OST/OB in multiple ways: (1) the paper proposes a comprehensive commitment-support model in the academic environment; (2) felt responsibility is examined as mediator of commitment to performance in the academic environment; and (3) a new perspective on the commitment-support relationship is examined in the academic environment which is different from the workplace environment.
CONSTRUCTS

Support

This paper provides three variables of support: faculty, parental, and peer. As stated in the introduction, educational research has demonstrated that these constructs are antecedents to academic persistence (Panos and Astin, 1967). Furthermore, peer and parental support have shown impacts on students’ well-being (Rosas and Hamrick, 2002; Dennis et al., 2005). Finally, Strauss and Volkwein (2004) found peer support was positively related to institutional commitment. This study builds on and expands upon these educational research findings by modifying OST constructs developed by Eisenberger et al. (1986) to define faculty and parental support in the proposed model. In addition, peer support was also adapted from the OST literature from Bishop et al. (2000). The following provides a description of the modified constructs.

Perceived Faculty Support (PFS)

Perceived faculty support is the extent to which students believe that faculty value their academic contribution and care about their well-being. PFS is modified from the construct Perceived Organizational Support (POS). POS is the degree to which the employees perceive that the organization values their contribution and cares about their well-being (Eisenberger et al., 1986). Kottke and Sharafinski (1988) were the first to demonstrate the utility of POS by applying it to other sources of support. In their case, supervisors served as the source of support. The authors expand on this by introducing faculty as an analogy for supervisors. Clearly, faculty members are professionals in the field of business who can provide information about and experiences related to the profession. It is also through the provision of advice during class or in one-on-one interaction that students may feel that faculty care about their well-being and develop a commitment to the university (organization).

Perceived Parental Support (PPS)

Perceived parental support is the degree to which students believe that their parents value their academic contribution and care about their well-being. This definition is also a modification of POS. At this point, the parallels to organization proxies become a bit more tenuous. However, the authors suggest that many undergraduate students still depend upon their parents for support for their academic progress. One theme that emerged from Rosas and Hamrick’s (2002) interviews with college students was that students who did not feel their parents understood the effort required to do well academically, or the importance of doing well, felt saddened and frustrated. Therefore, it appears that students want their parents to value their academic journey.
Perceived Student Support (PSS)

Perceived peer support is the degree to which students believe that their fellow students value their academic contribution and care about their well-being. This construct is adapted from prior OST research on perceived team support (Bishop et al., 2000). Similar to the workplace it is likely that students will begin to form relationships with those individuals that they interact with regularly. Students are in the same boat and are like employees in a common workplace; they face the same academic pressures, in the same environment, and are likely to have analogous goals and objectives. Students may cultivate functional (course work related) or supportive (i.e., friendship) relationships that can provide varying degrees of support.

Commitment

This paper provides two foci of commitment: organizational commitment and professional commitment.

Organizational Commitment (OC). Organizational commitment (OC) is defined in the OB literature as the relative strength of an individual’s identification with and involvement in a particular organization and is characterized by at least three factors: (1) a strong belief in and acceptance of the organization’s goals and values; (2) a willingness to exert considerable effort on behalf of the organization; and (3) a strong desire to maintain organization membership (Mowday et al., 1982). This is similar to the construct proposed by Strauss and Volkwein (2004) in the educational literature called institutional commitment.

Professional Commitment (PC). Professional commitment (PC) can be conceptualized as being similar to organizational commitment (McElroy et al., 1993; Wallace, 1995; Saks, 1996). Although, it is the relative strength of one’s identification with and involvement in a profession as opposed to the organization. Professional commitment is characterized by: (1) a strong belief in and acceptance of professional goals and values; (2) a willingness to exert considerable effort to practice the profession; and (3) a strong desire to remain a member of it. It is based upon investments (e.g., time, finances, opportunity costs) required to become a member of the profession, involvement with other members of the profession, and interest in the skills required to practice it (Becker and Carper, 1956a; 1956b).

Students through interactions with faculty and other students become familiar with their future professional fields. They may learn about their chosen professions in their classrooms with guest speakers and through student professional organizations. Furthermore, group projects and associated professional activities in student organizations may also provide insights regarding future coworkers within a profession. Clearly, students have some view of their chosen future vocation while in school and as such develop a level of identification and sense of belonging with that profession. Hence, the authors expect that professional commitment is a construct that exists in the academic environment.
Felt Responsibility (FR)

Felt responsibility is defined in the OB literature as the degree to which individuals feel personally accountable and responsible for the results of their work (Hackman and Oldham, 1976). Much of the extant work on felt responsibility has been done in the context of the job characteristics model (Hackman and Oldham, 1976), which proposes that experienced or felt responsibility mediates relationships between various job characteristics and several desirable outcomes including job performance. The mediating role of felt responsibility is premised on the idea that it is the mechanism through which accepting goals and values and being willing to put forth effort (i.e., commitment) are translated into specific and purposeful role related behavior (i.e., job or academic performance). This paper suggests that the mechanism of felt responsibility in the workplace would behave in a very similar manner in the academic environment since academic achievements can be akin to workplace accomplishments.

Academic Performance (AP)

Academic performance is defined and measured as the student’s Grade Point Average (GPA).

HYPOTHESIS DEVELOPMENT

Perceived Faculty Support, comparable to Perceived Supervisory Support from the OST literature, should provide students with feelings of care from their institution. In the workplace this often results in higher organizational commitment. Additionally, educational research has also found faculty support is important to academic persistence. Hence, PFS would be expected to have a relationship with the students’ organizational commitment (as defined in OST) to their institutions. This study proposes that:

\[ H1a: \text{Perceived Faculty Support is positively related to Organizational Commitment.} \]

Similarly, perceived faculty support may also be related to professional commitment. Since faculty represent the profession and often provide information regarding the profession, it is likely they will influence the student’s level of identification with the profession. The more supportive a faculty member is the more it is likely that a student will attribute a positive association with the profession. Hence, this study proposes that:

\[ H1b: \text{Perceived Faculty Support is positively related to Professional Commitment.} \]

Parents have an enormous influence on their children. The parents’ beliefs about the academic institution a child has chosen to attend will most likely be communicated
to the child. In addition, the financial and emotional support provided for the child's higher education will most likely correspond to those beliefs about the chosen institution. Therefore, it is theorized that Perceived Parental Support will be related to a students’ sense of belonging and identification with their school. Hence, this study proposes that:

\[ H2a: \text{Perceived Parental Support is positively related to Organizational Commitment.} \]

It is also probable that parents will communicate positive or negative beliefs about the student’s chosen major and ultimately chosen professional field to the student. Again, these beliefs will most likely have an impact on the parents’ level of support for the student. Parents may also serve as role models or champions for a profession by encouraging their children to succeed in a certain discipline despite challenges. Therefore, it is theorized that perceived parental support will be related to a student’s sense of belonging and identification with their profession. Hence, this study proposes that:

\[ H2b: \text{Perceived Parental Support is positively related to Professional Commitment.} \]

Peer relationships also play a pivotal role in the academic environment. Students often develop relationships with members of their academic cohort (i.e., class of 2014) through courses and activities at college. Similarly, in the workplace employees develop relationships with their coworkers. In particular, Bishop et al. (2002) found perceived team support was positively related to team commitment. Additionally, in the education literature, Strauss and Volkwein (2004) determined that peer relationships were strong predictors of institutional commitment. Hence, peers may create experiences that are related to the student’s identification with or desire to be a part of the university. Thus, this study proposes that:

\[ H3a: \text{Perceived Student Support is positively related to Organizational Commitment.} \]

Peers may also be involved in providing information on the profession or cultivating a desire to be a member of a profession. Akin to parents, peers will provide negative or positive beliefs about the chosen professional field. They will also provide information based on their efforts and activities in the classroom that may reflect on future coworker behavior in the profession. It is theorized that Perceived Peer Support will be related to a student’s sense of belonging and identification with their profession. Hence, this study proposes that:

\[ H3b: \text{Perceived Student Support is positively related to Professional Commitment.} \]
The Mediating Role of Felt Responsibility

Much of the extant work on felt responsibility has been done in the context of the job characteristics model (Hackman and Oldham, 1976), which proposes that experienced (or felt) responsibility mediates relationships between various job characteristics and several desirable outcomes including job performance. The mediating role of felt responsibility is premised on the idea that it is the mechanism through which accepting goals and values and being willing to put forth effort (i.e., commitment) are translated into specific and purposeful role related behavior (i.e., academic performance). By definition, those with high commitment to an entity have accepted its goals and values and are willing to exert considerable effort on its behalf.

The goals and values of a university are usually stated in general terms (e.g., promote scholarship, achieve high graduation rates) as are those of a profession (e.g., serve customers well, behave ethically). Because of this generality the committed individual may well be unable to address them as stated. However, the individual may well be able to address specific goals and tasks that would contribute to general goals and values. The individual would then take on the responsibility to achieve the more specific and proximal tasks which fall under their purview. Thus, this paper proposes that:

\[ H4a: \text{Organizational Commitment is positively related to Felt Responsibility.} \]
\[ H4b: \text{Professional Commitment is positively related to Felt Responsibility.} \]

Taking responsibility, on the other hand, includes being accountable for producing specific results as part of one’s own job. That is, if individuals accept the distal and general goals and values of the commitment focus and are willing to exert effort on its behalf, then one would expect that felt responsibility will be positively related to academic performance (AP).

\[ H5: \text{Felt Responsibility is positively related to Academic Performance.} \]

METHOD

Research Site, Participants, and Survey Procedure

This study was conducted at a major university in the southwestern United States. A total of 156 undergraduate business students took part in the survey. The students responded to six seven-point Likert scales to measure the perceived support, commitment, and felt responsibility constructs. Response options ranged from “strongly disagree” to “strongly agree.” Participation in the survey was voluntary but no one declined. The students were allowed time during class to complete the survey. A member of the research team was present to administer the survey and answer questions. Participants were assured that all responses would be held in complete confidence. The mean age of the respondents was 24.7 years old, 43% were female and 57% male. In addition, 49% were Hispanic, 36% White, 4% American Indian, 1.5% Black, and 8% were of other ethnic backgrounds.
<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Perceived faculty support</td>
<td>5.33</td>
<td>1.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Perceived parental support</td>
<td>6.34</td>
<td>1.07</td>
<td>0.28</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Perceived fellow student support</td>
<td>4.69</td>
<td>1.04</td>
<td>0.46</td>
<td>**</td>
<td>0.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Institutional commitment</td>
<td>5.73</td>
<td>1.04</td>
<td>0.73</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>0.39</td>
<td>**</td>
<td>(0.91)</td>
</tr>
<tr>
<td>5 Business profession commitment</td>
<td>5.59</td>
<td>1.01</td>
<td>0.35</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>0.43</td>
<td>0.38</td>
<td>(0.93)</td>
</tr>
<tr>
<td>6 Felt responsibility</td>
<td>6.44</td>
<td>0.89</td>
<td>0.29</td>
<td>**</td>
<td>**</td>
<td>0.19</td>
<td>**</td>
<td>0.35</td>
<td>**</td>
</tr>
<tr>
<td>7 Academic success</td>
<td>3.20</td>
<td>0.56</td>
<td>0.25</td>
<td>**</td>
<td>0.05</td>
<td>0.19</td>
<td>**</td>
<td>0.33</td>
<td>0.08</td>
</tr>
</tbody>
</table>

** p < 0.01
* p < 0.05

Coefficient alphas are on the diagonal.
Measures

Perceived parental support was measured with five items from the perceived organizational support survey and modified to refer to the students’ parents. Perceived faculty and fellow student support were measured with the same five items plus a sixth item which referred to classroom contribution. They were modified to refer to the faculty and fellow students, respectively. The commitment variables were measured with eight items from the organizational commitment questionnaire (OCQ) (Mowday et al., 1979) that were altered to refer to the university and the business profession. Four items were used to measure felt responsibility. Three were from Pearce and Gregersen (1991) and one was developed by the authors, “When there is a problem with my coursework, it is my responsibility to see that it gets taken care of.” This item was included because problem-solving is a key component of academic performance. Academic performance was measured by the students’ grade point averages (GPA) taken from university records. The coefficient alphas for all scales were acceptable, ranging from 0.80 to 0.92. Means, standard deviations, coefficient alphas, and correlations are reported in Table 1.

RESULTS

Prior to testing the hypotheses, a confirmatory factor analysis (CFA) was performed on the 38 items of the seven scales. The measurement model fit the data well, $\chi^2 (645, N = 156) = 1304.91$, root mean square error of approximation (RMSEA) = 0.078, comparative fit index (CFI) = 0.95, non-normed fit index (NNFI) = 0.95, and the standardized root mean square residual (SRMR) = 0.064 (Jackson et al., 2009).

The authors tested five alternative measurement models against the hypothesized model. One was a five-factor model in which all support items reflected a single factor. Another was a six-factor model in which all commitment items reflected a single factor. These models were used to determine whether the survey instrument could distinguish between the support variables and the commitment variables, respectively. The authors then tested three additional models in which faculty and parental support reflected a single factor, faculty and student support reflected a single factor, and parental and student support reflected a single factor. The purpose of these models were to determine if the survey instrument could distinguish between support from two authority sources (faculty and parents), support from school related sources (faculty and fellow students), and support from sources away from the faculty (parents and fellow students). The authors employed the chi-squared different test to determine the preferred model (Bollen, 1989). The results reported in Table 2 supported the hypothesized measurement model as the most reasonable representation of the data.
### Table 2

Comparison of Measurement Models

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$\Delta \chi^2$</th>
<th>RMSEA</th>
<th>CFI</th>
<th>NNFI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesized model</td>
<td>1304.91</td>
<td>645</td>
<td>n/a</td>
<td>0.078</td>
<td>0.95</td>
<td>0.95</td>
<td>0.064</td>
</tr>
<tr>
<td>All support items on one factor</td>
<td>2455.54</td>
<td>656</td>
<td>1150.63**</td>
<td>0.153</td>
<td>0.86</td>
<td>0.85</td>
<td>0.157</td>
</tr>
<tr>
<td>All commitment items on one factor</td>
<td>1994.24</td>
<td>651</td>
<td>689.33**</td>
<td>0.146</td>
<td>0.90</td>
<td>0.89</td>
<td>0.105</td>
</tr>
<tr>
<td>Faculty and parental support on one factor</td>
<td>1880.07</td>
<td>651</td>
<td>575.16**</td>
<td>0.116</td>
<td>0.91</td>
<td>0.90</td>
<td>0.105</td>
</tr>
<tr>
<td>Faculty and student support on one factor</td>
<td>1847.81</td>
<td>651</td>
<td>542.90**</td>
<td>0.121</td>
<td>0.91</td>
<td>0.90</td>
<td>0.124</td>
</tr>
<tr>
<td>Parental and student support on one factor</td>
<td>2256.45</td>
<td>651</td>
<td>951.54**</td>
<td>0.143</td>
<td>0.88</td>
<td>0.87</td>
<td>0.162</td>
</tr>
</tbody>
</table>

** p < 0.01
Figure 2

Standardized Path Coefficients

Academic Success

Responsibility

Organizational Commitment

Professional Commitment

Faculty Support

Parental Support

Student Support

0.03 ns

0.32 **

0.72 ***

0.13 ns

0.23 **

0.07 ns

0.16 *

0.33 ***

* p < 0.05

** p < 0.01
Hypothesis Testing

The structural model also fit the data well, \( \chi^2 (653, N = 156) = 1335.46 \), root mean square error of approximation (RMSEA) = 0.079, comparative fit index (CFI) = 0.95, non-normed fit index (NNFI) = 0.94, and the standardized root mean square residual (SRMR) = 0.078 (Jackson et al., 2009). The authors tested the hypotheses by checking significance of the path coefficients in the model. Hypothesis 1a was supported since the path from perceived faculty support to institutional commitment (\( \gamma_{11} = 0.73, p < 0.01 \)) was significant while Hypothesis 1b was not (\( \gamma_{21} = 0.13, \text{ns} \)). Both Hypotheses 2a and 2b were supported as both paths from parental support to the commitment variables were significant (\( \gamma_{12} = 0.11, p < 0.05 \) and \( \gamma_{22} = 0.23, p < 0.01 \), respectively). Hypothesis 3a was not supported since the path from perceived fellow student support to institutional commitment (\( \gamma_{31} = 0.07, \text{ns} \)) was not significant while Hypothesis 3b was supported (\( \gamma_{31} = 0.33, p < 0.01 \)). Both Hypotheses 4a and 4b were supported as both paths from institutional commitment and professional commitment to felt responsibility were significant (\( \beta_{31} = 0.32, p < 0.01 \) and \( \beta_{22} = 0.16, p < 0.05 \), respectively). Hypothesis 5 was not supported since the path from felt responsibility to academic performance was not significant (\( \beta_{43} = 0.03, \text{ns} \)). See Figure 2.

DISCUSSION

This paper provides a unique contribution by applying organizational support theory constructs, generally used in the workplace, to students in an academic environment. Institutions of higher learning are organizations and as such one would expect much of organizational behavior theory to apply. However, student academic environments also have distinctive characteristics that may change the dynamic of how OST variable relationships behave. In testing the model in Figure 2, the authors found that some of the constructs appeared to behave similarly to previous research in OST and education while some did not.

First, H1a (PFS to OC) was supported providing evidence that faculty support relates to organizational commitment. In a time when faculty are spread thin between competing priorities, it is important to realize the significant role they play in affecting students' feelings of connection to their institutions. Obviously, it is imperative that faculty continue to engage students at every opportunity and keep this activity as a main concern. On the other hand, H1b (PFS to PC) was not supported. This outcome was unexpected. One reason for this outcome might be that faculty were not active enough in professional activities with students to be seen as representatives of the profession.

Second, H3b (PSS to PC) was supported substantiating the need for peer support in the academic environment in terms of student commitment to their degree/profession and university. Clearly, as in the workplace, coworker or peer relationships are significant in their role of creating a sense of belonging and identification with an institution or a profession. However, H3a (PSS to OC) was not supported. This is surprising since both the OST and educational literature previously found peer support related to organizational or institutional commitment.
Overall, these results suggest that institutions should find ways for faculty to engage students, as well as ways that students can engage each other. Student professional organizations seem a natural fit to encourage both faculty and peer support. These organizations provide ample opportunities for faculty to get to know students in a more personal way in addition to providing activities for students to get to know each other. Most institutions have several student professional society chapters, leveraging these groups may provide even more benefits than the obvious professional development prospects. Colleges should encourage all students to be engaged in one or more student groups and should require each group to have one or more faculty advisers.

Both H2a (PPS to OC) and H2b (PPS to PC) were supported. This replicates educational research that suggests parental support is an essential ingredient to students' feelings of commitment to their institutions and professions. Hence, if a parent fails to support the student's choice of institution or profession, it could be detrimental to the student's commitment. Perhaps colleges could have parent nights where parents visit professional organizations either on campus or online and have an opportunity to engage their children on campus and see the academic environment. This might elicit more support from parents resulting in higher student commitment.

H4a (OC to FR) and H4b (PC to FR) were supported. This replicates OB findings in the workplace. In this study, both OC and PC were also found to be positively related to felt responsibility but in an academic environment as opposed to the workplace.

H5 (FR to AP) was not supported. One reason may be social desirability bias. Students may have responded in a way they thought was desirable in regard to the construct of responsibility. In this study, felt responsibility had a high mean and low standard deviation (students responded very similarly). This may demonstrate a bias by the students to inflate their level of responsibility. Another reason could be that students may acknowledge that they themselves are responsible for academic outcomes, but when it comes to discharging this responsibility they fall short.

Limitations and Future Research

A limitation of this study was the cross-sectional and non-experimental research design. Causal inferences must be treated with extreme caution when interpreting results from research designs of this type. That said, in terms of the ordering of the latent variables the findings of this study were consistent with prior research and the hypothesized model. The study tested the order empirically. Using the same data, latent variables and manifest variables were estimated in a model in which the order of the latent variables was reversed. Because these models are not nested, they cannot be tested against each other with the chi-square difference test. Therefore, they were compared on the basis of the Akaike information criteria (AIC) and the Bayesian information criteria (BIC). The AICs for the hypothesized and alternative model were 1457 and 1460, respectively, and the BICs were 1779 and 1788, respectively. When using the AIC and the BIC to compare models, the model with the higher number cannot be preferred over the model with the lower number. Hence, it cannot “be proven” that the hypothesized model is superior to the alternative model. However,
the analyses show that the alternative model in which the order of the latent variables was reversed cannot be preferred over the hypothesized one. Even with strong theoretical underpinnings for the order of the variables in the model and the empirical results of the AIC and BIC comparisons, the limitations associated with a cross-sectional design remain and causal inferences should be withheld.

Other limitations include the use of only business majors and the lack of contextual descriptions of the participants. Future research should include an examination of different majors. In addition, issues such as whether students were athletes, commuters, or returning students could possibly shed further light on the relationships between the variables and their importance.

Future research may also delve into the use of more OB constructs in studies of an academic nature. For example, one construct the authors did not choose, but one that might be extremely interesting to examine in an academic setting, would be intent to quit the organization. Would students respond similarly to employees in the workplace on this measure? The authors think such questions would be quite thought-provoking and provide even greater understanding of academic issues.

**SUMMARY**

In summary, the authors believe this study provides a unique contribution by determining OST antecedents to the constructs of organizational commitment and professional commitment in an academic environment. This result is interesting and may provide ideas to faculty and administrators interested in retaining students.

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Social Networks and Corporate Performance: The Moderating Role of Technical Uncertainty

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Between the rise of globalization and the development of information technology, the complexity of the operating environment in industry increases daily, perhaps making intangible assets the key to competitive advantage (Norton and Kaplan, 1996, 2003). Social networks, one such significant intangible asset, have gained prominence in recent years (e.g., Gulati et al., 2000; Koka and Prescott, 2002). The analyses of social networks are tied to multiple levels: individual, firm, and regional. This paper focuses primarily on social networks at the firm level. That is, firm network is being referenced. In terms of firms, social networks refer to a set of firms that are connected by a specific type of social relationship. Prior research has suggested that interfirm networks facilitate the transmission of information and the access to unique resources and thus can be thought of as an inimitable and non-substitutable asset (Gulati, 1999; Palmer et al., 1995). A number of studies have also suggested that social networks provide several benefits for firms, such as learning benefits (e.g., Powell et al., 1996), coordination benefits (e.g., Coleman, 1990; Uzzi, 1997), performance benefits (e.g., Maurer and Ebers, 2006), and increasing legitimacy (e.g., Higgins and Gulati, 2003). Therefore, whether and how social networks improve corporate performance has become a dominant theme in strategy and organizational research (see, e.g., Carpenter and Westphal, 2001; Goerzen, 2007; Zollo et al., 2002).

However, extant research examining the performance effects of social networks reports mixed results. Some research has found a positive impact: Carpenter and
Westphal (2001) found that social networks formed by members of the boards of directors helped to obtain useful corporate strategy information and increase corporate performance; Inkpen and Tsang (2005) found that social networks not only promoted knowledge transfer among members of a network but also between union firms, thus promoting performance and innovation; Sorenson et al. (2009) found a positive impact of network ties in family businesses on corporate performance. Other research has found a negative impact: Goerzen and Beamish (2005) found that international companies with more diverse networks had, on average, lower economic performance than international companies with less diverse networks; Goerzen (2007) pointed out that social networks had a negative impact on corporate performance when there was a greater overlap of organizational partners. These conflicting findings reveal two possibilities. One is that the relationship between social networks and corporate performance might be nonlinear. Another is that the value of social networks might depend on a number of moderators and contingencies (e.g., Gulati and Higgins, 2003; Gupta et al., 2011; Hansen et al., 2001; Rowley et al., 2000).

To clarify the relationship between social networks and corporate performance, this research extends previous research about the performance impacts of social networks (e.g., Goerzen, 2007; Goerzen and Beamish, 2005) by exploring whether the relationship between social networks and corporate performance is a non-linear inverted U-shape curve. The authors particularly focus on examining network centrality, which signifies a firm’s network position and determines the set of resources and information the firm could mobilize through social networks (Davis, 1991). When an organization has a higher network centrality, it can receive and transfer a greater amount of information, and therefore has an advantage in controlling information transfer and can benefit more from social networks. Despite that several other network properties have been studied in prior research, such as network structure and network composition, a firm’s network position plays an important role in securing timely access to novel information and benefiting from social networks. Obtaining access to a greater number of more diverse information through a central position also comes at a price. It thus provides a good opportunity to understand the nonlinear relationship between social networks and corporate performance. Therefore, this study uses network centrality to examine the performance effects of social networks. Furthermore, the authors examine if the relationship between social networks and corporate performance is moderated by the level of technical uncertainty.

Technical uncertainty refers to the extent to which the complexity of the product or process technologies changes (Fynes et al., 2004; Ragatz et al., 2002). Burt (1992) believed that the uncertainty of production process and technical characteristics affect the firms’ investment in social networks. Several papers point out that companies are more likely to make up for their inadequacies through organizational cooperation when they are faced with technical uncertainties (Robertson and Gatignon, 1998; Teece, 1992). In particular, companies rely more on interfirm networks to access different resources and information in an uncertain environment (Sparrowe et al., 2001; Westphal et al., 2006). Ragatz et al. (2002) indicated that technical uncertainty was an important factor for firms to consider when they select partners. As technical uncertainty is the major challenge faced by high-tech companies, this study explores how it affects the social network-performance relationship.
This study defines interfirm relationships by the interlocks which are created by either of the following two conditions: one is that a firm’s CEO, senior management, or directors sit on the boards of other firms; another is that any board member who is primarily affiliated with another firm as the CEO, senior manager, or director. Existing literature generally agrees that interlocks are created for the firm’s needs rather than for the individual’s benefits (Mizruchi, 1996). Thus, the interlocks have been widely used in prior studies to measure interfirm networks (Grandori and Soda, 1995; Koenig and Gogel, 1981). Using interfirm network data collected in 2007 from high-tech companies in Taiwan, this research found the relationship between social networks and corporate performance, as measured by sales growth, is inverted U-shape. Specifically, when network centrality begins to increase, sales growth increases until it reaches equilibrium after which it begins to decrease with the increase of network centrality. This shows too much network centrality has a negative impact on corporate financial performance, while moderate network centrality can lead to the greatest performance in a company. Therefore, the higher the level of technical uncertainty companies face, the more companies may rely on building social networks to gain necessary resources and promote business development.

This study extends the literature in the following ways: first, previous studies examining the performance effects of social networks have not reached a consensus (e.g., Carpenter and Westphal, 2001; Goerzen, 2007; Inkpen and Tsang, 2005). This research shows that the relationship between social networks and corporate performance is not a linear monotonically increasing relationship but rather a non-linear inverted U-shape curve. It provides one explanation for the mixed results. Specifically, most of prior research consider social networks as valuable assets and consistently infer that social networks positively affect the economic outcomes of firms. However, this study suggests the possibility to benefit from social networks is importantly conditioned on a firm’s network position. Though central firms benefit from having timely access to novel information, they also bear higher costs to absorb and integrate a greater number of more diverse information. Hence, understanding the value of social networks requires a dual emphasis on the benefits obtained and the costs incurred. Second, most prior studies about the value of social networks focus on investigating the direct impact of social networks on economic performance (e.g., Goerzen and Beamish, 2005; Kim, 2005). This study suggests that the benefits of social networks vary based on the characteristics of the technical environment, indicating that the value of social networks is dependent on the external environment. Moreover, this study contributes to the current literature by identifying an important moderator, technical uncertainty.

This research provides several managerial implications as well: first, gaining more social networks may be detrimental to corporate growth, meaning that companies should find a balance between the cost and benefit of building social networks to find the optimal level of investment; second, the optimal level of investment in social networks varies depending on the environment that companies face, meaning that companies should build social relationships based on their needs rather than blindly pursuing connections to other firms; third, when a company faces greater technical uncertainty.
uncertainty, it may rely more on inter-organizational networks to decrease R&D risks and increase company effectiveness.

In the remainder of this paper, the authors will briefly review the literature and develop two testable hypotheses. The authors then describe the research methodology. Subsequently, the implications of empirical findings will be discussed. Finally, this study raises some concluding remarks with implications for both managers and scholars.

THEORETICAL DEVELOPMENT

Definition of Social Networks

A social network is broadly defined as a set of nodes that are connected by a specific type of social relationship (Laumann, 1978). Here, nodes may refer to individuals, events, organizations, or firms. That is, social networks could refer to the specific relational connections between a group of people, individual firms, or specific events, etc. (Knoke and Kuklinski, 1982). Generally, social network constructs encompass individual, interfirm, and intrafirm networks. In terms of interfirm networks, the relationships can be various kinds, such as supplier-buyer, firm-customer, and regulator-firm, etc. This study defines the interfirm relationships by the interlocks, which is the most widely employed measure of interfirm networks (Mizruchi, 1996). In general, actors within a network may repeatedly and consistently interact with each other (Podolny and Page, 1998) to obtain resources, technical, or emotional support (BarNir and Smith, 2002).

As argued in prior literature, social networks are highly associated with social capital (Lin, 2001). Social capital encompasses all types of relationships and all levels, such as individual and firm, and can be analyzed from different perspectives. Based on the network perspective, social capital bears potential value as it provides an opportunity for actors to access information and resources in their social networks (Maurer and Ebers, 2006). This concept of social capital has been discussed extensively since the mid-1980s (e.g., Bourdieu, 1980; Coleman, 1990; Flap, 1988, 1991, 1994). The core intuition behind these definitions offered is that social capital signifies resources that are embedded in social relationships and in the social structure that can be mobilized by the firm to increase the success rate for certain actions (Lin, 2001). In other words, social capital is an investment in social relationships by an organization expecting returns from the market (Biggart and Castanias, 2001; Burt, 1992; Coleman, 1988, 1990). Therefore, this study employs the network perspective to examine whether social networks are valuable and particularly focuses on interfirm networks.

Social Networks and Corporate Performance

From an organizational sociology viewpoint, connections between two or more “actors” bring out specific characteristics and interactions, and “relationships” are produced through the interactions of the actors. There are four theories in the literature based on inter-organizational relations: resource dependence theory,
transaction cost theory, network theory, and social capital theory. The first three theories emphasize observation of the position of each separate organization within a network and how they “build relationships” with other organizations. Social capital theory attempts to understand why the network relationships are formed within a network.

According to resource dependence theory, firms are dependent on their external environment for resources that are essential for their functioning (Goes and Park, 1997). Specifically, since firms cannot generate all necessary inputs, they exchange with other firms to obtain them (Cummings, 1984; Pfeffer and Salancik, 1978). Transaction cost theory states mutual benefit and standards between organizations within a network minimize information asymmetry, which then decreases the chance of opportunism (Kogut, 1988, 1989), and decreases the cost of consultation, contracting, and supervision, thus adding creative value for the organization (Pisano et al., 1988). Also, organizational networks provide a channel to relay information at a far faster rate that greatly exceeds the amount that an organization could find within itself, making it more valuable (Burt, 1992). Network theory suggests that different companies have varying amounts of resources and capabilities, and therefore working through connections with other companies helps integrate diverse bases of knowledge of technology or the market, thus creating synergy (Burt, 1980; Granovetter, 1973; Lin, 1998).

Interlocks are considered one type of interfirm relationship (Grandori and Soda, 1995; Mizruchi, 1996). A network of interlocks may bring benefits for firms. For example, interlock networks provide firms with the opportunity to exchange firm-specific information and general industry information, which allow firms to be more responsive to their environments (Allen, 1974; Burt, 1979). Interlock ties also allow firms to improve inter-organizational coordination and reduce transaction costs (Palmer, 1983; Pfeffer and Salancik, 1978). Furthermore, prior studies suggest that a firm’s network position is an important aspect of social structure that can enhance the firm’s ability to benefit from network ties and to achieve economic goals (e.g., Gilsing et al., 2008; Tsai and Ghoshal, 1998). Specifically, an interlock network provides channels for firms to exchange their resources and information. However, such resources and information are usually distributed unevenly within a network. Different network positions represent different opportunities for a firm to access required resources and information.

By occupying a central network position, firms can obtain a greater amount of information through the networks (Sparrowe et al., 2001). Specifically, because central firms have greater connections to others, they have more relationships to draw from in obtaining information (Cook and Emerson, 1978). When an organization receives more diverse information, senior management is more likely to use that information to identify market opportunities and improve corporate performance. Also, a central position is associated with greater power and control (Cook and Whitmeyer, 1992). With higher network centrality, firms have greater control over resources because they can choose from a greater number of alternative firms in sharing beneficial resources. In addition, central firms are more likely to exert supervision and sanctions to decrease the probability of members behaving opportunistically (Antia and Frazier, 2001; Coleman, 1988). Furthermore, as several scholars have argued, network
centrality can enhance a firm’s ability to create value (e.g., Coleman, 1990; Tsai and Ghoshal, 1998), which will improve the firm’s corporate financial performance.

However, building social networks is not costless. The differences in business operation methods within the network may lead to a greater chance that members lack a common target and therefore the motivation for cooperation (Goerzen and Beamish, 2005; Rindfleisch and Moorman, 2001). Also, a company occupying a more central position in the network must invest large amounts of capital to hold together its many network relationships. Besides, with higher network centrality, firms have to deal with a higher volume of more diverse information (Gnyawali and Madhavan, 2001). This consumes time and resources that cannot be allocated to integrating the new insights (Gilsing et al., 2008). Also, overly high centrality might impede a firm’s capability to absorb and digest information it obtained (Ahuja and Katila, 2004), which has a negative impact on corporate performance. When potential losses incurred by inter-organizational network ties outweigh the potential benefits, a social network may not only have no benefits to corporate performance but may instead be detrimental to the company.

In summary, with increasing network centrality firms can obtain more diverse information and have greater control over resources. Also, opportunistic behavior may be minimized. However, overly high network centrality may increase the cost of maintaining the network, and increase the cost of absorbing and integrating the acquired information, which has a negative impact on corporate growth. Therefore, this study predicts an inverted U-shaped relationship between social networks and corporate performance, and the following hypothesis is developed:

**H1**: Social networks have an inverted U-shaped relationship with corporate performance.

**The Moderating Effect of Technical Uncertainty**

Technical uncertainty is an important aspect of external environments. Scholars have debated the effect of technical uncertainty on corporate performance, particularly with regard to high-tech industries. In an environment of high technical uncertainty, current technology may soon become outdated and firms need to become involved in different fields of technology to expand and extend their knowledge base (Cohen and Levinthal, 1989; March, 1991). Increased complexity and interrelatedness leads to higher cost and lower benefits of R&D, which increases the variation in R&D effectiveness and further affects the variation in corporate R&D investments. The coefficient of variation for R&D intensity, therefore, could reflect the level of technical uncertainty firms are facing.

Based on resource dependence theory, firms could reduce the negative impact of environmental uncertainty through cooperative relationships with other firms (Burt, 1983; Pfieffer and Salancik, 1978; Palmer et al., 1995). In other words, a firm is more likely to rely on social relationships to meet its information needs and further improve its corporate performance in a technically uncertain environment. Through corporative relationships, firms can shorten the time involved in obtaining technology and the capital invested for research and development when technical uncertainty is high (Robertson and Gatignon, 1998).
Based on contingency theory, the degree of certainty of a firm’s external environment is an important moderator affecting a firm’s network structure and its performance (Gargiulo and Rus, 2002; Gulati and Gargiulo, 1999; Shaner and Maznevski, 2011). Several studies also indicate that the technological environment has a great impact on inter-organizational networks (e.g., Madhavan et al., 1998). More specifically, companies often look to gain key technical information through connecting with or establishing specific networks in a technically uncertain environment. Through cooperation, firms can make up for each other’s technical weaknesses and acquire critical knowledge to improve their technological capabilities at less cost (Hagedoorn, 1993, 1995). In particular, with higher network centrality, firms are more likely to have timely access to important and novel information through social networks. Firms thus are able to increase the possibility of achieving economic outcomes when facing technical uncertainty.

In contrast, in more certain environments, fewer interconnections are more than enough for firms to obtain information and resources necessary for their growth (Shaner and Maznevski, 2011). When technical uncertainty is higher, firms are more likely to gain new information and technology through these corporate networks. Increasing technical uncertainty increases a firm’s reliance on the information and knowledge from social networks. Being open to external sources enables firms to draw in ideas from outsiders to deepen the pool of technological opportunities available to them and thus improve their performance (Laursen and Salter, 2006). Therefore, it is expected that technical uncertainty will moderate the effect of social networks on corporate performance in such a fashion that increasing technical uncertainty will increase the positive effect of social networks on corporate performance, and increase the amplitude of the effects of social networks. The second hypothesis is as follows:

**H2:** The level of technical uncertainty moderates the relationship between social networks and corporate performance in such a fashion that increasing technical uncertainty will: (a) increase the positive effect of social networks on corporate performance; and (b) increase the amplitude of the effects of social networks.

**METHODS**

**Sample and Data Collection**

The research subjects are firms in the electronics industry publicly listed in Taiwan in 2007. The authors initially identified 365 electronics firms in this industry. After excluding those companies missing financial data, research and development costs, annual reports, and other related information, this research finally included 353 electronic firms in the sample. Electronics firms were chosen based on the Taiwan Economic Journal (TEJ) industrial classification of electronics firms, which includes those involving semiconductors, computer and peripheral products, optoelectronics, communications networks, electronic components, data services, and other electronic services. All data were found in the Taiwan Economic Journal (TEJ) Database.
Variables Measurement

**Dependent Variables.** Following prior studies (e.g., Maurer and Ebers, 2006), this research measures corporate performance through the firm’s sales growth rate. In the electronics industry, an increase in sales revenue indicates successful research and development of industrial products. Besides, the sales growth rate is a variable that is viewed as less noisy than other accounting metrics (Kor and Sundaramurthy, 2009), and is likely to be closely linked to network structure, since the connections in a network may contribute to the variables related to sales. Therefore, this study uses sales growth rate to measure corporate performance ($PF$). Sales growth rate is calculated by first subtracting sales revenue of year 2007 from sales revenue of year 2008 to produce the change in sales revenue and then dividing the change in sales revenue by sales revenue of year 2007.

**Independent Variables.** In terms of measuring corporate social networks, this study based its analysis on Nicholson et al. (2004). First, a two-way matrix is formed based on whether or not the chief executive officer (CEO), senior management, or directors of the company sit on the boards of another company; or if any board member of the company is primarily affiliated with another company as the CEO, senior manager, or director. If either of the above two conditions were met, then these two companies were found to be related and were marked as 1 in the matrix. If they were not related, they were marked as 0. Prior studies indicate that a firm can access resources or information from other firms by having ties to their boards (Mizruchi, 1996, 2004; Scott, 1991).

After establishing a two-way matrix of whether a company has relationships with another company, this study employs the eigenvector centrality measure proposed by Bonacich’s (1987) in the evaluation of social networks before finally using UCINET network analysis software to make the final calculations. Network centrality refers to the position in a network, with a higher network centrality indicating a more central position, therefore making it closer to the core of the network. Eigenvector centrality can be seen as a weighted sum of both direct connections and indirect connections of every length. A higher eigenvector centrality score represents that the paths connecting the focal firm’s position to other positions are the highly weighted short paths (Bonacich, 1987). As indicated in prior literature, this measure has advantages over other centrality measures (Bonacich, 2007). Different from degree-based centrality, which gives every contact an equal weight, the eigenvector centrality weights contacts according to their centralities. Thus, it takes into account the entire pattern in the network while other centrality measures do not.

As for the measurement of technical uncertainty (TU), this study first divided annual research and development expenditures by the year’s sales revenue to find the R&D intensity for each year from 2003-2007, then obtained the standard deviation of R&D intensity and the mean of R&D intensity during the five-year period. This study further divided the standard deviation of R&D intensity rate by mean R&D intensity to obtain the coefficient of variation for R&D intensity, which is used to measure the technical uncertainty.

**Control Variables.** In order to avoid interference from other factors in the evaluation of the relationship between social network and corporate performance, this
study incorporated the research by Goerzen (2007) and Kim (2005), including industry profitability, capital structure, firm size, R&D intensity, the scale of assets, and company age as control variables. Firm size (SIZE) is measured by taking the natural log of the number of company employees for the year. Industry profitability (INP) is measured by the industrial average return of assets. Capital structure (LEV) is measured by the financial leverage. The financial leverage is calculated by dividing total debt by shareholders’ equity. R&D intensity (RD) is calculated by dividing annual R&D expenditures by the year’s sales revenue. The scale of assets (TA) is calculated by taking the natural logarithm of total assets. Previous literature suggests that the scale of total assets affects corporate performance and therefore it is used as a control variable. Company age (AGE) is calculated by subtracting the year the company was established from the year of the sample data.

**Empirical Models**

To test Hypothesis 1, this study uses Kim’s (2005) non-linear regression model with both linear social network and squared social network measures in the regression model. That is, the model is designed as a quadratic function. If the coefficient for the linear social network variable is positive, and the coefficient for the squared social network variable is negative, then it is suggested that there is an inverted U-shaped curve. The regression model is as follows:

\[
P_{it} = a_0 + \beta_1 SC_{it} + \beta_2 SC_{it}^2 + \beta_3 TU_{it} + \beta_4 SIZE_{it} + \beta_5 INP_{it} + \beta_6 LEV_{it} + \beta_7 RD_{it} + \beta_8 TA_{it} + \beta_9 AGE_{it} + \epsilon_{it}
\]

where,

- \(PF_{it}\) = the sales growth of company \(i\) in year \(t\).
- \(SC_{it}\) = the social network of company \(i\) in year \(t\).
- \(SIZE_{it}\) = the natural log of the number of company employees for company \(i\) in year \(t\).
- \(INP_{it}\) = net profits after taxes divided by total assets for company \(i\) in year \(t\).
- \(LEV_{it}\) = debt equity ratio for company \(i\) in year \(t\).
- \(RD_{it}\) = annual R&D expenditures divided by the year’s sales revenue for company \(i\) in year \(t\).
- \(TA_{it}\) = the natural log of total assets for company \(i\) in year \(t\).
- \(AGE_{it}\) = number of years since company \(i\) has been in business.

To test Hypothesis 2, this study added two interaction terms into Model 1 and developed the regression model as follows.

\[
P_{it} = a_0 + \beta_1 SC_{it} + \beta_2 SC_{it}^2 + \gamma_1 TU_{it} + \gamma_2 TU_{it}^2 + \beta_3 SIZE_{it} + \beta_4 INP_{it} + \beta_5 LEV_{it} + \beta_6 RD_{it} + \beta_7 TA_{it} + \beta_8 AGE_{it} + \epsilon_{it}
\]

where,

- \(TU_{it}\) = the coefficient of variation for R&D intensity of company \(i\) in year \(t\).

The definitions of the other variables are the same as in the first model (M1).
Descriptive Statistics

There are 353 firms included in the sample of this study. As seen in Table 1, the lowest value of social network (SC) was 0, the highest was 73.73, and the average was 12.44. This shows that there is a great difference in social network between companies. The lowest performance (PF) was -78.99%, indicating the firm’s sales revenue of the current year dropped 78.99% compared to sales revenue of the prior year. The highest performance was 1111.83%, the average was 25.77%, and the growth rate data were not skewed. As for technical uncertainty, the minimum value was 0, the maximum value was 2.24, and the average was 0.41. This shows that there is a wide range in the level of technical uncertainty that sample firms face.

Table 1
Descriptive Statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Min</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>353</td>
<td>0</td>
<td>12.44</td>
<td>14.10</td>
<td>73.73</td>
</tr>
<tr>
<td>SC²</td>
<td>353</td>
<td>0</td>
<td>353.00</td>
<td>660.75</td>
<td>5435.97</td>
</tr>
<tr>
<td>TU</td>
<td>353</td>
<td>0</td>
<td>0.41</td>
<td>0.43</td>
<td>2.24</td>
</tr>
<tr>
<td>SIZE</td>
<td>353</td>
<td>1.10</td>
<td>6.12</td>
<td>1.31</td>
<td>10.11</td>
</tr>
<tr>
<td>INP (%)</td>
<td>353</td>
<td>6.74</td>
<td>8.94</td>
<td>1.65</td>
<td>11.59</td>
</tr>
<tr>
<td>RD (%)</td>
<td>353</td>
<td>0</td>
<td>3.64</td>
<td>4.46</td>
<td>31.21</td>
</tr>
<tr>
<td>LEV (%)</td>
<td>353</td>
<td>2.26</td>
<td>40.58</td>
<td>16.89</td>
<td>92.43</td>
</tr>
<tr>
<td>TA</td>
<td>353</td>
<td>5.56</td>
<td>6.90</td>
<td>0.60</td>
<td>8.94</td>
</tr>
<tr>
<td>AGE</td>
<td>353</td>
<td>1.00</td>
<td>19.26</td>
<td>9.64</td>
<td>57.00</td>
</tr>
<tr>
<td>PF (%)</td>
<td>353</td>
<td>-78.99</td>
<td>25.77</td>
<td>91.53</td>
<td>1111.83</td>
</tr>
</tbody>
</table>

Table 2 shows the correlation matrix for all variables. Spearman rank correlation coefficients are listed on the upper right hand side and Pearson correlation coefficients on the lower left hand side. As shown in Table 2, firm size (SIZE) is positively correlated with linear social network variable (SC). Firm age (AGE) is negatively correlated with linear social network variable (SC). However, linear social network variable (SC) is not positively correlated with corporate performance (PF), which needs to be further examined with regression analyses. Besides, all correlation coefficients other than the correlation between linear social network variable and squared social network variable are below 0.8, meaning that there is no
multicollinearity existing. In regression analyses, this study will further use the variance inflation factor (VIF) to test for multicollinearity and correct the problem if necessary. Specifically, if the VIF does not exceed 10, then the regression model is not affected by multicollinearity (Hair et al., 1998).

Table 2

<table>
<thead>
<tr>
<th>Variables</th>
<th>SIZE</th>
<th>INP</th>
<th>RD</th>
<th>LEV</th>
<th>RD</th>
<th>TA</th>
<th>AGE</th>
<th>PF</th>
<th>SC</th>
<th>SC^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>1</td>
<td>0.010</td>
<td>0.122**</td>
<td>0.002</td>
<td>0.728***</td>
<td>0.007</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INP</td>
<td>0.072</td>
<td>1</td>
<td>-0.243***</td>
<td>0.143***</td>
<td>-0.059</td>
<td>-0.012</td>
<td>0.018</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>LEV</td>
<td>0.064</td>
<td>-0.254***</td>
<td>1</td>
<td>-0.481***</td>
<td>0.336***</td>
<td>0.131***</td>
<td>0.015</td>
<td>0.008</td>
<td>0.008</td>
<td>0.046</td>
</tr>
<tr>
<td>RD</td>
<td>0.068</td>
<td>0.238***</td>
<td>0.428***</td>
<td>1</td>
<td>-0.224***</td>
<td>-0.165***</td>
<td>-0.205***</td>
<td>0.074</td>
<td>0.074</td>
<td>-0.143***</td>
</tr>
<tr>
<td>TA</td>
<td>0.750***</td>
<td>0.037</td>
<td>-0.274***</td>
<td>-0.168***</td>
<td>1</td>
<td>0.040</td>
<td>0.026</td>
<td>0.026</td>
<td>0.026</td>
<td>0.255***</td>
</tr>
<tr>
<td>AGE</td>
<td>0.015</td>
<td>-0.023</td>
<td>0.151***</td>
<td>0.169***</td>
<td>0.055</td>
<td>1</td>
<td>-0.189***</td>
<td>-0.277***</td>
<td>-0.277***</td>
<td>-0.159***</td>
</tr>
<tr>
<td>PF</td>
<td>0.035</td>
<td>-0.064</td>
<td>-0.003</td>
<td>-0.126***</td>
<td>0.023</td>
<td>0.243***</td>
<td>1</td>
<td>0.054</td>
<td>0.054</td>
<td>0.100***</td>
</tr>
<tr>
<td>SC</td>
<td>0.392***</td>
<td>0.000</td>
<td>-0.003</td>
<td>-0.029</td>
<td>0.325***</td>
<td>0.047</td>
<td>1</td>
<td>0.047</td>
<td>0.047</td>
<td>0.020</td>
</tr>
<tr>
<td>SC^2</td>
<td>0.288***</td>
<td>-0.022</td>
<td>0.015</td>
<td>0.010</td>
<td>0.314***</td>
<td>-0.229***</td>
<td>0.002</td>
<td>0.002</td>
<td>0.002</td>
<td>0.917***</td>
</tr>
<tr>
<td>TU</td>
<td>-0.121***</td>
<td>0.007</td>
<td>0.027</td>
<td>-0.065</td>
<td>0.068</td>
<td>-0.187***</td>
<td>0.211**</td>
<td>0.020</td>
<td>0.020</td>
<td>0.012</td>
</tr>
</tbody>
</table>

Table 2

Correlation Matrix

Pearson coefficients appear in the lower triangle; Spearman coefficients appear in the upper triangle.


b. 1% significant level; 5% significant level; 10% significant level.
Regression Results

Table 3 shows the results of the regression analysis on the relationship between social networks and corporate performance. The first column of Table 3 presents the results of the respective baseline model including all of the control variables as well as the moderating variable. As expected, the explanatory power of the baseline model (adj. $R^2 = 0.108$) is lower than the explanatory power of the model with social network measures (Model 1). In particular, the model with social network measures and the interaction terms (Model 2) has the highest explanatory power (adj. $R^2 = 0.152$). These results provide initial evidence that it is appropriate to look at technical uncertainty as the moderating variable in the relationship between social networks and corporate performance.

In Hypothesis 1, the relationship between a firm’s social network and its performance is suggested to be an inverted U-shape, implying that the social network enhances a firm’s sale growth. In Model 1 and 2, because the linear terms for social networks are positive and significant ($\beta_1 = 1.534$, t-value = 1.846 in Model 1, $\beta_1 = 1.945$; t-value = 2.369 in Model 2), whereas the squared terms for social networks are negative and significant ($\beta_2 = -0.038$, t-value = -2.161 in Model 1; $\beta_2 = -0.049$, t-value = -2.833). The first hypothesis is supported.

In Hypothesis 2, it is proposed that the level of technical uncertainty faced by a firm moderates the inverted U-shaped relationship between social networks and corporate performance so that the positive effect of social networks on corporate performance is stronger and the amplitude of the effects of social networks is greater when the firm faces higher levels of technical uncertainty. To test the hypothesis, this study inserted the interaction terms between the social network variables (linear and squared terms) and technical uncertainty in Model 2 when predicting corporate sales growth. Considering that the social network variables may be correlated with their respective interaction terms if the social network variables were multiplied by the technical uncertainty variable directly, this study first standardized social network variables and the technical uncertainty variable respectively. The standardization process is subtracting the mean of one variable from every value and then dividing by the standard deviation of that variable, which has been suggested to be an appropriate way for standardization in prior literature (e.g., Davis, 1986). Then, standardized social network variables (linear and squared terms) were multiplied by standardized technical uncertainty variable to produce the interaction terms. In Model 2, the results reveal that the interaction between the linear social network and technical uncertainty is positive and significant ($\gamma_1 = 22.651$, t-value = 3.423), whereas the interaction between the squared social network variable and technical uncertainty is negative and significant ($\gamma_2 = -18.861$, t-value = -4.062). These results imply that the relationship between social networks and corporate performance remains an inverted U-shape when assessing the moderating effect of technical uncertainty. As predicted, technical uncertainty moderates this relationship in such a fashion that the positive effect of social networks on corporate performance is stronger and the amplitude of the effects of social networks is greater when the firm faces higher levels of technical uncertainty. The results obtained support Hypothesis 2.
There are several measures of network centrality proposed in prior studies. In addition to Bonacich’s (1987) eigenvector centrality measure, the degree-based centrality measure proposed by Freeman (1979) is widely used (e.g., Tsai, 2001). To increase the robustness of empirical results, this study additionally used Freeman’s

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Expected Sign</th>
<th>Baseline Model</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Coefficient</td>
<td>Coefficient</td>
<td>Coefficient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t-value)</td>
<td>(t-value)</td>
<td>(t-value)</td>
</tr>
<tr>
<td>Constant</td>
<td>?</td>
<td>185.815***</td>
<td>177.595**</td>
<td>157.576**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.690)</td>
<td>(2.546)</td>
<td>(2.301)</td>
</tr>
<tr>
<td>SC</td>
<td>+</td>
<td>--</td>
<td>1.534*</td>
<td>1.945**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1.846)</td>
<td>(2.369)</td>
</tr>
<tr>
<td>SC2</td>
<td>-</td>
<td>--</td>
<td>-0.038**</td>
<td>-0.049***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-2.161)</td>
<td>(-2.833)</td>
</tr>
<tr>
<td>SC.TU</td>
<td>+</td>
<td>--</td>
<td>--</td>
<td>22.651***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3.423)</td>
</tr>
<tr>
<td>SC2.TU</td>
<td>-</td>
<td>--</td>
<td>--</td>
<td>-18.861***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td>(-4.062)</td>
</tr>
<tr>
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<td>35.507***</td>
<td>35.327***</td>
<td>76.105***</td>
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<tr>
<td></td>
<td></td>
<td>(3.223)</td>
<td>(3.219)</td>
<td>(5.172)</td>
</tr>
<tr>
<td>SIZE</td>
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<td></td>
<td></td>
<td>(2.081)</td>
<td>(2.186)</td>
<td>(2.350)</td>
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<td>INP</td>
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<td>-3.046</td>
<td>-3.361</td>
<td>-4.390</td>
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<td></td>
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<td>(-1.033)</td>
<td>(-1.143)</td>
<td>(-1.518)</td>
</tr>
<tr>
<td>LEV</td>
<td>-</td>
<td>-0.161</td>
<td>-0.151</td>
<td>-0.015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-0.501)</td>
<td>(-0.471)</td>
<td>(-0.049)</td>
</tr>
<tr>
<td>RD</td>
<td>+</td>
<td>-3.506***</td>
<td>-3.539***</td>
<td>-3.139***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-2.987)</td>
<td>(-3.025)</td>
<td>(-2.714)</td>
</tr>
<tr>
<td>TA</td>
<td>+</td>
<td>-22.608*</td>
<td>-22.287*</td>
<td>-22.752*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-1.824)</td>
<td>(-1.770)</td>
<td>(-1.845)</td>
</tr>
<tr>
<td>AGE</td>
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<td>-2.224***</td>
<td>-2.042***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-4.408)</td>
<td>(-4.320)</td>
<td>(-4.021)</td>
</tr>
</tbody>
</table>

N       353 353 353
Adj R²  0.108 0.115 0.152
F-value 7.092*** 6.084*** 6.750***
(p-value) (0.000) (0.000) (0.000)

***: 1% significant level; **: 5% significant level; *: 10% significant level.
(1979) concept in the evaluation of network centrality and then replaced eigenvector centrality measure with this degree-based centrality measure to reanalyze model (M1) and model (M2) as reported in Table 4. Specifically, this study employs a normalized in-degree centrality. In-degree centrality represents the total number of firms with which a focal firm has direct relationships. A normalized in-degree centrality is created by normalizing in-degree centrality into a value between zero and one. As Freeman (1979) indicated, this is a very suitable centrality measure for capturing an individual actor’s information access. The mean and the standard deviation of this network centrality measure is 0.62 and 0.71, respectively. As shown in Table 4, the explanatory power of the baseline model (adj. $R^2 = 0.108$) is less than the explanatory power of Model 1 and 2 (adj. $R^2 = 0.131$), showing the incremental explanatory power of social network variables and the interaction terms. In Model 1 and 2, the linear social network variable is significantly positive ($\beta_1 = 31.612$, t-value = 1.907 in Model 1; $\beta_1 = 34.064$, t-value = 2.056 in Model 2), whereas the squared social network variable is significantly negative ($\beta_2 = -12.253$, t-value = -1.802 in Model 1; $\beta_2 = -14.246$, t-value = -2.046 in Model 2), indicating that the relationship between social networks and corporate performance is inverted U-shaped. These results are consistent with Table 3, supporting Hypothesis 1.

This study further examines the moderating effect of technical uncertainty. Empirical results are reported in the third column of Table 4. To address the multicollinearity issues, this study first standardized social network variables and the technical uncertainty variable and then produced the interaction terms. As shown in Table 4, the interaction between the linear social network variable and technical uncertainty is significantly positive ($\gamma_1 = 19.278$, t-value = 2.991) and the interaction between squared social network variable and technical uncertainty is significantly negative ($\gamma_2 = -12.707$, t-value = -2.270), indicating that the positive impact of social networks on corporate performance is stronger and the amplitude of the effects of social networks is greater when the firm faces higher levels of technical uncertainty. In summary, the empirical results support the predictions of Hypothesis 1 and 2.

CONCLUSION AND DISCUSSION

In recent years, social networks have become a popular topic of study in the management field. This study extends prior research by analyzing whether there is a non-linear relationship between social networks and corporate performance and how technical uncertainty moderates that relationship. Empirical findings show an inverted U-shaped relationship between social networks and corporate performance. That is, network centrality has a positive effect on corporate performance at first, but after it reaches a threshold level, higher centrality adversely affects corporate performance. This is contrary to many prior studies that assume the impact of social networks is linear. It is also found that the positive impact of social networks on corporate performance is stronger and the amplitude of the effects of social networks is greater when companies face higher levels of technical uncertainty. This means firms are more likely to rely on interfirm networks to obtain resources and knowledge while in more technically uncertain environments.
Table 4
Sensitivity Analyses: Relationship between Social Networks and Corporate Performance and the Moderating Effect of Technical Uncertainty

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Expected Sign</th>
<th>Baseline Model</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Coefficient</td>
<td>Coefficient</td>
<td>Coefficient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(t-value)</td>
<td>(t-value)</td>
<td>(t-value)</td>
</tr>
<tr>
<td>Constant</td>
<td>?</td>
<td>185.815***</td>
<td>191.559***</td>
<td>184.564***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.690)</td>
<td>(2.739)</td>
<td>(2.663)</td>
</tr>
<tr>
<td>SC</td>
<td>+</td>
<td>--</td>
<td>31.612*</td>
<td>34.064**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1.907)</td>
<td>(2.056)</td>
</tr>
<tr>
<td>SC^2</td>
<td>-</td>
<td>--</td>
<td>-12.253*</td>
<td>-14.246**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-1.802)</td>
<td>(-2.046)</td>
</tr>
<tr>
<td>SC.TU</td>
<td>+</td>
<td>--</td>
<td>--</td>
<td>19.278***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2.991)</td>
</tr>
<tr>
<td>SC^2.TU</td>
<td>-</td>
<td>--</td>
<td>--</td>
<td>-12.707**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-2.270)</td>
</tr>
<tr>
<td>TU</td>
<td>+</td>
<td>35.507***</td>
<td>35.035***</td>
<td>59.790***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.223)</td>
<td>(3.187)</td>
<td>(3.963)</td>
</tr>
<tr>
<td>SIZE</td>
<td>+</td>
<td>11.487**</td>
<td>11.527**</td>
<td>11.784**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.081)</td>
<td>(2.086)</td>
<td>(2.155)</td>
</tr>
<tr>
<td>INP</td>
<td>+</td>
<td>-3.046</td>
<td>-3.138</td>
<td>-4.165</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-1.033)</td>
<td>(-1.125)</td>
<td>(-1.421)</td>
</tr>
<tr>
<td>LEV</td>
<td>-</td>
<td>-0.161</td>
<td>-0.147</td>
<td>-0.086</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-0.501)</td>
<td>(-0.459)</td>
<td>(-0.271)</td>
</tr>
<tr>
<td>RD</td>
<td>+</td>
<td>-3.506***</td>
<td>-3.582***</td>
<td>-3.252***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-2.987)</td>
<td>(-3.055)</td>
<td>(-2.776)</td>
</tr>
<tr>
<td>TA</td>
<td>+</td>
<td>-22.608*</td>
<td>-24.683*</td>
<td>-25.390**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-1.824)</td>
<td>(-1.954)</td>
<td>(-2.031)</td>
</tr>
<tr>
<td>AGE</td>
<td>?</td>
<td>-2.194***</td>
<td>-2.098***</td>
<td>-1.912***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-4.408)</td>
<td>(-4.101)</td>
<td>(-3.737)</td>
</tr>
</tbody>
</table>

N: 353
Adj R^2: 0.108
F-value: 7.092***
(p-value): (0.000)

***: 1% significant level; **: 5% significant level; *: 10% significant level.

This research provides empirical support for the existence of both a positive and negative relationship between social networks and corporate performance. That is, once network centrality reaches some maximum level, the relationship between it and corporate performance becomes negative. The findings of this study have several important management implications: first, this research points out that the overuse of
social relationships may actually have a negative impact and harm corporate performance, meaning that companies should seek the optimum level of investment of social networks. Second, this research shows that the optimal level of social networks for each company may vary based on the technical environment. So, companies should take environmental factors into consideration when building social relationships and developing social networks. Finally, this study points out that network centrality is an important determinant of social networks while too much centrality may be detrimental to a firm. Firms should find the balance between linkage cost and information benefits to maximize corporate performance.

Regarding research limitations, this research focuses mainly on inter-organizational networks (i.e., external networks) but does not take internal networks into consideration. As social capital may arise from internal networks and external networks, future research may consider the interaction between internal networks and external networks to further understand how to integrate different types of network ties to reap the greatest benefit. Besides, it may be useful in future studies to consider the interaction between network centrality and other network properties, such as network density and network diversity to further understand the potential of a firm’s social networks. Finally, this study employs cross-sectional analysis to examine the performance impacts of social networks. An analysis of panel data or longitudinal data will be required to study how network dynamics affect corporate performance.

References


Achievement Goals in Organizations: 
Is there Support for Mastery-Avoidance?

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When individuals engage in achievement-related behaviors, such as working hard on work tasks, they have different purposes or goals in mind. Achievement goals describe these underlying aims for engaging in given achievement tasks and are thought to shape how individuals approach, experience, and react to achievement situations (Dweck and Leggett, 1988; Elliot, 2005). Performance-approach goals refer to striving to be the best relative to others, whereas performance-avoidance goals refer to a focus on avoiding being the worst. Mastery-approach goals take a different angle and instead focus on an individual learning as much as possible about a task. The most recently
The posited and most contested achievement goal is *mastery-avoidance*, defined as a “focus on avoiding self-referential or task-referential incompetence… [that entails] striving to avoid losing one’s skills and abilities (or having their development stagnate), forgetting what one has learned, misunderstanding material, or leaving a task incomplete” (Elliot and McGregor, 2001: 61).

These achievement goals are important for workplace behavior because adoption of different goals leads to different employee outcomes such as employee production (Donovan, 2009; Payne *et al.*, 2007), cooperation (Midgley *et al.*, 2001), emotional well-being, help-seeking, and cognitive engagement (Linnenbrink, 2005). Understanding these goals can help managers successfully motivate employees. For example, performance-avoidant individuals tend to avoid asking for help (VandeWalle and Cummings, 1997) because they are afraid of looking incompetent in front of others. Managers who are aware of this pattern can encourage learning over perfect performance and avoid punishing mistakes, resulting in an environment where even performance-avoidant individuals are more likely to seek out help when they need it. Furthermore, since those individuals endorsing performance goals may be more competitive, managers may want to encourage a more cooperative work environment through teamwork, or by modifying approaches to performance evaluation in order to focus on individual rather than comparative performance.

To better understand the newest achievement goal mastery-avoidance, Baranik *et al.* (2007) updated VandeWalle’s (1997) measure of achievement goals for a work setting to include a scale for the mastery-avoidance goal. The original study alone is insufficient to support general use of the instrument in the workplace since the study relied on a college student sample, and the authors cannot assume that the properties of the scale would extend to older worker populations (American Educational Research Association, American Psychological Association, National Council on Measurement in Education, 1999), especially when there is evidence that motivation changes across the lifespan due to the different competencies that college students are trying to master as compared to older individuals (Heckhausen, 2005). To empirically investigate whether the instrument can support inferences for other worker populations, the current paper provides a measurement invariance study comparing college-aged workers to older employees. This is a critical step in establishing the validity of the scale. If invariance is established, the existing validity evidence for the scale can be applied to worker populations, allowing management researchers greater confidence that scores from the scale accurately reflect the theoretical motivational goals. Without this work, the link between the scores on the scale and theoretical motivational goals, and therefore research using the scale, is tenuous.

**LITERATURE REVIEW**

Elliot (2005) suggested that individuals have different referents for gauging their competence on achievement-related tasks that shape which achievement goal is pursued. When using task referents (i.e., absolute standards) or self-referents (i.e., past performance), competence evaluations are linked to *mastery achievement goals*. In contrast, when using other individuals as referents, competence evaluations are linked to *performance achievement goals* (Elliot and McGregor, 2001). In addition to
differentiating between referents, the competence framework distinguishes valences of competence pursuit (Elliot, 2005; Elliot et al., 2002). Specifically, individuals can (a) approach competence, which would link to a mastery-approach and performance-approach achievement goal, or (b) avoid incompetence, which would be a mastery-avoidance or performance-avoidance achievement goal (Elliot, 2005). When viewed through the competency framework, the four achievement goals are easily understood as theoretically related yet distinct constructs.

Measurement of Achievement Goals in the Workplace

Together Baranik et al. (2007) and VandeWalle (1997) provide four scales written specifically for the work environment that correspond to the four achievement goals called the Achievement Goals at Work (AGW) scale. All four scales use a dispositional approach to measuring achievement goals at a mid-range of specificity. Among organizational researchers, VandeWalle’s (1997) instrument is the most common way to measure mastery-approach, performance-approach, and performance-avoidance goals. In order to empirically investigate whether the instrument can support inferences for other worker populations, the authors follow the best practices in scale development as proposed by Benson (1998). Benson (1998) describes scale development as an ongoing process, and the current study contributes to this process by expanding the nomological network of mastery-avoidance by following Benson’s (1998) three steps: the substantive, structural, and external phases of scale development, which the authors describe below.

Substantive Stage

VandeWalle (1997) developed items to reflect theoretical achievement goals proposed by Dweck and Leggett (1988) and Elliot (Elliot and Harackiewicz, 1996). Specifically, mastery goals are defined as “the desire to develop the self by acquiring new skills, mastering new situations, and improving one’s competence,” performance-approach goals as “the desire to prove one’s competence and to gain favorable judgments about it,” and performance-avoidance goals as “the desire to avoid the disproving of one’s competence and to avoid negative judgments about it” (VandeWalle, 1997: 1000). Baranik et al. (2007) supported a six-item scale for mastery-avoidance based on the definition of mastery-avoidance as “a focus on avoiding self-referential or task-referential incompetence” (Elliot, 2005: 61). During the initial study of the mastery-avoidance scale participants found the negative phrasing of two mastery-avoidance items problematic and the same two items have the lowest factor loadings. Thus, the final AGW instrument is a four-scale measure with four items for each subscale (see Table 1).

Structural Stage

Baranik et al. (2007) show that a four-factor model fit the items well, and that alternative three- and two-factor models of the AGW fit significantly worse. Even with this positive validity evidence, Baranik et al.’s (2007) use of data from full-time college
students who were responding about various part-time and temporary jobs presents challenges to affirming the structural integrity of the AGW. This data is acceptable for initial scale development, but is insufficient for general research because the initial sample was not representative of the older, full-time employee populations the scale will be used to assess. The psychometric properties observed using one population may not generalize to other populations (American Educational Research Association, American Psychological Association, National Council on Measurement in Education, 1999). Therefore, a CFA study of the AGW using a sample of older, full-time workers is essential for using the AGW scores for workplace research and practice.

Table 1

Items in the 2 x 2 Measure of Achievement Goals

<table>
<thead>
<tr>
<th>The 2 x 2 Measure of Achievement Goals in a Work Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP1 – I am willing to select a challenging work assignment that I can learn a lot from.</td>
</tr>
<tr>
<td>MAP2 – For me, development of my work ability is important enough to take risks.</td>
</tr>
<tr>
<td>MAP3 – I often look for opportunities to develop new skills and knowledge.</td>
</tr>
<tr>
<td>MAP4 – I enjoy challenging and difficult tasks at work where I'll learn new skills.</td>
</tr>
<tr>
<td>PAP1 – I like to show that I can perform better than my coworkers.</td>
</tr>
<tr>
<td>PAP2 – I prefer to work on projects where I can prove my ability to others.</td>
</tr>
<tr>
<td>PAP3 – I try to figure out what it takes to prove my ability to others at work.</td>
</tr>
<tr>
<td>PAP4 – I enjoy it when others at work are aware of how well I am doing.</td>
</tr>
<tr>
<td>PAV1 – I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.</td>
</tr>
<tr>
<td>PAV2 – Avoiding a show of low ability is more important to me than learning a new skill.</td>
</tr>
<tr>
<td>PAV3 – I prefer to avoid situations at work where I might perform poorly.</td>
</tr>
<tr>
<td>PAV4 – I'm concerned about taking on a task at work if my performance would reveal that I had low ability.</td>
</tr>
<tr>
<td>MAV1 – I just try to avoid being incompetent at performing the skills and tasks necessary for my job.</td>
</tr>
<tr>
<td>MAV2 – My goal is to avoid being incompetent at performing the skills and tasks necessary for my job.</td>
</tr>
<tr>
<td>MAV3 – I just hope I am able to maintain enough skills so I am competent at my job.</td>
</tr>
<tr>
<td>MAV4 – At work, I am just trying to avoid performing the tasks required for my job poorly.</td>
</tr>
</tbody>
</table>

Note. MAP = Mastery-Approach, PAP = Performance-Approach, PAV = Performance-Avoidance, MAV = Mastery-Avoidance
Heckhausen and Schulz’s (1995; Heckhausen, 2005) work on motivation across the lifespan furthers concerns. As part of their Lifespan Theory of Control, they predict that early-career workers adopt more achievement goals than mid-late career workers. College-aged employees are highly challenged by their jobs and may think about a broad range of skills and tasks that they are developing, including job socialization, basic interpersonal and communication skills, and social norm adjustment. In contrast, older employees may not be as focused on mastering these basic skills. Thus, workers in various career stages may be thinking of different components of the job when they respond to the AGW items, which may lead to different psychometric properties.

External Stage

Baranik et al. (2007) provide some initial discriminant validity evidence for the newly developed mastery-avoidance scale; however, additional external validity evidence is needed for a full-time working population. If the mastery-avoidance scale is measuring what it is supposed to in the workplace, mastery-avoidance and mastery-approach scores will be related yet distinct. Furthermore, mastery-avoidance and performance-approach will be related as observed previously in other contexts (Elliot and McGregor, 2001; VandeWalle, 1997). Baranik et al. (2007) examine the association between mastery-avoidance and motive to avoid failure in the workplace, a construct that notably also focuses on self-referents. Mastery-avoidance is theoretically distinguished from performance-avoidance by using a self-referent rather than an other-referent.

Thus, mastery-avoidance at work should correlate positively with motive to avoid failure at work (Conroy and Elliot, 2004; Elliot and McGregor, 2001).

Perhaps the most important type of external validity evidence for the mastery-avoidance scale is associations with key performance variables in the workplace, namely job performance and feedback-seeking. One would expect mastery-avoidance scores to be positively correlated with feedback-seeking (VandeWalle, 2003; VandeWalle and Cummings, 1997). Individuals high on mastery-avoidance may need to rely on the feedback of others to get by. Furthermore, because individuals who are mastery-oriented are not focused on how they compare to other individuals, they will not hesitate to ask others for help as much as performance-oriented individuals might. In contrast, mastery-avoidance should be negatively correlated with job performance in the workplace (Baranik et al., 2010; Van Yperen et al., 2009). Van Yperen (2003) proposes that mastery-avoidance may lead to more negative outcomes than performance-avoidance, which is typically considered the most maladaptive achievement goal, because there is less room to “attribute one’s failure to the ambiguity of, or a misfit with, the norm group…or to the nature of the task” (Van Yperen, 2003: 1013). The current study uses a full-time working sample of employees to examine workplace behavior and mastery-avoidance, a notable contribution as few studies on mastery-avoidance have used samples of full-time employees.
The authors conducted two studies in the current investigation. The first study extends support for the four-factor structure by examining the measurement invariance of the instrument across full-time older employees and the student employees studied by Baranik et al. (2007). If measurement invariance is supported between the college student sample and an older worker population, the authors can also test Heckhausen’s (2005) lifespan theory of control using the latent means. The primary purpose of the second study is to build the nomological network of evidence for mastery-avoidance scores from the AGW. To this end, the authors examined correlations of mastery-avoidance scores with the other achievement goals, motive-to-avoid failure, feedback-seeking, and job performance.

**STUDY 1 METHOD**

Participants and Procedure

The student sample in this study consists of 627 introductory psychology students at a mid-sized southeastern university. The mean age was 19.0 years, 88% of participants were white, and 67.4% were female. Only students who had held jobs or currently held jobs were asked to participate. The employee sample in this study was composed of 164 administrative and professional non-teaching, full-time employees at a mid-sized southeastern university. Thirty-one percent of the participants identified themselves as being in a managerial position, and fifty percent identified themselves as being in hourly or salaried positions. Over 50% of the sample was between the ages of 30 to 40 years old, 90.2% of participants were white, and 81.1% were female. Both groups completed an online survey.

Measures

The 16 items in the AGW are presented in Table 1. Four items on the instrument assess each achievement goal. Participants responded to each item using a seven-point response scale that ranges from 1 (Strongly Disagree) to 7 (Strongly Agree).

**STUDY 1 RESULTS**

Testing Measurement Invariance

The authors used LISREL version 8.54 to test measurement invariance and followed the sequence of tests for the confirmatory factor analysis (CFA) approach to testing measurement equivalence because it is a rigorous test of the generalizability of the psychometric properties of a scale (Vandenbergh and Lance, 2000). Measurement invariance tests the extent to which the measurement properties of the items measured are generalizable across populations. The first configural invariance step tests whether the college sample and employee sample both yield four-factor CFA solutions. This step tests whether the general construct is the same across populations. The second
metric invariance step tests whether the two groups show similar factor loadings when compared. For example, metric invariance tests whether a response of “3” has the same meaning across populations. The third scalar invariance step compares the items’ intercepts from their regressions on corresponding latent variables. This step tests for mean differences between groups. Finally, uniqueness invariance tests the similarity of the error terms across the two groups. This step tests the reliability of items across groups.

**Configural Invariance.** Model fit indices are shown in Table 2. Although the omnibus test of the equality of covariance matrices was rejected on the basis of the $\chi^2$ statistic, the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean squared error or approximation (RMSEA) all indicated acceptable model fit (Hu and Bentler, 1998). As such, the omnibus test indicated that, practically speaking, the students’ and employees’ responses to the achievement goal items were quite comparable. Single-sample CFAs indicated that a four-factor model fits well in both the student sample ($\chi^2 (98) = 246.58, p < 0.01; \text{CFI} = 0.97, \text{TLI} = 0.97, \text{RMSEA} = 0.049, \text{SRMSR} = 0.045$) and in the employee sample ($\chi^2 (98) = 160.82, p < 0.01; \text{CFI} = 0.96, \text{TLI} = 0.95, \text{RMSEA} = 0.058, \text{SRMSR} = 0.068$). As shown in Table 3, the multi-sample test of configural invariance emphasizes further that a four-factor solution was a well-fitting model for both samples.

**Metric Invariance.** The metric invariance model imposes the additional restrictions of equal factor loadings on the configural invariance model. Although the difference in overall $\chi^2$s for the configural and metric invariance models is statistically significant (Models 3 vs. 2 in Table 3), none of the factor loadings individually are statistically significantly different across samples. This, combined with the fact that the models’ overall fit indices remain essentially unchanged with the increased restrictions (Cheung and Rensvold, 1999), supports the idea that workers and students respond in similar ways to reflect their conceptions of achievement goals.

**Scalar Invariance.** The scalar invariance model imposes additional restrictions on the metric invariance model that items’ intercepts from their regressions on corresponding latent variables are equal across samples. As in the test for metric invariance, the $\chi^2$ test was statistically significant (Models 4 vs. 3 in Table 3), but none of the intercepts are significantly different across samples and, again, the scalar invariance model’s overall fit indices remained essentially unchanged. Combined, these results indicate that there are little or no differential leniency or severity response biases in the employee and student responses.

**Uniqueness Invariance.** Finally, the test for invariant uniquenesses results in a significant $\chi^2$ and levels of decreases in model CFI and TLI that Cheung and Rensvold (1999) suggest are indicative of reduced model fit. Indeed, 11 out of 16 uniquenesses are significantly different across samples, but there is no discernible pattern of differences (e.g., six of the employees’ uniquenesses were significantly larger than students’ and five of the students’ uniquenesses were larger than employees’). As such, the authors selected the scalar invariance model as the best-fitting model to the data and concluded that the AGW is sufficiently invariant across the student and employee samples. Thus, the authors present and interpret the model parameters for the scalar equivalent model.
### Table 2

**Study 1: Tests of Measurement Equivalence for the 2 x 2 Measure of Achievement Goals**

<table>
<thead>
<tr>
<th>Model</th>
<th>df</th>
<th>$\chi^2$</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
<th>SRMSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Omnibus Test</td>
<td>136</td>
<td>311.42*</td>
<td>0.98</td>
<td>0.96</td>
<td>0.051</td>
<td>0.140</td>
</tr>
<tr>
<td>2. Configural Invariance</td>
<td>196</td>
<td>407.40*</td>
<td>0.97</td>
<td>0.96</td>
<td>0.051</td>
<td>0.068</td>
</tr>
<tr>
<td>3 vs. 2</td>
<td>12</td>
<td>26.96*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Metric Invariance</td>
<td>208</td>
<td>420.18*</td>
<td>0.97</td>
<td>0.96</td>
<td>0.051</td>
<td>0.074</td>
</tr>
<tr>
<td>4 vs. 3</td>
<td>12</td>
<td>53.98*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Scalar Invariance</td>
<td>220</td>
<td>468.50*</td>
<td>0.97</td>
<td>0.96</td>
<td>0.052</td>
<td>0.076</td>
</tr>
<tr>
<td>5 vs. 4</td>
<td>16</td>
<td>79.64*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Invariant Uniquenesses</td>
<td>236</td>
<td>597.14*</td>
<td>0.95</td>
<td>0.95</td>
<td>0.060</td>
<td>0.092</td>
</tr>
</tbody>
</table>

* $p < 0.01$
Table 3
Study 1: Completely Standardized CFA Model Estimates with Metric and Scalar Invariance Constraints Invoked

<table>
<thead>
<tr>
<th>Variables</th>
<th>Intercepts</th>
<th>Mastery Approach</th>
<th>Performance Approach</th>
<th>Performance Avoidance</th>
<th>Mastery Avoidance</th>
<th>Uniqueness-Students</th>
<th>Uniqueness-Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP1</td>
<td>0.00</td>
<td>0.66*</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.34*</td>
<td>0.69*</td>
</tr>
<tr>
<td>MAP2</td>
<td>-0.53</td>
<td>0.67*</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.33*</td>
<td>0.69*</td>
</tr>
<tr>
<td>MAP3</td>
<td>-0.54</td>
<td>0.78*</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.40*</td>
<td>0.33*</td>
</tr>
<tr>
<td>MAP4</td>
<td>-2.54*</td>
<td>0.84*</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.31*</td>
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</table>

* p < 0.01
Interpreting Model Parameters

Estimates from the scalar invariance model are shown in the top panel of Table 3. Note that only one solution is shown for items’ intercepts and factor loadings as these were constrained to be equal across samples. Separate estimates are provided for items’ uniquenesses as these were found to be non-invariant. Note also that the statistical significance of freely estimated intercept terms indicates only whether their values differ significantly from the referent indicator’s fixed value of 0.0, and LISREL’s completely standardized factor loadings and uniquenesses are shown in order to facilitate relative comparisons.

**Factor Loadings.** With one exception (PAP4’s loading on the Performance Approach factor), the items’ factor loadings are uniformly large and statistically significant.

**Score Reliability.** Coefficients alpha for the four subscales were: (a) mastery-approach = 0.82 students, 0.78 employees; (b) mastery-avoidance = 0.82 students, 0.83 employees; (c) performance-approach = 0.69 students, 0.69 employees; and (d) performance-avoidance = 0.78 students, 0.80 employees.

**Factor Covariances.** Table 4 shows the estimated latent factor means and correlations for the student sample and the employee sample. The latent correlations among VandeWalle’s (1997) scales and mastery-avoidance scale scores provide evidence of the newer scale’s scores. As expected, performance-avoidance and mastery-avoidance are related yet distinct for the student and employee samples (r = 0.68, 0.73). Like previous researchers, the authors found that mastery-avoidance correlates positively with performance-approach (e.g., Elliot and McGregor, 2001; VandeWalle, 1997). Finally, mastery-avoidance is negatively correlated with mastery-approach in the student sample (r = -0.44), but not in the employee sample.

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Study 1: Factor Correlations and Latent Means for the 2 x 2 Model of Achievement Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery-Approach</td>
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<tr>
<td>Performance-Approach</td>
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<tr>
<td>Performance-Avoidance</td>
<td>-0.46*/-0.38*</td>
</tr>
<tr>
<td>Mastery-Avoidance</td>
<td>-0.44*/-0.06</td>
</tr>
<tr>
<td>Latent Means</td>
<td></td>
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<tr>
<td>Students</td>
<td>5.65*</td>
</tr>
<tr>
<td>Employees</td>
<td>6.22*</td>
</tr>
</tbody>
</table>

Note. * p < 0.01.Correlations for the student sample are presented first and correlates for the employee sample are presented second.
**Latent Means.** Given that the authors found adequate measurement invariance across students and full-time workers, the authors were able to test Heckhausen and Schulz’s (1995) lifespan theory of control by examining the latent means on the achievement goal scales for each group. Compared to the employee sample, the student sample has a statistically significant higher mean for the mastery-avoidance, performance-approach, and performance-avoidance goals. However, Heckhausen and Schultz’s (1995) prediction is not entirely supported since the student sample endorses mastery-approach less than the older workers.

**STUDY 2 METHOD**

Because Study 1 showed support for the psychometric properties of the AGW, it was appropriate to examine the convergent and discriminant validity in Study 2.

**Participants and Procedure**

The sample consists of 72 employees of a large manufacturing company located in the Southeast. Sixty-four percent are female and ninety percent are white. Sixty-nine percent are between the ages of 25 to 39. For individuals within the sample, 87% of the employees work 35 to 55 hours per week, 64% are hourly workers (e.g., maintenance technicians), and 63% are employed by the organization for 10 to 20 years. This sample differs from the sample used in Study 1 in that the variety of type of jobs found in Study 2 are more variable (i.e., managerial, maintenance, administrative, and clerical positions were examined) than the jobs in Study 1, which focus primarily on administrative positions. The authors recruited participants via an email sent by a human resources employee and used an online survey.

**Measures**

**Achievement Goals.** The AGW scale was administered in identical form to Study 1. Coefficients alpha obtained from the Study 2 sample were: Mastery-approach = 0.72, Mastery-avoidance = 0.73, Performance-approach = 0.76, and Performance-avoidance = 0.74.

**Motive to Avoid Failure.** The authors administered the six-item version of Hagtvet and Benson’s (1997) Motive to Avoid Failure (MAF) scale. Respondents rated each item using a four-point scale, ranging from 1 (Almost Never) to 4 (Almost Always). The coefficient alpha obtained is 0.88. An example item is “I dislike work that I’m not sure I can manage.”

**Feedback-Seeking.** Feedback-seeking behavior is measured with an item used by VandeWalle and Cummings (1997). The item asks “How frequently do you seek information from your co-workers about your work performance?” Participants respond using a 1 (Very Infrequently) to 7 (Very Frequently) response scale.

**Job Performance.** The authors measure performance using a single item asking participants “How did your supervisor rate your overall job performance on your last performance review?” Participants respond to the question using a 1 (Very Poor) to 7 (Very Good) response scale.
STUDY 2 RESULTS

Means and intercorrelations for the four goal scale scores are shown in Table 5. Similar to the Study 1 samples, the mean of mastery-avoidance is greater than the mean of performance-avoidance, but less than the means of mastery-approach and performance-approach, showing that mastery-avoidance is the third most salient achievement goal. Correlations are similar to the Study 1 results in that mastery-avoidance was related, yet distinct from performance-avoidance ($r = 0.44$) as was performance-approach ($r = 0.38$). Similar to the older workers in Study 1, there is a null relationship between mastery-avoidance and mastery-approach, whereas there is a negative correlation between the two goals for the student workers in Study 1.

First, the authors find a positive correlation between the motive to avoid failure and mastery-avoidance ($r = 0.27$). This finding provides convergent validity evidence for the mastery-avoidance scores because theorists have suggested that the motive to avoid failure is an antecedent of mastery-avoidance achievement goals (Conroy and Elliot, 2004). Second, the authors find that mastery-avoidance was positively related to feedback-seeking from coworkers ($r = 0.24$). This finding is consistent with theoretical expectations for mastery-avoidance scores, as these individuals may need to reach out to others for help since they are trying to master the basics of a job. Finally, the authors find that mastery-avoidance was negatively correlated with job performance ($r = -0.15$). Although this correlation was not statistically significant, it is much greater than the relationship between job performance and performance-avoidance, and thus the authors consider it positive support for the validity of the mastery-avoidance scores.

Table 5

<table>
<thead>
<tr>
<th></th>
<th>MAP</th>
<th>PAP</th>
<th>PAV</th>
<th>MAV</th>
<th>MAF</th>
<th>FB</th>
<th>PERF</th>
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<td>0.48</td>
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</table>

*Note.* *p < 0.01. MAP = mastery-approach; PAP = performance-approach; PAV = performance-avoidance; MAV = mastery-avoidance; MAF = motive to avoid failure; FB = feedback from coworkers; PERF = job performance.
GENERAL DISCUSSION

Study 1 results contribute valuable validity evidence for the AGW, a four-factor measure of achievement goals in the work domain, by establishing measurement invariance across full-time adult and part-time college student employee populations. Study 2 results contribute additional external validity evidence for the newly developed mastery-avoidance scale’s scores by demonstrating that scores from the mastery-avoidance scale relate in expected ways with the other achievement goals, motive-to-avoid failure, feedback-seeking, and job performance.

IMPLICATIONS OF THE RESULTS

The authors consider the results evidence that mastery-avoidance is salient in the workplace. Both part-time and full-time workers endorsed mastery-avoidance goals more often than they endorsed performance-avoidance goals. Furthermore, the four-factor structure of the achievement goal instrument supports the notion that mastery-avoidance is empirically distinct enough to consider using a separate measure. The authors find that mastery-avoidance had a stronger, negative relationship to job performance than performance-avoidance, supporting Van Yperen (2003) who posited that mastery-avoidance achievement goals might be even more deleterious than performance-avoidance. Given that mastery-avoidance appears to be operating in at least some work settings, the authors endorse using a four-factor theoretical model of achievement goals at work.

The authors find that older employees endorsed mastery-avoidance, performance-approach, and performance-avoidance goals less than younger employees. This finding supports the theory of control (Heckhausen, 2005); however, mastery-approach achievement goals did not follow the expected pattern in that older workers endorsed mastery-approach more. The authors propose several possible explanations for this discrepancy. It may be that employees are able to gravitate towards jobs they find more interesting across their careers (Harackiewicz et al., 2008), that individuals may develop more adaptive goals as they mature (Loevinger, 1976), or that a selection bias occurs, such that employees with adaptive achievement goals are more likely to be selected and retained in full-time positions.

LIMITATIONS AND FUTURE RESEARCH

One limitation of this study is the use of self-report and single-item measures of job performance. Some readers may have concerns associated with the use of this type of measure for complex constructs. The authors acknowledge that common method variance associated with using self-report measures could have artificially inflated the correlations between the measures, and single-item indicators have weaker reliability and validity than multiple-item measures. Still, the authors consider the results from this study useful as long as the limitations of the measures are considered. Single-item measures can be highly correlated with full-scale measures (Wanous et al., 1997), and the single-item measures used did correlate with the other variables in expected ways.
A second limitation of Study 2 was the relatively small sample size. Results from studies with small sample sizes are more likely to be idiosyncratic and lack power to detect statistical significance. Future research must look at the relationships that were tested in the current study with more expansive measures and larger sample sizes to establish the reliability of the findings, in addition to examining more variables to expand construct validity evidence. Finally, the authors found low reliability estimates for one of the AGW scales, performance-approach. Low reliability indicates a high degree of error and instability in measurement, which could lead to underestimation of the relationships between AGW and other variables.

CONCLUDING REMARKS

Given mounting evidence that employees do adopt mastery-avoidance goals, and that mastery-avoidance goals negatively influence performances in work settings, the authors believe organizations should consider ways to prevent workers from adopting mastery-avoidance goals. Placing employees in positions that match their skills and abilities may minimize the endorsement of mastery-avoidance goals. Situations that force employees to move into positions which are beyond their perceived competencies should be entered into cautiously, considering that while for some employees transitioning into a more challenging role within the organization may be invigorating, it may cause others to adopt deleterious mastery-avoidance goals. As a general rule, employees, supervisors, and human resource managers should work together to tailor employees’ performance expectations such that the employee is optimally challenged, but not struggling to meet basic expectations of the job. To this end, the authors believe the AGW is a valuable research tool for monitoring and studying achievement goals in the workplace, and invite researchers to continue to build the validity evidence for the scores.

References


Social Capital as a Conduit for Alliance Portfolio Diversity

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Assistant Professor
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Social capital refers to the resources originated from social relationships (Payne et al., 2011). More specifically, social capital is a product of relationships that have developed through interactions and networks of relationships, both personal and firm-level (Adler and Kwon, 2002; Stevenson and Radin, 2009). Social capital exists within relationships that are both internal and external to a firm. External social capital, which exists in the context of inter-organizational relationships, can be thought of as a combination of a firm’s relationships and the resources available to the firm as a result of its relationships with other companies. Research has shown repeatedly that external social capital plays an important role in firm-level outcomes including firm performance (Bell, 2005; Florin et al., 2003), innovation (Tsai, 2001), and a firm’s ability to attract necessary resources (Florin et al., 2003).

Seeking to extend earlier research regarding the potential benefits of social capital, this study examines the influence of social capital on the diversity found within a firm’s alliance portfolio. It is first argued that the social networks of key executives are important in creating diverse alliance portfolios, followed by the argument that a firm’s social capital characteristics should affect the diversity of its alliance portfolio partnerships. This study is among the first to empirically examine the role of these social capital relationships on alliance portfolio diversity. Although some studies have adopted a fairly comprehensive view of social capital in which a multilevel perspective is implied, researchers have yet to fully adopt the perspective that social capital is a multilevel construct (Payne et al., 2011). This study’s multilevel approach is beneficial in understanding more fully social capital’s impact on managerial phenomena (Payne et al., 2011).

In the alliance literature, alliance portfolio diversity has become a construct of interest as researchers have begun to pay more attention to the effects of alliance portfolios rather than just alliance dyads. Many of these studies have examined how diversity within an alliance portfolio affects outcomes such as firm performance and
innovation (e.g., Goerzen and Beamish, 2005; Sampson, 2005; Sampson, 2007). Rather than examine how alliance portfolio diversity affects performance, this study seeks to further understand multiple levels of antecedents to a firm’s alliance portfolio diversity (Cui and O’Connor, 2012). This is a contribution to the literature as prior studies have largely examined firm-level portfolio network characteristics as antecedents of alliance portfolio diversity (e.g., Goerzen and Beamish, 2005; McGill and Santoro, 2009) and failed to approach alliance portfolios from multiple levels of analysis (Cui and O’Connor, 2012).

SOCIAL CAPITAL ANTECEDENTS OF ALLIANCE PORTFOLIO DIVERSITY

Social Capital

Social capital is a widely used term that reflects the outcomes and effects of a social network and its members (Adler and Kwon, 2002; Lin, 2001). It has been defined as “the sum of the actual and potential resources embedded within, available through, and derived from the networks possessed by an individual or social unit, and social capital thus comprises both the network and the assets that may be mobilized through that network” (Nahapiet and Ghoshal, 1998: 243). Recently, social capital research, along with network development research, has been classified as existing at both the interpersonal level and interorganizational level (Carpenter et al., 2012).

At the interpersonal level, studies focus on the individual actors while interorganizational level research pays attention to organizations formed by multiple individual members whether firms, teams, or subunits. This classification was offered to ease the complexity derived from multiple scholars’ specific research questions. As a result, social capital has been characterized as falling into four major categories: “(1) social capital research at the interpersonal level, (2) social capital research at the interorganizational level, (3) network development research at the interpersonal level, and (4) network development research at the inter-organizational level” (Carpenter et al., 2012: 1330).

At the individual level, social capital is a source of: career development (Burt, 1997), power and influence (Sparrowe and Liden, 1997), and improved performance (Mehra et al., 2001). At the organizational level, social capital benefits have been linked to reducing transaction costs (Gulati, 1995), improving access to resources (Shane and Cable, 2002), and increasing the likelihood of adopting innovative approaches (Shipilov, 2009). Furthermore, research in social capital has identified embeddedness, the contextual effects of social ties and networks on members’ actions (Granovetter, 1985), as the fundamental mechanism that allows individuals and firms to receive all the benefits derived from social capital as well as to continue to produce additional social capital value (Moran, 2005).

Regarding social capital research focused on network development at the interpersonal and interorganizational level, researchers have concluded that social networks can be studied based on the effects they cause. The first approach takes an external view, called network application, in which networks are operationalized mostly as channels of resource flows (Lin, 2001). The second approach takes an internal view, called network structure, where the influence of networks comes from
the ways in which participants are connected (Burt, 1997). Moreover, this logic of an external and internal view represents two sources of social capital: resources inhering in social ties and patterns of members’ connectedness in networks (Adler and Kwon, 2002). However, regardless of the view adopted, social capital research studies the implications of networks and thus uses network constructs as predictors (Adler and Kwon, 2002).

In addition to the classification provided by Carpenter et al. (2012), Payne et al. (2011) assessed and classified social capital as well. However, this latter study focused on two categorical dimensions, unit of analysis (individual or organizations) and locus of activity that highlighted multilevel issues that are intrinsic in social relationships. The intersection of these two dimensions generated four quadrants regarding social capital research: social capital of individuals with internal ties (individual/internal), social capital of collectives with internal ties (collective/internal), social capital of individuals with external ties (individual/external), and social capital of collectives with external ties (collective/external) (Payne et al., 2011). Overall, the authors concluded that social capital is a multilevel construct because it consciously addresses the nesting of organizational entities and thus it offers great potential to uncover managerial and organizational issues at different levels. The authors also point out that adopting a multilevel approach can also clarify and eventually ease the problems associated with definitions and operationalization of social capital (Payne et al., 2011).

**Alliance Portfolio Diversity**

Alliance portfolio diversity pertains to the heterogeneity of knowledge and resources represented across the portfolio of partnerships. Partner selection is driven in large part due to a desire to access a variety of resources and knowledge that will help to achieve the alliance success. Alliance portfolios can then significantly vary in diversity (Jiang et al., 2010; Vasudeva and Anand, 2012). Investigating portfolios of alliances enables analysis of very different phenomena than when observed as an individual phenomenon based on a partner’s technological capability (Anand et al., 2007; Vassolo et al., 2004). When the partners’ technological approaches overlap, new ideas and knowledge are not being generated, instead alliance partners find a redundant theme of skills sets, ideas, and knowledge that leads to a weakened alliance portfolio (Anand et al., 2007).

Alliance portfolio diversity has been defined as the extent of variance in a focal firm’s alliance partners, functional scopes, and authority or governance structures (Jiang et al., 2010). The literature has identified that alliance success has been found to be shaped by multiple forms of diversity including: partner selection, functional purpose of alliance, governance structures, technology platforms, and industry scope. Ultimately, balancing numerous forms of diversity (partner selection, functional purpose, governance, technological platform and industry scope) is most likely to aid firms in achieving alliance success. This study specifically focuses on industry-related variations as the outcome of interest (i.e., alliance portfolio diversity). Specifically, prior research suggests that in order to achieve a strategic balance in new and old partnerships firms involved should pursue partnerships across industries (Kruss, 2008). Industry-related diversity also has been highlighted in prior research as a
critical way to achieve technology transfer (Chunhua et al., 2011) and as a primary mechanism for successful new market entry (Hirt et al., 2013).

Among other benefits, portfolios of alliances with other firms have a significant impact in a firm’s innovation (Sampson, 2007). In addition, being involved with several alliances under a coordinated portfolio approach has been argued to provide value beyond that of individual alliances (Anand et al., 2007) leading thus to the recommendation that a portfolio view is preferred when investigating alliances. Focusing only on individual alliances can lead to research inefficiencies because researchers fail to recognize important interdependencies across firms (Jiang et al., 2010).

Furthermore, alliance portfolio diversity has also been identified as an important construct when addressing the role of partnerships in firms’ innovation (Cui and O’Connor, 2012). Initially, firms need to recognize that coordination among firms’ alliances is required. This will allow firms to access the synergies among the partners’ resources that could be potentially generated and be able to administer the information and resource flows regardless of organizational boundaries (Hoffmann, 2005). Innovation is further supported when inter-firm collaboration occurs within a diverse portfolio of alliances (Cui and O’Connor, 2012; Sampson, 2005).

**HYPOTHESES DEVELOPMENT**

**Top Management Teams’ Social Capital**

In addition to their own experience, skills, and knowledge, executives possess varying levels of social capital derived from their personal portfolio of connections especially those at top management team (TMT) levels. One of the most visible forms of executive-level social capital involves executives’ board of director memberships (Gulati and Westphal, 1999; Mizruchi, 1996). While board directorships confer individual-level social capital to the executives involved that can be used for their personal benefit, a firm can also benefit from the social capital that its top management team develops while serving as outside directors on the boards of other firms. One such benefit is that board ties provide access to knowledge, strategic information, and opportunities (Pfeffer, 1991). Directors are generally expected to provide strategic advice and oversight of management. In fulfilling these roles, board members interact with each other and with employees and other stakeholders (e.g., suppliers, customers, and partners) of the firm on whose boards they serve. This outside board involvement by a firm’s TMT provides direct benefits to the firm by, for example, enhancing the formulation and implementation of significant strategic decisions by the firm (such as acquisitions, alliance formations, and divestitures) and improving the quality of decision-making by the firm’s executives (Miller et al., 1998). It is important to note though that the benefits derived from board membership are not one-sided. While TMT members add value to a firm on whose board they serve, they also expand their portfolios of connections and gain valuable knowledge that is useful to their firms (Kor and Sundaramurthy, 2009). It has been established in the literature that executives’ external connections are an important source of information and that the information gained from these connections can influence firm decision-
making and performance (Eisenhardt and Schoonhoven, 1996; Geletkanycz and Hambrick, 1997). With board connections, information gained should be high quality and timely. When a focal firm’s TMT members sit on a variety of boards, their collective experience, relationships, and information bases will help the focal firm to recognize and take advantage of new opportunities (Useem, 1984). Board membership can speed the acquisition of information residing outside of the firm’s boundaries. External executive connections can also become conduits for acquiring critical resources that may not otherwise be available to a firm (Pfeffer and Salancik, 1978; Kim, 2007). Thus, the extent to which TMT members are connected to outside firms allows a firm to use these connections to access resources including information and knowledge, and facilitate the formation of connections to an even greater variety of partners.

Second, board connections convey legitimacy and status. When a member of a focal firm’s TMT becomes a director at another firm, this signals both the quality of the individual and of the firm that employs him/her (Spence, 1974). Especially for larger firms such as those in the S&P 500, directors gain higher status as a result of their appointment (Westphal and Stern, 2007) and outsiders usually assume that outside directors have been carefully vetted and are, therefore, of high quality. As a result, a firm with TMT members who hold outside board memberships becomes more attractive to stakeholders including potential alliance partners. As the number of board connections increase, the number of potential partners that see the firm as legitimate and attractive will expand, opening doors for the individual and for the individual’s focal firm that would otherwise not be available (Mizruchi, 1996) and increasing the pool and diversity of firms that are willing to become partners (Eisenhardt and Schoonhoven, 1996).

Finally, board membership helps to resolve uncertainty, making it more likely that a firm will enter into alliances with organizations that are less like the firm (that is, more diverse) (Gulati and Westphal, 1999). The longer a TMT member is on a board, the greater the internal social capital that he/she is able to develop (Fischer and Pollock, 2004). This greater understanding and knowledge of fellow directors and other stakeholders of the board’s firm has been shown to positively affect board functioning and dynamics (Fischer and Pollock, 2004; Westphal and Bednar, 2005). Likewise, it is expected that this strengthening of board connections will also facilitate an understanding of what potential partners can offer to the focal firm making the focal firm more comfortable forming relationships with partners that are more diverse.

Prior studies have shown that social capital connections created through board membership are not universally positive (Gulati and Westphal, 1999). For example, some connections are positive and characterized by trust while others may be negative and characterized by mistrust. The characteristics of individual connections or the dynamics within a board then can influence the likelihood that any one connection leads to the formation of an alliance (Gulati and Westphal, 1999). However, because of the concern of the aggregate effect of the TMT social capital, it is suggested that the likelihood of healthy, positive relationships that will expose a firm to more diverse potential partners increases as the total number of social capital connections and the strength of social capital connections increase.
In sum, this study focuses on TMT social capital as an aggregate construct that encompasses the relationships that members of a firm’s top management team members have because of their various board affiliations. As the number of social capital connections held by a TMT increases, it is expected that connections to a greater variety of potential partners will be formed and that the TMT’s ability to recognize the potential benefits of such diverse partners will be enhanced. And, as the strength of TMT social capital connections increases, the reliability of information made available via such social capital connections is expected to increase and greater information will be exchanged (Reagans and McEvily, 2003). Furthermore, TMT members (and the focal firm, by extension) will be more trusted, increasing the likelihood of successfully negotiating with potential partners; the more different the partners, the more important the role of social capital in providing information and legitimacy.

Therefore, the following hypotheses are proposed:

**Hypothesis 1:** The number of external social capital connections held by a firm’s TMT is positively related to the firm’s alliance portfolio diversity.

**Hypothesis 2:** The strength of external social capital connections held by a firm’s TMT is positively related to the firm’s alliance portfolio diversity.

**Firm-Level Social Capital**

Strategic alliances involve any voluntarily initiated agreement between firms in which they cooperate in sharing, exchanging, or jointly-developing resources (Gulati, 1995; Gulati and Singh, 1998). Alliances can be effective vehicles for accessing or acquiring resources and knowledge that the focal firm lacks (Collins and Hitt, 2006; Eisenhardt and Schoonhoven, 1996) and have been shown to enhance firm innovation (Hoffmann, 2005) and performance (Bell, 2005; Goerzen and Beamish, 2005). While social capital derived from each unique alliance can serve as the basis for the subsequent formation of new alliances, becoming embedded in a network of alliances is expected to confer additional social capital benefits. When a firm is highly embedded in a network it tends to have recurring interactions with other network firms thus expanding the firm’s portfolio. Potential partners may be attracted to a firm not only because of its firm-specific resources, but because of its portfolio of alliance relationships, which can provide access to the resources of firms outside the central firm’s portfolio. Being embedded within a network also creates familiarity and trust between network firms and can increase the quality of information that is exchanged between partners (Uzzi, 1996) which can further influence the attractiveness of network firms.

As the number of partners in a firm’s alliance portfolio increases, the diversity of its portfolio is also expected to increase. In part, this is simply because while some partners may be very similar, with a greater number of partners the dissimilarity is expected to increase. However, as a firm enters into a greater number of alliances, it is
also expected to become more familiar with other potential partners and to be more comfortable forming and managing alliances. As alliance experience increases, a firm’s alliance management capabilities are developed (Anand and Khanna, 2000). With these greater capabilities and comfort, a firm can be expected to feel more at ease entering into alliance with more dissimilar partners. Furthermore, having a larger number of direct exchange partners tends to provide greater amounts of information and resources (Uzzi, 1996). Thus, a firm with a larger number of alliances is likely to be an attractive partner.

Similarly, it is reasonable to expect that diversity will increase as the average strength of connections within its alliance portfolio increases. Strong connections, which are marked by close and frequent interaction, promote in-depth understanding of partners and facilitate the sharing of information as well as the development of shared norms and routines (Walker et al., 1997). As portfolio partners engage in repeated interactions, they tend to behave less opportunistically because of greater trust that develops and because of the sanctions that other partnering firms can impose for such behavior (Uzzi, 1996). As a firm develops stronger connections in its existing alliance portfolio, this sends a signal to other potential partners that the firm can be trusted. These signals are particularly critical to potential partners that represent firms that are dissimilar to the focal firm. Because of their dissimilarity, such a potential partner may be less likely to understand, to interact with, and to trust the focal firm. In such situations, potential partners are likely to look more favorably on firms with strong connections to its portfolio of partners and be more likely to enter into alliances with them. Therefore, the following hypotheses are proposed:

**Hypothesis 3:** The number of external social capital connections held by a firm is positively related to the firm’s alliance portfolio diversity.

**Hypothesis 4:** The strength of external social capital connections held by a firm is positively related to the firm’s alliance portfolio diversity.

**METHODOLOGY**

**Sample**

The sample for this study is a panel dataset comprised of 300 randomly selected Standard & Poor’s 500 firms between 1999 and 2004. Sample firms come from a wide range of industries and vary in both age and size of the firm. Equality-of-means tests on firm performance and firm age show that the randomly selected firms are not different from the S&P 500 firms not selected.

**Data**

The Securities Data Corporation (SDC) Database on Alliances and Joint Ventures is the primary source of information regarding the joint ventures. Executives were coded as members of the top management team (TMT) if they were identified by the Investor Responsibility Research Center as occupying one or more of the following positions at their firms: Chief Executive Officer, President, Chief Financial Officer,
Chief Operational Officer, Executive Vice President, Senior Vice President, or Secretary. Data was also gathered from SEC filings and Dun and Bradstreet’s Million Dollar Database.

Variables

**Dependent Variable.** *Alliance portfolio diversity* is calculated as a heterogeneity index (Blau, 1977; Blau *et al.*, 1982) related to the four-digit SIC codes of each firm with which a focal firm has an existing joint venture (JV) relationship. A high score indicates a high degree of diverse potential knowledge which can be exchanged between partner firms. This measure is calculated as:

\[
1 - \sum p_i^2
\]

where \( p \) is the proportion of sample in a given category and \( i \) is the number of different categories across the sample.

Index measures are commonly used to assess diversity in categorical data. A perfectly homogeneous population would have a diversity index score of 0. A perfectly heterogeneous population would have a diversity index score of one (assuming infinite categories with equal representation in each category). As the number of categories increases, the maximum value of the diversity index score also increases.

**Independent Variables.** *TMT external social capital connections* for a firm is the sum of the count of each TMT executive’s memberships on boards of directors. *TMT external social capital strength* is the composite count of the number of years TMT executives have been on the board of directors of other firms.

*Firm external social capital connections* is operationalized as a count of the firm’s direct connections—the number of joint ventures in which the firm is involved—plus the firm’s indirect connections—the number of joint ventures of each of the firm’s partners. Direct connections are weighted twice as heavily as indirect connections to account for their greater influence on a focal firm (Lin, 1999; Vanhaverbeke *et al.*, 2002). A higher number of connections held by a particular firm suggests that firm has a higher degree of embeddedness within the overall network of firms. *Firm external social capital strength* is measured as the weighted total length of all of a firm’s direct and indirect connections, as defined above. Long-term connections among firms enhance the development of trust, mutual understanding, and commitment between partners (Collins and Hitt, 2006; Hitt *et al.*, 2006; Hoetker, 2005). For example, a firm which has been involved in two joint ventures with partner firms which are each involved in one other joint venture, with each of the joint ventures having a duration of three years, has a *firm external social capital connections* measure equal to six (2 direct connections * 2 (weight) + 2 indirect connections * 1 (weight)). This firm has a *firm social capital strength* measure equal to 18 (2 direct connections * 2 (weight) * 3 years + 2 indirect connections * 1 (weight) * 3 years).

**Control Variables.** To control for *firm performance* and *firm age*, the return on assets (ROA) earned by the firm in each year and the natural log of the number of years since the initial founding of each firm were respectively operationalized. *Year* is also a
control variable in this study. Furthermore, two industry-level controls were included as well: *industry revenue growth* is measured as the average level of revenue growth for firms represented in the sample for the firm’s primary SIC code, and *industry capital intensity* is measured as the average level of property, plant, and equipment held by firms within each firm’s primary industry. Finally, two additional firm-level factors were included: *firm-level revenue growth* and *capital intensity*. Each of these is measured as the natural logarithm of the values reported in the firms’ annual financial statements. Executive discretion is a multi-faceted construct shaping firm choices, including alliance formation, and is influenced by firm-specific factors and industry factors. According to Finkelstein and Boyd (1998), it is preferable to use multiple indicators of executive discretion; they argue that this multi-indicator design is superior because it is more efficient and is less biased than the alternatives. Following Hambrick and Abrahamson (1995), this study focuses on multiple indicators of executive discretion. First, the following industry-level indicators of executive discretion are used: a) *Industry Sales Growth*—measured as the average level of revenue growth for firms in each industry represented in the sample, and b) *Industry Capital Intensity*—measured as the average level of property, plant, and equipment held by firms within each industry. In addition, the study followed Finkelstein and Boyd’s (1998) approach by also including the following measures of executive discretion: a) *firm sales growth* and b) *firm capital intensity*.

**Data Analysis**

The analyses in this study are based on a fixed-effects approach to control for omitted variables. Moreover, since the data for this study are panel data, cross-sectional time-series regression analysis are required to control for heteroskedasticity, autocorrelation among error terms, and contemporaneous correlation among residuals (Certo and Semadeni, 2006). The analyses were conducted at firm-year level with a total number of 1,654 observations after aggregating relevant firm data and accounting for missing observations.

**RESULTS**

Basic descriptive statistics for variables in this study are reported in Table 1. The results for the hypotheses testing are reported in Table 2. The effect of control variables alone can be seen in Model 1. Model 2 includes the TMT-level social capital variables. Model 3 includes the firm-level social capital variables, whereas Model 4 presents the results of including TMT- and firm-level variables in a combined model.
Table 1

Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Alliance Portfolio Diversity</td>
<td>0.64</td>
<td>0.18</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Year</td>
<td>0.30</td>
<td>0.46</td>
<td>0.00</td>
<td>1.00</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Firm Performance</td>
<td>0.03</td>
<td>0.62</td>
<td>-0.01</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Firm Age</td>
<td>3.99</td>
<td>0.89</td>
<td>0.05</td>
<td>0.06</td>
<td>0.06</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Firm Sales Growth</td>
<td>0.49</td>
<td>0.70</td>
<td>-0.04</td>
<td>0.01</td>
<td>-0.04</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Firm Capital Intensity</td>
<td>6.17</td>
<td>1.37</td>
<td>0.17</td>
<td>0.05</td>
<td>0.33</td>
<td>-0.01</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Industry Sales Growth</td>
<td>0.02</td>
<td>0.06</td>
<td>-0.05</td>
<td>0.04</td>
<td>-0.05</td>
<td>0.00</td>
<td>0.01</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8. Industry Capital Intensity</td>
<td>6.25</td>
<td>1.57</td>
<td>0.10</td>
<td>0.00</td>
<td>0.29</td>
<td>0.00</td>
<td>0.42</td>
<td>-0.01</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. TMT External Social Connections</td>
<td>1.26</td>
<td>0.41</td>
<td>-0.10</td>
<td>0.03</td>
<td>0.07</td>
<td>0.02</td>
<td>0.19</td>
<td>0.04</td>
<td>0.02</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. TMT External Social Capital Strength</td>
<td>3.20</td>
<td>1.41</td>
<td>-0.02</td>
<td>0.21</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.18</td>
<td>0.02</td>
<td>0.01</td>
<td>0.31</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Firm External Social Connections</td>
<td>7.67</td>
<td>3.88</td>
<td>0.02</td>
<td>0.03</td>
<td>0.20</td>
<td>0.04</td>
<td>0.41</td>
<td>0.01</td>
<td>0.17</td>
<td>0.13</td>
<td>0.00</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Firm External Social Capital Strength</td>
<td>12.42</td>
<td>4.70</td>
<td>0.21</td>
<td>0.03</td>
<td>0.22</td>
<td>0.02</td>
<td>0.39</td>
<td>-0.01</td>
<td>0.21</td>
<td>0.11</td>
<td>0.00</td>
<td>0.49</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>
Table 2
Regression Models
(Cross-Sectional Time-Series Regression)

<table>
<thead>
<tr>
<th>Dependent Variable = Alliances Portfolio Diversity</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>0.107 †</td>
<td>0.121 *</td>
<td>0.027</td>
<td>0.047</td>
</tr>
<tr>
<td>Firm Performance</td>
<td>0.002</td>
<td>-0.029</td>
<td>-0.246 *</td>
<td>-0.129</td>
</tr>
<tr>
<td>Firm Age</td>
<td>0.000</td>
<td>-0.051</td>
<td>-0.341 *</td>
<td>-0.446 **</td>
</tr>
<tr>
<td>Firm Sales Growth</td>
<td>0.006</td>
<td>-0.004</td>
<td>0.170 ***</td>
<td>0.056</td>
</tr>
<tr>
<td>Firm Capital Intensity</td>
<td>0.040 *</td>
<td>0.343 ***</td>
<td>0.094 *</td>
<td>0.155 **</td>
</tr>
<tr>
<td>Industry Sales Growth</td>
<td>-0.001</td>
<td>-0.362</td>
<td>0.045</td>
<td>-0.054</td>
</tr>
<tr>
<td>Industry Capital Intensity</td>
<td>-0.001</td>
<td>0.140 *</td>
<td>0.000</td>
<td>0.022</td>
</tr>
<tr>
<td>TMT External Social Capital Connections</td>
<td>0.483 ***</td>
<td></td>
<td></td>
<td>0.316 ***</td>
</tr>
<tr>
<td>TMT External Social Capital Strength</td>
<td>0.285 ***</td>
<td></td>
<td></td>
<td>0.194 ***</td>
</tr>
<tr>
<td>Firm External Social Capital Connections</td>
<td></td>
<td></td>
<td>1.615 ***</td>
<td>1.153 ***</td>
</tr>
<tr>
<td>Firm External Social Capital Strength</td>
<td></td>
<td></td>
<td>0.425 ***</td>
<td>0.369 ***</td>
</tr>
<tr>
<td>Wald chi²</td>
<td>30.634 *</td>
<td>102.107 ***</td>
<td>162.081 ***</td>
<td>217.152 ***</td>
</tr>
</tbody>
</table>

Notes: N = 1654; † p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001

The results of the analyses provide general support for the hypotheses. Hypothesis 1 is supported; a positive relationship is found between TMT external social capital connections and alliance portfolio diversity in Model 2 and Model 4 (p<0.001 for both models). Thus, the larger the number of social capital connections held by a firm’s top management team members, the higher diversity of a firm’s alliance portfolio. Consistent with Hypothesis 2, there is a positive relationship (p<0.001) between TMT external social capital strength and alliance portfolio diversity in Models 2 and 4. Collectively, these results indicate that extensive and strong TMT social capital relationships likely facilitate a firm’s ability to form alliances that can be important sources of knowledge for the firm. Models 3 and 4 indicate a strong positive relationship (p<0.001) between firm external social capital connections and alliance portfolio diversity, supporting Hypothesis 3. This suggests that a firm having a larger number of joint venture partners also tends to generally have a more diverse group of partners. Hypothesis 4 is also supported as the relationship between firm external social capital strength and alliance portfolio diversity is positive and statistically significant (p<0.001) for Models 3 and 4.
DISCUSSION AND CONCLUSION

The findings of this study support the notion that a firm's overall alliance portfolio diversity is positively influenced by the number and strength of two different levels of social capital factors: top management team level and firm level connections. The first set of findings, focused at the TMT level, support the perspective that the number and strength of social capital connections act as a positive stimuli to the diversity of a focal firm's portfolio of partnerships. These results suggest that top management teams should focus on expanding the number and strength of their professional social capital connections. By doing so, executives may expect to reap the private benefits of social capital such as job attainment, power, career reputation, and career progress. For the firm, strengthened TMT social capital may lead to benefits such as recognition of new market opportunities (including possible market development or diversification opportunities), possible formation of new partnerships, and access to timely and not readily available competitive information. In turn, this competitive information may improve decision-making and increases the odds of success for strategic decisions (such as acquisitions, mergers, and divestitures). Furthermore, top management teams can enhance their respective firm's alliance portfolio diversity by serving on diverse and numerous boards of directors. Such involvement can not only provide the benefits that were previously mentioned, but also can provide higher status to those executives involved in outside activities. This benefit can be especially significant for larger firms such as those in the S&P 500. As a result, a focal firm with executives who hold outside board memberships may become more attractive to stakeholders including potential alliance partners and investors.

Strong TMT-level social capital connections, marked by close and frequent interaction over a number of years, can stimulate in-depth understanding of partners and ease information sharing as well as the development of shared norms and routines if needed. It is important to note that often top management teams might gain benefits, such as information and resource sharing from both explicit procedures, i.e., transfer of technology and equipment, and informal interactions of employees during alliance activities (Cui and O'Connor, 2012). Informal interactions can create a different type of synergy and involvement that complement formal interactions as well as produce unexpected opportunities and possible new connections. Based on the results of this study, top management teams and firms should pursue a portfolio that is composed of a large number of strong social capital connections.

The second set of findings evidence the benefit of having several strong inter-firm partnerships. Specifically, the number and strength of social capital connections held at the firm level act as a positive stimulus to the diversity of a focal firm’s portfolio of partnerships. Having a large number of firm-to-firm partnerships increases the diversity found within a focal firm’s partnership portfolio. This effect is even greater when such partnerships are long term in nature. As firms form a greater number of alliances they also become more experienced in managing alliances over time. Such experience may allow firms to feel more comfortable with partnerships, have access to and share resources and knowledge to which they might otherwise not have had access, and, eventually, form alliances with dissimilar partners. Furthermore, positive partnership experiences with diverse partners could lead to growth strategies aimed at
new markets such as market development and diversification. Overall, it is recommended firms aim to maintain strong inter-firm relationships, defined by trust, mutual cooperation, and a lack of opportunistic behaviors within their alliance partnership portfolio.

Another benefit derived from having a larger number of strong inter-firm partnerships stems from the fact that these partnerships can be a driver of firm innovation which is considered an essential part of a firm’s efforts to compete in the global market, retain market share, and sustain competitive advantage (Jiang et al., 2010). Innovation can improve due to being able to draw from a pool of varied resources. Diversity within a firm’s portfolio of partnerships increases the number of new resource and knowledge combinations possible, which ultimately improves creativity and learning (Sampson, 2007). Combining a larger number of strong firm-level social capital connections with a dedicated alliance function holds significant potential for capturing innovation benefits. Resource diversity contributes to innovation when a firm has greater control over its alliances, whereas a diminished or non-existent control over alliance negatively can impact firm innovation (Cui and O'Connor, 2012). Thus, an increased number of strong social capital connections improve a firm’s alliance portfolio diversity, which in turn can help fuel innovation.

Moreover, the involvement of firms in a diverse portfolio of alliances could also lead to improvements in the overall efficiency of value chain activities. Thus, areas such as marketing, research and design, supplier selection, and value delivery networks can be revised and improved as a result of having access to a diverse pool of knowledge via the firm’s alliance portfolio. The parties involved can seek collaboration and exchange knowledge to be able to improve the value creation of these areas as well as their flexibility (Jiang et al., 2010). As a result, firms can be positioned to achieve their goals and objectives from an enriched view since they can be exposed to a partner’s best practices, conduct benchmarking activities, and consider alternative solutions that they otherwise might not have considered.

LIMITATIONS AND FUTURE RESEARCH

Future work could also further the understanding of factors that positively and negatively impact alliance portfolio diversity. In addition to the number and strength of social capital connections, it also would be worthy of study to test whether specific governance mechanisms, organizational structure, or resource configurations have an impact on alliance portfolio diversity. The organizational context within which firm-level choices are made surely has an influence on firms’ alliance partner selections, examining that context could provide an even richer understanding of alliance portfolios.

One limitation of this study is the lack of control for top management team functional or educational heterogeneity in the analyses. These are possible sources of executive cognitive and experiential diversity that may have some influence on the alliances the top management team chooses to form. Gaining access to these data are challenging but examining their influence would make for a more interesting and robust study.
Another limitation can be found in the lack of specific industry focus of the companies that form this study. The companies selected reflect a wide array of industries and thus an industry-specific study could bring light to different results. Such future study could also address industry specific variables that explain such results. Issues such as industry-specific norms of competition, industry profitability, regulatory intensity, and rates of technology obsolescence are among the multiple potential industry influences on partnership formation patterns. For example, some industries are likely much more prone to partnering among peers than other industries. Examining how such propensity to partnership shapes the diversity found within firms’ alliance portfolios would be a very interesting extension of this work.

Furthermore, future research in alliance portfolio diversity could be conducted at different levels of industrialization to test whether a country’s level of development exerts a moderating role on alliance portfolio diversity. Barriers such as level of government bureaucracy, access to technology, levels of corruption and perceived bribery also could have negative effects on portfolio alliance diversity as well as on the development of social capital connections.

References


The experience of office bullying appears to be commonplace, with approximately thirty-five percent of the workforce reporting psychological and/or physical abuse (Workplace Bullying Institute [WBI], 2011). Websites, public forums, and media scrutiny have made bullying an everyday topic. Correspondingly, there has been renewed attention in academic studies on this increasing form of interpersonal violence. Much of bullying research has focused on: (1) a description of the phenomenon and its widespread impact; (2) perpetrator and target characteristics; (3) outcomes such as stress and somatic complaints; and (4) the aftermath on firms (Namie, 2003; Rayner and Hoel, 1997; Salin, 2003). Untangling the causes and consequences of adult bullying can be complex because according to Rayner and Hoel (1997: 188): “The breadth of the phenomenon encompasses many different forms of behavior...”

More than half of targets in workplace bullying cases are women (WBI, 2011). A potential explanation is that stereotypes regarding their behavior (in some cases)

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1 This research was supported through a Faculty Non-Instructional Assignment grant awarded to the first author by Middle Tennessee State University. We are grateful for this support. We would like to thank the editor, Bienvenido Cortes, and two anonymous reviewers for their helpful guidance and suggestions on earlier versions of this manuscript.
remain stubborn (Duehr and Bono, 2006). Moreover, when women display incongruent role behaviors they may be punished (Berdahl, 2007; Eagly and Sczesny, 2009). However, the research lacks in describing what may happen when women attempt to defend themselves from a bullying attack, and, if any form of organizational intervention can improve the situation. As Rayner and Hoel (1997) have alluded, studying a confluence of variables (as opposed to univariate factors) may be necessary to understand how deviant workplace acts unfold.

The purpose of this paper is to investigate how men and women are differentially perceived when they are bullied at work, and whether the existence of a civility policy makes a positive difference. Specifically, the following studies explore whether women who violate gender norms are viewed as more responsible when bullied (as compared to men), and if aggressors are considered less justified when organizations have institutionalized anti-bullying measures. The researchers suspect there are undercurrents of enhanced responsibility (and perhaps a lack of perceived collegiality) when a woman defends herself in a bullying scenario. The researchers also speculate that a civility policy can impact the way individuals process situations.

Perceived levels of target collegiality and responsibility, rater hostile sexism, and bully justification (and their interaction with target gender, reaction, rater sex, and rater race) are analyzed under conditions where a civility policy is and is not present. This study examines the interaction of these variables to extrapolate information for future research.

LITERATURE REVIEW

The Workplace Bullying Institute (WBI) defines bullying as “repeated, health harming abusive conduct committed by bosses and co-workers” which can include “sabotage by others that prevent[s] work from getting done, verbal abuse, threatening conduct, intimidation, and humiliation” (WBI, 2011: “What is Workplace Bullying?”). The preponderance of bullying behavior is the result of non-physical assault (Salin, 2003), such as verbal and psychological attack. These assaults can include shouting, mobbing (the infliction of abuse from a group directed toward a single individual), insults delivered in an audience setting, ostracism, blowing things out of proportion, wielding power in a manner designed to put people in their place (e.g., officiousness), misplaced blame, disrespectful discourse, and using positional power to leverage work-related credit. Bullying is not an across-the-board workplace phenomenon, but is pinpointed toward certain individuals (Salin, 2003). The majority of bullied persons are either subordinate in rank (by 71%) or are direct reports (Namie, 2003).

Workplace Bullying: Gender and Race

The social construction of gender affects the frequency, duration, and type of bullying that women experience. Bad behavior does not impact genders equally, with women reporting “scapegoating” and bullying from both colleagues and subordinates (Salin, 2005). Only female respondents in Salin’s (2005) study noted they were targets of subordinate bullying.
Differential treatment could be the result of cultural conditioning. Girls, for example, are taught that displaying competence, aptitude, or ambition may have negative overtones (Fisher and Davis, 1996). Consequently, when expectations of “feminine” behavior are thwarted (e.g., when women are considered “bully broads”), they may suffer consequences (Eagly and Sczesny, 2009), even from their own gender (Cikara and Fiske, 2009). These perceptions are compounded by hostile sexism, which encompasses negative stereotypical, derogatory, and patronizing attitudes toward women. Hostile sexism manifests in covert discriminatory behaviors, or in “selective incivility.” To avoid organizational sanction, bullies may use underhanded means of expressing prejudicial attitudes within companies (Barreto et al., 2009).

According to Berdahl (2007), assertive or “uppity” women in male-dominated firms are the ones who have the highest chance of experiencing sexual harassment: “... sexual harassment is driven not out of desire for women who meet feminine ideals, but out of a desire to punish those who violate them” (Berdahl, 2007: 434). Could the same hold true for women who display behaviors that are considered outside the norm of “acceptable” female conduct?

Because of ingrained socialization patterns and corresponding expectations, assertive women may be on the receiving end of harsh judgments from other people. Furthermore, disrupting male/female norms of interaction could be perceived as inappropriately “stepping out of bounds” (Babcock and Laschever, 2003). Statistical discrimination indicates that the number of women in leadership positions is small, and as a result, stereotypic notions are slow to change (Eagly and Sczesny, 2009).

The above research taken as a whole suggests that women have a narrower band of acceptable behaviors than men; in other words, they are expected to walk a behavioral tightrope that fits with societal expectations regardless of the situation (Babcock and Laschever, 2003). In addition, those who veer toward the hostile side of the ambivalent sexism spectrum may negatively evaluate women who display behaviors considered masculine, or that violate “traditional gender roles” (Masser and Abrams, 2004). Some have suggested that women are unjustly blamed even when they are harassed or assaulted (Masser and Abrams, 2004; Miner-Rubino and Cortina, 2004).

In a related vein, Fox and Stallworth (2005) reported that scant attention has been paid to studying the nexus of workplace bullying and race. According to the Workplace Bullying Institute (WBI, 2011), Hispanics report the highest rates of bullying, African-Americans the second highest, and Asians the lowest. Interestingly, Fox and Stallworth (2005) found that although Asian, African-American, and Hispanic/Latino groups indicated higher levels than Whites, only Hispanic/Latino participants experienced greater general levels of bullying that were unrelated to either their race or ethnicity. Correspondingly, the WBI (2011) concluded that current laws and company practices have been insufficient to address the harassment of racial minorities. Based on their history of discrimination, it is proposed here that both women and persons of color may react more strongly to bullying in the workplace than whites.

**Workplace Bullying Policy**

The WBI (2011) survey revealed that there is support for legislation that would dissuade employees from harassing their coworkers. According to Namie, it is time to
“... treat workplace bullying the same as sexual harassment or racial discrimination ... and to establish rules of conduct and penalties” (2003: 1). To this end, organization-wide structures, policies and procedures, and regular interventions must be crafted to curb bullying (Daniel, 2006; Lewis and Orford, 2005). Employers should respond by: (1) giving due consideration to the target complaint; (2) providing a safe environment for the complainant; (3) investigating charges of abuse; and (4) differentiating bullying from interpersonal conflict (Namie, 2007).

The Society for Human Resource Management (SHRM, a human resources professional trade organization) reports that a mere three percent of organizations have a policy that is specific to workplace bullying (WBI, 2012). Ideally, procedures to prevent abuse at work should be led by an organization’s top administration in order to set the tone and corresponding expectations (Daniel, 2006; Namie, 2003). Behavioral procedure should be widely disseminated through in-house publications, and periodically reviewed through training exercises (Daniel, 2009). Namie (2003) also argues that coaching, counseling, and training should be part of a process to implement and enforce a civility policy. The bully should not be appeased, the target should not be blamed, and the bullying behavior should not be ignored (Daniel, 2006). Coworkers and managers, however, often sidestep the issue because they fear backlash from the bully (Daniel, 2006), and there is often no anti-bullying policy to inform employees’ actions. This lack of workplace procedure may soon change, as The Healthy Workplace Bill has been introduced in at least 25 states (WBI, 2013).

Although preliminary research has indicated diversity management and sexual harassment policies may in fact prevent work abuse (Gilbert and Stead, 1999; Stockdale and Bhattacharya, 2009), little if any research has investigated the impact civility policies may have on organizations. Considering this gap within the literature (and the importance of the issue), a closer examination of steps to create a better working environment is warranted. Kelly (2006), for example, recommends a trans-disciplinary investigation involving professionals from multiple spectrums to construct a civility code. To complement their perspective, Rayner et al. (2002) advocate trying to “crack the complexity” by using data collection to delineate factors that contribute to workplace bullying.

The first study attempts to address Rayner et al.’s (2002) suggested course of action by exploring the role civility policies have on influencing perceptions of bullied targets (particularly those who attempt to defend themselves). The broad research question is explored in R1, while the [dual] role of hostile sexism as an independent variable is examined in R2. Previous studies have found that gender accounts for variance in hostile sexism (Glick et al., 2000; Napier et al., 2010). As such, it is possible that race may also be a contributor [R1]. In turn, hostile sexism may be associated with negative perceptions of women [R2].

R1: How do the independent variables of gender, reaction, bullying policy, rater sex, and rater race impact perceived levels of collegiality, responsibility, bully justification, and hostile sexism?

R2: Does hostile sexism impact the way women are perceived within a bullying scenario?
The literature suggests that women who defend themselves when bullied may be perceived as less collegial and more responsible for the bullying incident. It is possible, however, that a civility policy might mitigate those perceptions. In addition, individuals who are impacted by inequity at work might react more strongly to bullying incidents.

The proposed research is a step toward understanding the complexities of workplace bullying by investigating whether the existence of a civility policy mitigates negative perceptions toward individuals who violate expected gender norms. This exploratory study builds upon previously published work (using student samples) that tested the influence of policy on decision-making (e.g., Gilbert and Stead, 1999; Heilman et al., 1992).

METHOD

A total of 238 students enrolled in advanced business courses agreed to participate in this research. This study was conducted at a four-year institution in the Southeast, with a sample comprised of 145 men and 93 women. Due to the small number of persons of color, the original survey descriptors of Asian-American, Hispanic, African-American, White, and Native American were collapsed into one variable (race) with two categories - white and persons of color. There were 190 white and 48 persons of color within the sample. Respondents were from a primarily “commuter” university, with an average age of 23 years, average full-time work experience of 2.53 years, and average part-time work experience of 4.72 years. Some students at this institution are considered “non-traditional,” in that they are returning after a hiatus, and/or have full-time work and family obligations. Based on the sample, they have high average working experience and consist of predominantly working students. The average age for undergraduate students at this university is 23, which appears above the norm compared to that of other undergraduate institutions.

The distributed surveys were based on a crossed manipulation, with variables of policy (bullying policy, no bullying policy), reaction (reaction or no), and gender (male, female). In other words, this research investigated if individuals (either male or female) who were bullied under the organizational rubric of a bullying policy (or no policy) were differentially treated based on whether they chose to defend themselves when attacked (reaction), or remained silent (no reaction). There was a mean cell size of 29.75 across all eight conditions.

Packets were distributed within class time to advanced management and marketing students; subjects were informed that their participation was voluntary, and could be discontinued at any time. The first pages in distributed packets consisted (in order) of: (1) a cover sheet explaining the study on which subjects recorded demographic information; and (2) a meeting scenario accompanied by questions. In the “Reaction” scenario, an employee “Debra” interrupts “Tony” (the district manager) during a sales meeting to explain an alternative viewpoint. Tony castigates her in an explosive manner. However, Debra defends herself before the group, rising to Tony’s tenor and volume. In the “no reaction” scenario, Debra chooses to say nothing. The same scenario (in a different manipulation) was presented using a male-
bullied target, “Ed.” Group composition was stated in the “Scenario Background Information” as primarily male to heighten the gender manipulation:

12 men: 8 district managers, 4 sales people
3 women: 1 senior sales person, 2 new hires

The next page consisted of a resume for each candidate (Ed or Debra), which included information regarding their education, employment, awards, and associations (which remained the same across conditions). “Employees” received several awards including The Gold Circle Sales Club Award and the Most Promising Junior Salesperson. The club name “Swedish American Association” was included in the “Associations” section so that sex and not race would appear salient. Both candidates held both a BBA and an MBA in Marketing. On the respondent sheet, subjects were asked (and in many instances correctly identified) the applicant name and club as manipulation checks. The candidates’ average job performance rating across all conditions was 6.67 on a nine point bi-polar scale. Half of the surveys contained an “Anti-bullying policy.” [This policy was adapted from SHARP, Research for Safe Work, with permission]. It included statements pertaining to the definition of workplace bullying, employee rights in a civil environment, investigation procedures, disciplinary action, and cultural tone.

Similar to the Gilbert and Stead (1999) study, the research design and manipulation check were patterned after Heilman et al. (1989). One of the primary dependent variables was a three item measure of collegiality (adapted from Gilbert and Lownes-Jackson, 2005), measured on a nine-point bi-polar scale. The second dependent variable was the Hostile Sexism subscale from the Ambivalent Sexism Inventory (Glick and Fiske, 1996) (used with permission). Two other single-item variables were used in this research: Justified (Do you think that the senior managers were justified in their reactions toward this employee?) and Responsible (How responsible do you think that this employee is for the incident that occurred?) (adapted from Gilbert, 2005) both measured on a nine-point bi-polar scale. Coefficient alphas for the collegiality and hostile sexism scales were 0.71 (three items), and 0.88 (eleven items), respectively.

RESULTS

A multivariate analysis of variance (MANOVA) was used to test the differences on four dependent variables (Responsible, Justified, Hostile Sexism, and Collegiality) based on five factors or class variables (Gender, Reaction, Policy, RaterSex, and RaterRace). This model simultaneously tested all interactions and main effects of the five factor variables to the four dependent variables. Because the groups had an unbalanced sample, Least Square Means (LSMs) was used to compare group means. In all multiple comparison means (post hoc tests) from different groups, Tukey’s HSD was used.

MANOVA indicated that the interaction effects of five factor (independent) variables on the four dependent variables Responsibility, Justified, Hostility, and

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2 Due to transcription wording, the last item of the Hostile Sexism Inventory was not reverse scored, as in the original research of Glick and Fiske (1996).
Collegiality were not significant. However, it indicated that the interaction effects of four factor independent variables (Gender, Reaction, RaterSex, and RaterRace) on the four dependent variables were significant with Wilks' $\lambda = 0.93; F(4, 203) = 3.77; p < 0.0063$ and power of the test $(1 - \beta) = 0.89$. The MANOVA also indicated that the interaction effects of four independent variables (Gender, Policy, RaterSex, and RaterRace) on the four dependent variables were significant with Wilks' $\lambda = 0.94; F(4, 203) = 3.29; p = 0.0121$. Further results showed that among the four dependent variables, Collegiality and Responsibility were affected by the interaction effects of four independent variables. The dependent variable Justified was affected by the interaction effects of two independent variables Gender and Policy, whereas the dependent variable Hostile Sexism was only affected by the main effect of RaterSex. More detailed analyses revealed some interesting findings.

Although four way interactions are infrequently reported, this study provides these analyses to showcase the complex interplay between civility policy and associated variables. These results are offered in the spirit of more fully understanding the profound interconnection among a variety of factors (see Table 1 for a summarization of the interaction and main effects).

**Collegiality.** (1) Interaction effects of independent variables Gender, Policy, RaterSex, and RaterRace were significant on the dependent variable of Collegiality: $F(1, 206) = 5.99$ and $p = 0.0151$, with means = 7.78 and 4.00, and standard deviations 0.96 and 1.62, respectively. In other words, male persons of color rating men (Ed) indicated that those in the Policy scenario were more collegial.

(2) A second (surprising) four-way interaction revealed that male raters (persons of color) within the policy condition rated the man (Ed) as more collegial than did their female rater (persons of color) counterparts. In this interaction, means = 7.78 and 3.67, and standard deviations 0.96 and 1.73, respectively. Both interactions (1) and (2) are displayed in Figure 1.

(3) Collegiality was also significantly affected by the four-way interaction of Gender, Reaction, RaterSex, and RaterRace: $F(1, 206) = 4.20$ and $p = 0.0421$ with means = 7.17 and 4.73, and standard deviations 1.34 and 1.27, respectively. Results showed that male raters (persons of color) rated men (Ed) when he reacted as more collegial than did their female (persons of color) counterparts.

(4) **Responsibility.** The dependent variable “Responsible” was significantly affected by the interaction of Gender, Policy, RaterSex, and RaterRace with $F(1, 206) = 5.37$ and $p = 0.0211$. The difference was found between male and female persons of color in the no policy condition, with means = 7.00 and 5.66, and standard deviations = 0.62 and 0.51, respectively. The interpretation is that male raters (persons of color) in the no policy condition rated Ed as more responsible for the bullying incident than their female (persons of color) counterparts.

(5) **Justified.** Analyses also indicated a significant interaction $F(1, 206) = 4.19$ and $p = 0.0421$ between the variables Gender and Policy on the dependent variable Justified. Further examination showed that the difference appeared in the policy versus the no policy condition. In the “no policy” condition (in which Ed was rated), supervisors were seen as more justified in their reactions compared to the policy manipulation. The means (and standard deviations) for the male ratees in the no policy and policy conditions were 4.46 (0.38) and 3.72 (0.32), respectively.
Table 1
Mean Comparisons of Collegiality, Responsibility, Justified, and Hostile Sexism
based on Interaction and Main Effects

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Factors</th>
<th>M</th>
<th>SD</th>
<th>Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collegiality</td>
<td>Men<em>rater males</em> rater persons of color</td>
<td>7.78</td>
<td>0.96</td>
<td>Policy &gt; No policy *</td>
</tr>
<tr>
<td></td>
<td>Policy</td>
<td>4.00</td>
<td>1.62</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Men<em>policy</em>rater persons of color</td>
<td>7.78</td>
<td>0.96</td>
<td>Rater Males &gt; Rater Females *</td>
</tr>
<tr>
<td></td>
<td>Rater males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rater females</td>
<td>3.67</td>
<td>1.73</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Men<em>react</em>rater persons of color</td>
<td>7.17</td>
<td>1.34</td>
<td>Rater Males &gt; Rater Females *</td>
</tr>
<tr>
<td></td>
<td>Rater males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rater females</td>
<td>4.73</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td>Responsible</td>
<td>Men<em>no policy</em>rater persons of color</td>
<td>7.00</td>
<td>0.62</td>
<td>Rater Males &gt; Rater Females *</td>
</tr>
<tr>
<td></td>
<td>Rater males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rater females</td>
<td>5.66</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Justified</td>
<td>Men*policy</td>
<td>3.72</td>
<td>0.32</td>
<td>Policy &lt; No policy *</td>
</tr>
<tr>
<td></td>
<td>No policy</td>
<td>4.46</td>
<td>0.38</td>
<td></td>
</tr>
<tr>
<td>Hostile Sexism</td>
<td>RaterSex</td>
<td>2.62</td>
<td>0.26</td>
<td>Rater males &gt; Rater Females **</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>1.84</td>
<td>0.20</td>
<td></td>
</tr>
</tbody>
</table>

Significant Difference: * p < 0.05; ** p < 0.01
(6) Finally, the only dependent variable with no significant interaction effect was Hostile Sexism. In other words, rater sex was a main effect of Hostile Sexism $F(1, 206) = 8.60$ and $p = 0.0040$; $F(1, 206) = 8.60$ and $p = 0.0040$. The results showed that male subject raters displayed more hostile sexism than female subject raters (across all experimental conditions). The means (and standard deviations) for RaterSex in this main effect for men and women were 2.62 (0.26) and 1.84 (0.20), respectively.

From the prior literature review, Hostile Sexism can be considered as both an independent and dependent variable. It may be differentiated by demography, and it may also impact how individuals are perceived. The role of hostile sexism as an independent variable was explored using a two way ANOVA, with the variables of Gender and Hostile Sexism as independent variables, and Responsibility as a dependent variable. Using a median split to dichotomize hostile sexism, results displayed a significant interaction effect between Gender and Hostile sexism on the perception of responsibility, with $F (1, 230) = 6.54$ and $p-value = 0.01$, suggesting that under conditions of high hostile sexism, women were considered more responsible for the bullying incident than men. This interaction is displayed in Figure 2.
Qualitative Analyses. In an effort to provide analyses from multiple perspectives and methodologies, a qualitative analysis was conducted in a small, southeastern city to assess how men and women were viewed within conflict situations at work. This follow-up study consists entirely of working adults, and is included to provide more of a “real world” element to the research findings. Specifically, the methodology is modeled after Tepper (2000), who used random digit dialing. Of the 387 individuals contacted, 55 were not eligible for the study because they were not working full time (nor had a supervisor), and 265 declined participation. Of the 67 who agreed to participate, eleven returned usable questionnaires in an enclosed business envelope, for a response rate of 16.4%. The average respondent age was 48, and the average full time work experience was 24 years. All but one individual reported some type of advanced degree course work, and all respondents were white. Only three reported that a “bullying policy” was in force at their workplace. The sample was comprised of six women and five men.
Subjects were asked to respond to two questions: (1) Who is bullied at work: men or women? Who do you think are worse bullies? (2) Who do you think is more likely to defend themselves when bullied at work: men or women? In both instances subjects were asked to provide a rationale for their responses. Based on a review of the relevant literature, results were categorized into subsets representing four distinct theoretical streams:

1. **Androgynous.** Stereotypical expectations (while not overtly communicated) are still prominent, despite increasing numbers of women in managerial positions (Barreto et al., 2009). One exception is Dickman and Eagly (2000) who found an increase in gender androgyny.

2. **Hierarchical dominance.** Across cultures and ethnicity, men have been assumed to have greater latitude in behavioral expression; this supposition has even been supported in frequency of bullying reports. In their study of position status and workplace aggression, Lee and Brotheridge (2011) found that men at work reported using both indirect and direct forms of aggressive behavior more than women.

3. **Internalized sexism.** “Internalized sexism refers to women’s incorporation of sexist practices, and to the circulation of those practices among women, even in the absence of men” (Bearman et al., 2009: 11). Bearman et al. (2009) suggest that sexist treatment women receive is reflected in self-denigrating attitudes and interactions with others. Similarly, Babcock and Laschever (2003) report negative reactions from both genders in their research on perceptions of women initiating negotiations for higher compensation.

4. “Walk the line.” Executive women in the Ragins et al.’s (1998) study suggested the following behaviors to counter male resistance: “Do not make waves. Do not disagree and be correct (kiss of death!). [Working] longer, harder, smarter means nothing if you have a mind of your own and express your own ideas and opinions” (Ragins et al., 1998: 30). These women were careful not to “upstage” men, and to walk a fine line in terms of response to their peers. The qualitative analyses are represented in Tables 2 and 3.

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### Table 2

**Categorical Representation of Targets and Bullies by Gender**

Who is bullied at work, men or women? Who do you think are worse bullies?

**Androgynous**

Bullies are looking for weak people, or easily intimidated. The sex seems secondary. Speaking as a professional I have seen both sexes bully - they just do things in a different manner. (F)

I work in an elementary school. Most employees are women. Only 3-4 men in the building daily. Most bullying occurs with student body (children K-5th graders). (F)
I am a teacher. I don’t feel bullied by anyone. Years ago there was one female who bullied me and others. She didn’t last long though. I’m not sure bullying is gender related. I think it is more personality, character, or even genetic related. (F)

No male/female difference as long as intimidation without that of physical violence is considered bullying (e.g., that of poor performance rating or exclusion from an activity). (M)

**Internalized sexism**

I’m not sure what you would define as “bullied” as it applied to adults. I can say that I have known all my life that women are the hands down worst back-biting, sabotaging, passive-aggressive gender from infancy on. This is not better in adulthood or in the workplace. I have only two or three female friends. I have always preferred to hang out with and talk to males. (F)

In education it’s mostly women in the early grades. Women bully other women - over clothing, hair, educational level, power making decisions, student rolls, seniority. All leads to power and control issues. (F)

**Hierarchical dominance**

Men are to provide their dominance and/or because they are mentally unstable (specific instance with the worst offender). (M)

Men are “worse” bullies due to increased likelihood of physical threat/intimidation as part of bullying. (M)

I have run into more women bullies who seem to have a need to prove themselves up front in order to gain respect and get other people to do what they need later in the project. (M)

The perennial problem with males . . . is their insecurity around smart strong females. Their reactions have always been some form of put-down and dismissiveness. (F)

I think women are more bullied at work, but that both genders are equally bad bullies. Most bullies, regardless of their gender, are more likely to view women as vulnerable and less likely to defend themselves. Consequently men and women bullies target more women than men. (M)

Women – this is the South, it still remains a man’s world. I am a nurse – men always have a higher salary – even if classified as peers doing the same job. This causes conflicts and men are not disciplined the same. In most medical settings women are in charge and they tend to take out their frustrations on other women. They are intimidated by men. Women do not have a hierarchy like men and they do not stick together even for a common goal. (F)
“Walk the line” orientation

I believe that men have more issues. Testosterone is a bigger trouble maker than estrogen. Men are more like to be bullies but I believe when women are bullies they can be much worse. They seem to be more methodical about bullying and less likely to quit. Also they appear to have a better ability to be careful about it to avoid getting caught. (M)

Table 3
Categorical Representation of Defense by Gender

Who do you think is more likely to defend themselves when bullied at work, men or women?

Androgynous

Men won’t necessarily defend themselves – they just don’t engage in my line of work. (F)

I think both are equally likely to defend themselves. It depends on the individual. (M)

Women – they have a stronger advocacy organization (via EEOC). And are more likely to take advantage of that facility. The men are afraid of repercussions later because the bully is never removed, just relocated within the organization. (M)

Internalized sexism

Women are absolutely more likely to defend themselves but they do it by going behind your back, criticizing you, without cause, to your superiors and spreading negative gossip to undermine your status. (F)

As a whole I would have to say men. They are leaders and will “fight” for their cause or rights. Women as a whole don’t like tension and will give in to make peace. (F)

Hierarchical dominance

Men – it is a man’s world – always has been and always will be especially in the South and in the Bible Belt. (F)

Men would seem to be more defensive and more likely to retaliate. Women show more emotion and “vent” their feelings as to where men “bottle” it up and they let go in a retaliatory form. (F)
Men more likely to defend themselves as they are more likely to “externalize” and women are more likely to “internalize.” (M)

Men. Of course I can only evaluate what I have seen in my profession. In health care women are generally “in charge.” Men generally intimidate women in the workplace. (F)

Women. Men are not as emotional and can take more in stride, while still setting small boundaries. (M)

“Walk the line” orientation

I would say women; they are more likely to handle it through the proper channels. Men don’t want to be a “tattle tale” which makes you seem weak. They will resort to violence but will typically try to avoid it to keep their job. (M)

The above categorizations are consistent with themes identified earlier in the literature review. Men for example were reported as more likely “to provide dominance,” and to engage in “put downs and dismissiveness” of strong, smart females, while at the same time engaging in “externalization” and “retaliation.” Women were more likely to use the formal reporting channels in place, while at the same time engaging in subtle, covert retaliation, that more befitting with gender role expectations of “niceness.” They also displayed overt denigration of their own gender, congruent with the notion of internalized sexism.

DISCUSSION AND FUTURE RESEARCH

Results of this study showed that male raters displayed more hostile sexism than female raters (across all experimental conditions), despite the fact that the average age of men was 22.98 years. In addition, hostile sexism negatively impacted how women were perceived. These findings confirm previous research, which found that when women display “atypical” behaviors (that is, when they violate societal gender norms), they may suffer negative repercussions (Babcock and Laschever, 2003; Eagly and Sczesny, 2009; Glick and Fiske, 1996). This difference is still evident, despite the fact that more women than men are enrolled in undergraduate (and in some graduate) programs (Barreto et al., 2009), and despite changing roles of men and women in both personal and professional spheres (Eagly and Sczesny, 2009). The gender disconnect signals there is still work to do in terms of sensitivity training to create empathy, and in providing education on the destructive nature of gender stereotypes (and the importance of replacing these with valid “sociotypes”). Future field studies could examine if civility policies are more effective in companies that already have procedures in place to promote equity (such as diversity management programs), and
in states and municipalities that have passed anti-bullying legislation. Relatedly, cross-cultural research could explore whether countries in which bullying is illegal fare more favorably (in terms of perceptions) than those in which there is no anti-bullying legislation. The fact that bullying is not illegal in the United States makes it easier for managers to ignore (Namie, 2003; Hankins, 2007).

These findings also indicate that in the male “no policy” condition, supervisors were seen as more justified in their reactions compared to the policy manipulation. In this case, anti-bullying policies do appear to have a positive impact, in that overbearing and “irrational” actions of the supervisor (and of the co-workers who sat idly by) may not have been considered good form. It is also both surprising (and somewhat disconcerting) to note that policy did not appear to have an impact for women – in other words, supervisors were considered equally justified in their reactions to women regardless of whether an anti-bullying policy was in place. The fact that policy appears to be “selective” in its helpfulness affirms previous research findings regarding the acceptability of harsher punishment for female offenses (e.g., Aday and Krabill, 2011).

We discuss the four-way interaction findings with the hope of stimulating more scholarly work and research in the area of policy implementation. Our initial results showcase male raters (persons of color) who (1) in the Policy scenario, rated Ed as more collegial than female (persons of color) counterparts; (2) rated Ed as more collegial when he reacted (than female persons of color counterparts), and (3) in the no policy condition rated Ed as more responsible for the bullying incident. It is possible that based on their history of discrimination, persons of color may be especially sensitive to attempts at “balancing the scales,” in the case of inequity. Davidson and Friedman (1998: 156) argue that “…minority group members (such as African-Americans), as well as others in traditionally less-powerful groups, might interpret accounts and react to injustices in ways that are systematically different from others.” Those who are consistently on the receiving end of unfair treatment may thus consider policies to eliminate it more beneficial.

An interesting line of future research could examine if hostile sexism displayed by men is greater regarding women of color (who are the recipients of both sexism and racism (Bell, 2004; Gregory, 2003)) than for white women. Glick and Fiske posit that the “…resentful tone evident in hostile sexism may be similar to prejudice directed toward socioeconomically successful minorities who are perceived as a competitive threat” (2001: 116). Researchers may consider examining the joint impact of hostile sexism and bullying on women of color to investigate whether any differences between that group and white women exist.

As an “exploratory study,” these findings are tentative and preliminary in nature. The aim of this manuscript was to examine a previously uninvestigated area (e.g., civility policy and the nexus of hostile sexism), to raise important points, and to provide a platform for future research. Despite the success of similar designs in previous studies (e.g., Gilbert and Stead, 1999; Heilman et al., 1992), this research did not yield the expected results in all instances (e.g., the dearth of main effects). An intriguing possibility is that Generation Z individuals (born between 1994 and 2004) may respond more positively to approaches that are better tailored to their habitual mode of learning. As those “born with an extra digital chromosome” (Liska, 2005):
“...they are able to acquire only short-term knowledge and do not manage to reach reflection because their brains are constantly overloaded by the digital lives they live” (Ivanova and Smrikarov, 2009). MacQuarrie (2011) argues that using videos instead of lectures will help to keep these generational learners more focused. A richer and more engaging presentation (consisting of a video enactment, as opposed to a paper and pencil scenario) may motivate students to do better work. Considering the sample demographic, some of our contradictory paper and pencil results may thus be the result of a cohort that is more accepting of visual instruction.

Qualitative results affirm that gender stereotypes are prevalent in workplace settings, and that the 1998 findings of Ragins et al. may still be true today. The prevalence of men at the organizational apex may set the stage for behavioral expectations across genders, solidifying stereotypical patterns of interaction. Women are still significantly underrepresented in major leadership positions in U.S. businesses, even though they earn more than half of the bachelor’s, master’s, and doctorate degrees awarded in the U.S. (National Center for Education Statistics, 2013). Although women occupy management positions, the elite (or top) positions are for the most part held by men. Notably, women represent 3.8% of Fortune 500 CEOs, hold only 16.6% of the Fortune 500 board seats, and 14.3% of the Fortune 500 executive officer positions (Catalyst, 2012). Opposing expectations (e.g., “masculine and tough,” but “not too manly”) for women may result in the perception that they are not suited to upper echelon spots within organizations (Eagly and Karau, 2002).

Relatedly, research suggests that a successful female garners some of the most vitriolic reactions, including envy and animosity (Cortina, 2008). Future inquiry could investigate if civility policies eliminate negative perceptions by varying the level of achievement among study “employees.” Under conditions of a more “civil” workplace, would there be no difference in the adjectives used to describe high performing women versus those that depict high performing men? Furthermore, are there other organizational and cultural characteristics or policies (e.g. leadership styles, decision-making processes, codes of ethics) that may prevent bullying in the workplace?

Research with larger sample sizes comprised of diverse employees could provide corroborative evidence with this study’s findings. The preliminary qualitative results represent a potentially promising line of research, as they provide an honest interpretation of how individuals feel on the job. Larger samples (in disparate regions of the country) could reveal if internalized sexism varies across hierarchical levels, or if regional differences exist.

Examination of civility is a necessary first step in influencing employee behavior. Identifying ramifications associated with bullying prevention (by enforcing a policy and/or defending a target) may thus help researchers and practitioners in constructing policy and understanding perceptions. Ultimately, continued analyses of the causes and consequences of uncivil actions can lead to fostering a more collegial work environment.
References


Workplace Bullying Institute (WBI). 2013. 25 States since 2003 have Introduced the HWB. Retrieved from http://www.healthyworkplacebill.org
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