ABSTRACT

YOSHIMURA, KARI EMI. Developing Technical Leaders in a Global Organization: Examining the Influence of Culture on Multi-Source Feedback and Performance. (Under the direction of Frank Smith).

This study examined performance change following multi-source feedback, a concept that has been addressed in a number of studies (e.g. Kluger & DeNisi, 1996) in a leadership development program. Archival data, from participants who received feedback as part of a leadership development program for technical employees, was used to re-examine the relationship between feedback and performance change and the impact of self and other (manager, colleagues, and subordinates) agreement on performance change. Self-other agreement was examined using polynomial regression and response surface methodology. The number of participants with pre- and post-program data differed across rating sources (ranging from N=166 to N=215).

This study also examined culture as a predictor of performance change. Culture was examined using dimensions proposed by Hofstede (1980) and as seven profiles which were identified using cluster analysis. Three hundred and thirty-four program participants completed a survey of culture values. The number of participants with both archival and culture data varied across rating sources (ranging from N=83 to N=133). Culture was also examined as a moderator of the relationship between self-other rating agreement and performance change.

Results suggest that the feedback does not result in uniform change across multiple performance dimensions. Further, changes in performance are not consistently viewed across rating sources. Results also suggest that the impact of culture on the

relationship between self-other agreement and performance change varies across performance dimensions and rating sources. Implications for these results and recommendations for further research are discussed.

Developing Technical Leaders in a Global Organization: Examining the Influence of Culture on Multi-Source Feedback and Performance

by
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DEDICATION

To my obachan, Fusayo Yoshimura and in loving memory of my grandparents, Sachiko and Takao Tanimoto, and Tsuneto Yoshimura.

BIOGRAPHY

Kari Yoshimura was born in Hilo, Hawaii to parents Arleen and Glenn Yoshimura. After graduating from Waiakea High School, she enrolled in the University of Washington where she intended to major in biology. After two years of chemistry, physics, and biology courses, she realized that she preferred the social sciences. She graduated with a Bachelors of Science in Psychology and a minor in Speech Communication.

In the fall of 2000, Kari entered the Industrial-Organizational Psychology graduate program at North Carolina State University in Raleigh. She received a Masters of Science in Psychology in 2003. Since then she has worked within the university as a teaching assistant and outside of the university as a research associate and a program manager. She is currently a leadership consultant at IBM.

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Introduction

Leadership is a popular area in both the research and application of Industrial/Organizational psychology. From the idea that leaders are born to the idea that leaders are made, I/O psychologists have sought to better understand leaders and leadership. Theories that strive to explain effective leaders and leadership abound. Leader effectiveness has been systematically studied using variables ranging from individual to situational. More recently, leadership development has also emerged as a field of interest (Lowe & Gardner, 2001).

For years, the topic of globalization has been described and discussed in the popular press. In 1996, Rhinesmith observed that "[g]lobalization has arrived in the world, but not in most of the world's organizations" (p. 3). More recently, Friedman (2005) declared that the "world is flat" in the title and pages of his best-selling book, one of many business and strategy books focusing on "going global" and the "borderless business."

Historically, multi-national organizations operated mini versions, replications, or silos of the parent company within each country, or operated separate international divisions within the company (Rhinesmith, 1996). Organizations now have the technology and infrastructure required to transform from being traditional multinational organizations into global organizations. As *The Economist* observed, the current trend is for a company to operate as a single, global organization ("Hungry Tiger, Dancing Elephant," 2007). This global organization is an organization that "shares resources on a global basis to access the best market with the highest quality product at the lowest cost" (Rhinesmith, 1996, p. 8).

It seems only natural that as businesses begin to operate in a global environment, the field of leadership goes global as well. This area of study may be of practical benefit to organizations because beyond economic and logistic challenges, globalization also poses a challenge to leader development. In order to compete globally, organizations need effective leaders and developing leaders globally has become both an emerging area in psychology (Avolio, Sosik, Jung, & Berson, 2003) and a business imperative (e.g. Weiss & Molinaro, 2005; Fulmer & Bleak, 2008).

As workers from emerging markets join the global pool of potential employees and as a company's workforce becomes more diverse, cultural differences may become an increasingly relevant issue. Increased interaction and communication across cultures represent an increase in cross-cultural interactions; however, Hofstede (2001) predicts that "electronic communication will not eliminate cultural differences, just as faster and easier travel has not reduced cultural rifts" (p. 453). With the shift from multi-national organizations to global organizations, cultural differences are becoming more important factors in understanding leadership and designing and delivering leadership development programs.

The use of multi-source feedback in organizations has increased over the years. It is estimated that 90% of Fortune 1000 companies use multi-source feedback as part of leader development (Atwater & Waldman, 1998). With such widespread use, the impact of culture on multi-source feedback becomes an increasingly relevant topic of investigation.

Another trend in recent years has been the changing nature of work. In this era of information technology or the "Infotech Age" (Colvin, 2000), organizations are moving away from manufacturing goods and towards providing services. In these organizations, intellectual property becomes more important than the actual products, and intellectual capital or knowledge held by the workers becomes more valuable than physical assets (Casio, 2003). Technology innovation and change are sources of competitive advantage and both are driven by a knowledge workforce.

Inspired by this changing environment, the general purpose of this study was to increase our understanding of the impact of multi-source feedback on performance in a culturally diverse sample of developing technical leaders. This study focused specifically on the relationship between multi-source feedback and performance. First, this study examined the change in leader performance after receiving multi-source feedback. Second, the relationship between self-other rating agreement and performance change was studied. Finally, this study examined the impact of culture on performance change. This study was not intended to evaluate the impact of a specific leadership development program or instructional design elements of a program.

Literature review

Leaders and leadership

Although the term "leader" existed for centuries before the term "leadership" (Bass, 1990), leader is often defined in terms of leadership and leadership in terms of leaders. For example, Northouse (2004) defined leadership as "a process whereby an individual

influences a group of individuals to achieve a common goal" (p. 3) and leaders as "people who engage in leadership" (p. 3). Hollander (1978) defined leadership as "a process of influence which involves an ongoing transaction between leaders and followers" (p. 12). Bass (1990) presented a more detailed explanation of leadership as a concept:

> Leadership has been conceived as the focus of group processes, as a matter of personality, as a matter of inducing compliance, as the exercise of influence, as particular behaviors, as a form of persuasion, as a power relation, as an instrument to achieve goals, as an effect of interaction, as a differentiated role, as initiation of structure, and as many combinations of these definitions. (p. 11)

In this study, leadership was defined as "the process of influencing others to understand and agree about what needs to be done and how it can be done effectively, and the process of facilitating individual and collective efforts to accomplish the shared objectives" (Yukl, 2002, p. 7).

Another area of complexity is the relationship between leaders and managers. Bennis and Nanus (1985) explained the difference between the two as "managers are people who do things right, leaders are people who do the right thing" (p. 21). Daft (1999) suggested that managers focus on details while leaders focus on the strategy. As Yukl (2002) observed though, the controversy is not about whether leaders and managers are equivalent, but the extent to which the two overlap and "success as a manager or administrator in modern organizations necessarily involves leading" (p. 6). For the purposes of this study, managers

and leaders were not treated as separate roles and anyone who demonstrated leadership was considered to be a leader.

Leader roles

Past leadership studies have examined leaders in a number of positions. Business leaders with executive titles such as President or Vice President as well as Chief Executives or "CXO" titles such as Chief Executive Officer and Chief Financial Officer have been studied extensively. In the past, leadership may have focused on the executives of the company; however, for companies to remain competitive in today's environment, they must look to develop leaders at all levels of the organization (White, Hodgson, & Crainer, 1996).

Elkins and Keller (2003) suggested that leadership in research and development (R&D) organizations is different from leadership in more traditional operational organizations because of the rate of technological change the organization must manage and also because of the membership of the leader as part of the project group and not a separate management team. These differences were reflected in a study of R&D team leadership by Kim, Min, and Cha (1999). They identified and examined five different roles played within the R&D team leader job (strategic planner, team builder, gatekeeper, technical expert, and champion) and found that all roles but champion were related to team performance.

Current research on R&D leadership has primarily focused on R&D management and innovation management; however, a different technical leader role has also emerged. In many cases, these roles were introduced as an alternative to the management career path and in recognition of technical and leadership contributions. These leadership roles, often

executive level positions, allow technical employees to focus on leading in areas of research, development, engineering or other technological aspects of the organization rather than on managing employees or on managing the business. The formal titles for these technical leaders differ across companies, for example at Boeing they are called Senior Technical Fellows, Microsoft has Technical Fellows and Distinguished Engineers, IBM has Fellows and Distinguished Engineers, and Google has Google Fellows. Despite the different titles, technical leaders are often promoted through the technical ranks based on their technical expertise, without formal management training (Vieth & Smith, 2008).

Leadership theories

Trait theories. The trait approach is the most simplistic approach because it focuses solely on the leader and on identifying individual differences related to leadership. It does not consider the subordinates or the context in which the leader leads.

Early research by Mann (1959) and Stogdill (1948) identified intelligence and dominance as traits related to leadership. More recently, Atwater, Dione, Avolio, Camobreco, and Lau (1999) found early measures of individual differences, specifically cognitive ability, physical fitness, prior influence experience, and self-esteem, predicted leader emergence and effectiveness in male cadets.

The main criticism of this approach is that it is not conducive to training and development (Northouse, 2004). This approach implies that leaders are “born” or that traits are stable attributes neither of which is impacted by leader development.

Behavioral theories. The behavioral or style approach expands the scope of leadership theories beyond leader traits to include the behaviors the leader demonstrated and the impact those behaviors had on groups of followers. It focuses on what leaders do and how they behave when leading groups.

In the 1940s, researchers at Ohio State University and the University of Michigan conducted independent studies of leader behavior. Ohio State researchers created a 150 item survey called the Leader Behavior Description Questionnaire to assess behaviors exhibited by leaders (Hemphill & Coons, 1957). University of Michigan researchers focused their investigation on the relationship between leader behavior and group performance (Katz & Kahn, 1951). Both studies identified two groups of leadership behaviors. The first group of behaviors represented task behaviors, called initiating structure and production orientation by the Ohio State and Michigan studies accordingly. The second group of behaviors represented relationship behaviors, labeled consideration by Ohio State researchers and employee orientation by the Michigan researchers.

In a recent meta-analysis, Judge, Piccolo, and Ilies (2004) found support for the validity of the initiating structure and consideration constructs. The results showed that initiating structure had a stronger relationship with performance of the group and organization and of the leader on the job and consideration was more strongly related to follower satisfaction, motivation and leader effectiveness.

This approach is conducive to leader development because behaviors can be learned or modified through training and practice. Once effective leader behaviors are identified, a behavioral framework can be created to provide guidance for leader development.

Contingency theories. These theories consider both leader behavior and followers and further expand the scope of leadership theories by considering the situation as well. One common characteristic across contingency theories is that leader effectiveness is contingent on matching the situation, follower characteristics, and leader behavior.

Contingency theory: Fiedler (1967) proposed that leaders are consistent and that effective leadership was a result of selecting the right leader for a given situation.

Path-goal theory: Initially proposed by Evans (1970), the most well-known version of this theory was developed by House and Dessler (1974). They identified four leader behaviors, two follower variables, and three situational characteristics that could be studied to explain leader effectiveness. Research on this theory has resulted in mixed empirical support.

Situational leadership theory: Hersey and Blanchard (1969) proposed a theory to explain the inconsistent relationship between behavior categories and leadership success. According to this theory, leader effectiveness will vary across situations. While this model may make intuitive sense, it has received little empirical support.

These theories assume that leader effectiveness is not just dependent on how the leader behaves, but also on the appropriateness of the behavior in a given situation. Based on these theories, leader development should focus on training leaders to understand their

environments and determine which behaviors are appropriate and effective given their followers and the situation.

Transformational theories. This approach has been called "neocharismatic" (Lowe & Gardner, 2001), the "new leadership school" (Antonakis, Cianciolo, & Sternberg, 2004), and "new paradigm" (Bryman, 1992). It includes theories that build on previous approaches by adding a "transformational" aspect to leadership. This approach studies the shared vision, mission, or sense of purpose the leader creates for the group and the inspiration the leader provides for the group.

The term "transformational" was first used in 1973 by Downton; however, the emergence of this approach is a result of the work of House (1976) on charismatic leadership and the work of Burns (1978) to differentiate transactional from transformational leadership (Northouse, 2004). Burns (1978) made a compelling argument that all previous approaches to leadership were transactional in nature; that is, they focused solely on the exchanges between leader and follower. Transformational and charismatic leadership are often used synonymously; however, Northouse (2004) suggested that they are not interchangeable and transformational leadership often involves charismatic leadership.

In a review of eight transformational leadership approaches, Sashkin (2004) identified three factors common to all approaches: leader traits, leader behavior, and situational context of leadership. He further identified common leader behaviors across the approaches such as communicating a vision and showing respect for followers, and common personal traits such as power and self-confidence.

Building on this concept, Bass (1985, 1997) developed a theory of transformational and transactional leadership. This theory incorporated previous, more traditional approaches with the newer transformational approaches.

Transformational approaches have been criticized for being ambiguous, being mostly based on qualitative data, and for positioning leadership as a personality trait (Northouse, 2004). Despite these criticisms, empirical research has found support for transformational leadership (e.g. Church & Waclawski, 1999; Judge & Piccolo, 2004).

Impact of leadership

The continued focus on leadership in both research and practice indicates that leaders are an important component of organizational success. While intuitively this assumption may seem valid, several researchers have examined the relationship more systematically. Hogan, Curphy, and Hogan (1994) examined leader characteristics associated with team performance, negative consequences of leadership, and the perceptions of followers to determine whether or not leadership mattered. They concluded that indeed it did. More recently, Kaiser, Hogan, and Craig (2008) reviewed the leadership literature and came to the conclusion that leaders strongly influenced organizational outcomes.

Leader development

Just as leader and leadership have different meanings, so do leader development and leadership development. The Center for Creative Leadership differentiates these two terms based on whether the development is focused on the individual or on the organization. Leader development is “the expansion of a person’s capacity to be effective in leadership

roles and processes" (Van Velsor & McCauley, 2004, p. 2) while leadership development is "the expansion of the organization's capacity to enact the basic leadership tasks needed for collective work: setting direction, creating alignment, and maintaining commitment" (Van Velsor & McCauley, 2004, p. 18). Given these definitions, leader development focuses on individual capability, while leadership development focuses on the organizational capability.

Leader development differs from manager development based on the intended outcomes of each. While managers are prepared for positions of formal authority, leaders are prepared for positions where they must influence with or without formal authority. Day (2001) proposed that manager development focuses on helping managers acquire the specific knowledge, skills, and abilities need to enhance their performance on known tasks and roles while leader development focuses on developing capabilities to help leaders address problems that cannot be predicted.

Kaiser and Craig (2004) found that leader effectiveness was associated with different behavior patterns at the bottom, middle, and top leadership levels. This suggests that leaders must learn new behaviors in order to be successful at the different levels of leadership. Development programs can play a key role in helping employees make the transition into leadership and help leaders prepare for the transition to higher levels in the organization.

Kates and Downey (2005) describe the transition from middle management into executive leadership positions as a "chasm." For technology and engineering workers, the transition into leadership may be even more pronounced. The engineering literature suggests that engineers may not be aware of or prepared for this transition. Jablokow (2007) suggests

that engineers must realize that they "must know more than engineering in order to be good engineers" (p. 30) and Florman (1996) states that "the vital first step is to convince engineering students that technical brilliance is not enough" (p. 67).

The role of training in leader development has been the focus of several studies. For example, Hirst, Mann, Bain, Pirola-Merlo, and Richver (2004) examined the impact of leader learning on facilitative leadership. Their study found a positive relationship between leader learning and the demonstration of facilitative leadership behaviors. Conger (1992) participated in and evaluated leader development programs and concluded that training which include skill building, conceptual development, personal growth, and formal feedback "can play a vital role in leadership development" (p. 34).

In a review of leadership literature, Avolio et al. (2003) found collective support that leaders and leadership can be developed over time, either on the job or through training. Collins and Holton (2004) conducted a meta-analysis of studies of leader and manager development programs and concluded that leader knowledge and skills could be improved through training if the leader is matched with the appropriate development program.

Organizations accept that leaders can be developed as evidenced by the time and money invested by the company in the development of their leaders. In a *Training* survey, almost one third of the companies reported spending 25% or more of their training budgets on leader development (Delahoussaye, 2001). In 2007, US companies spent over $130 billion on employee learning and development, 16% of which was invested in executive, supervisor, and management development (Paradise, 2008).

Performance change

Organizations invest in the training and development of their leaders with the expectation that these leaders will improve their performance or increase their effectiveness. This is based on the assumption that training or development will result in performance change.

Conceptualization of change. In leader development, the impact of development interventions can be seen in two types of change (Van Velsor & McCauley, 2004). The first type is a change in self-other rating congruence, that is, a change in the agreement between self and other from Time 1 to Time 2. Church (1997) defined managerial self-awareness as the congruence between self and subordinate behavioral ratings and suggested that agreement is a proxy for self-awareness (Church, 2000). The second type of change reflects a change in an individual's behaviors or performance. Positive change represents an improvement in performance while a negative change indicates a decrease in performance.

Measuring change. There are several challenges to measuring change. Smither and Walker (2001) identify three primary issues: regression to the mean, ceiling effect, and response shift bias. Regression to the mean indicates that extreme scores (those that are extremely high or low) at time 1 will regress to be closer to the mean at time 2. As such, scores at time 1 and time 2 will be different, but these differences are due to statistical regression and not actual differences in behaviors.

High ratings or scores are at risk of the ceiling effect. Participants receiving high ratings at time 1 may show improvement at time 2; however because the initial ratings were

so high, ratings at time 2 may not accurately reflect this improvement. The ceiling effect is an issue because it may conceal true changes in behavior.

Response shift bias refers to rating changes that are due to factors other than actual behavior change. When comparing time 1 and time 2 ratings, any differences between the ratings may be due to actual behavior change (alpha change), changes in rating scale calibration (beta change) or changes in the conceptualization of the construct (gamma change) (Golembiewski, Billingsley, & Yeager, 1976). Differences due to beta change represent differences in ratings due to differences in the scales at time 1 and time 2 being. Differences due to gamma change can be attributed to different constructs being measured at time 1 and time 2. With both beta and gamma change, differences in ratings are not due to actual changes in behaviors.

Retrospective methods have been proposed as a solution to these problems. Rather than using repeated measures, raters are asked to rate past performance and current performance at the same time. As the method title suggests, past performance is rated retrospectively. This ensures that the scale and constructs used for past and current performance are the same, hence avoiding beta and gamma change. Unfortunately, most organizations do not use this method, perhaps due to the fact that each item must be rated twice (Smither & Walker, 2001).

Approaches to leader development

Competencies. In recent years, competency-based approaches have received increased attention in human resource practices, including leader development (e.g. Bellingham & O'Brien, 2005; Berke, Kossler, & Wakefield, 2008; Bryne & Rees, 2006). Parry (1996) presents a definition of competency based on the suggestions made by participants at a 1995 conference focused on competencies:

> A cluster of related knowledge, skills and attitudes (K, S, A) that affects a major part of one's job (a role or responsibility), that correlates with performance on the job, that can be measured against well-accepted standards, and that can be improved via training and development (p. 50).

Lucia and Lepsinger (1999) suggest that training and development may benefit from competency models in several ways. First, competency models focus on the skills, knowledge, and characteristics that have the most impact on effectiveness. Second, the model can be used to ensure training and development aligns with the strategy and values of the organization. Finally, a competency model provides a framework that may be used for coaching and feedback.

Many companies use corporate competency models as part of their leader development. Competencies such as leading employees, building/mending relationships, risk-taking/innovation, and change management are commonly identified as important competencies by organizations (Gentry & Leslie, 2007). Despite the presence of competency models, many organizations do not appraise competencies as part of their performance

appraisal system (Abraham, Karns, Shaw, & Mena, 2001), suggesting that companies may use competency models primarily for development.

Despite the popularity of competency models, their use is still a much debated topic (e.g. Hollenbeck et al., 2006). The main criticism of competency models is the fact that these models are not based on theory. McCall and Hollenbeck (2007) also criticize competencies for being ambiguous and disconnected from tangible results. The Society for Industrial and Organizational Psychology commissioned a study to compare competencies with job analysis and the committee concluded that job analysis was a more rigorous procedure on all criteria except one, linking to business goals and strategies (Shippman et al. 2000).

Developmental activities. Organizations use a number of methods to develop their leaders. These methods can be deployed as part of intervention programs or as individual activities. Leaders may take responsibility for portions of their personal development through self-study activities such as reading a book or participating in self-paced learning through a number of delivery methods (e.g. on-line, podcasts). Executive coaching may also help leaders develop by providing one-on-one goal-specific learning. Leaders also develop through formal and informal mentoring relationships. In these developmental relationships, mentors may provide advice and share their perspectives and experiences. Developmental experiences such as job activities, stretch assignments, and job rotations provide leaders with opportunities to actively learn.

Performance feedback is an important part of leader development because it allows individuals to learn from their past behaviors and experiences, which contributes to their

development as leaders (Bass, 1990). In organizations, multi-source feedback is used for both administrative and developmental purposes. Administrative uses include decisions such as promotion and compensation, while developmental uses include activities such as training and coaching. Research has shown more positive performance gains when feedback is used for developmental purposes only (Smither, London, & Reilly, 2005). Additionally, feedback should focus on observable behaviors and not on an individual's personality, motivation, or intention (Bass, 1990).

Multi-source feedback

The terms 360 degree feedback and multi-source feedback may seem interchangeable; however, 360 degree feedback is actually a specific type of multi-source feedback. Multi-source feedback refers to evaluations gathered about a target participant from two or more rating sources including self, supervisors, peer, subordinates, internal customers, external customers, vendors and suppliers (Dalessio, 1998). With the exception of self, the other sources are comprised of groups of individual raters. The different sources may have different opportunities to observe the individual's performance. They may also have different types of interactions with the individual. For example, working for someone as a subordinate may be different than working with her as a colleague, interacting with someone as a client, will be different than interacting with him as his manager. Hogan et al. (1994) suggest that although each source provides feedback on different aspects of the individual's overall performance, the sources may provide similar evaluations of an individual.

Previous studies have examined the relationship of ratings from different sources. In a meta-analysis of ratings, Harris and Schaubroeck (1988) found modest correlations between rating sources. In a more recent study, Facteau and Craig (2001) used confirmatory factor analysis and item response theory to show measurement invariance across rating groups. Their findings suggest that ratings from the different sources in their study (self, peer, supervisor, subordinate) are comparable.

Self-other agreement, disagreement, congruence, discrepancy

In the past, a number of researchers have studied the relationship between self and other ratings. These relationships have been termed agreement (e.g. Atwater & Yammarino, 1992), congruence (e.g. Church, 1997), disagreement (e.g. Cheung, 1999), and discrepancy (e.g. Kulas & Finkelstein, 2007; Sala, 2003). These terms offer different perspectives on the same concept, that is, how an individual's self ratings compare with ratings provided by other sources.

In addition to studying the relationship between self ratings and ratings by others, research has also been conducted to better understand the factors that may impact that relationship. For example, Furnham and Stringfield (1998) found higher congruence on observable behaviors than on cognitive variables. Gender (Patiar & Mia, 2008) and personality (Goffin & Anderson, 2007) were also found to influence self-other congruence.

Conceptualization of agreement

The conceptualization of agreement has changed over time. Initially, difference scores were used to measure agreement. These scores were calculated as the absolute

difference between the self and other ratings or as the square root of the sum of squares (absolute) difference between self and other for each item divided by the number of items (Edwards, 1994).

Researchers then studied the direction of the difference score. Atwater and Yammarino (1992) classified subjects into three categories: over-estimation (self ratings were higher than other ratings), under-estimation (self ratings were lower than other ratings), and agreement. They found that magnitudes of correlations varied as a function of agreement category and correlation between behavior and performance was highest for those in the "agreement" category. Looking at the patterns of the different categories, they found that over-estimation was not solely due to high self-ratings, as others rated those participants lower than those in other categories.

Expanding on these categories, Yammarino and Atwater (1997) proposed a typology of four types of self-other agreement. In addition to over-estimators and under-estimators, they separated agreement into two categories: in agreement/good (self and other ratings are equal and indicate good performance) and in agreement/bad (self and other ratings are equal and indicate poor performance).

Brutus, Fleenor, and Taylor (1996) expanded on this typology by separating over-estimators and under-estimators groups into over-estimator/good, over-estimator/bad, under-estimator/good and under-estimator/bad. Fleenor, McCauley, and Brutus (1996) found that the six category model accounted for more variance in leader effectiveness than the four category model. They also found that groups did not differ when the level of performance

was controlled. The research by Brutus et al. (1996) and Fleenor et al. (1996) suggests that self-other agreement taken as a category is not helpful in explaining individual performance.

Later research by Atwater, Ostroff, Yammarino, and Fleenor (1998) suggests that the relationship between self ratings and other ratings is more complex than previously conceptualized. Using an approach recommended by Edwards and Parry (1993), they used polynomial regression to study the relationship between both the direction and magnitude of self and other ratings simultaneously. This conceptualization resulted in their conclusion that self and other ratings were helpful in understanding individual performance.

Ostroff, Atwater, and Feinberg (2004) also used polynomial regression to study self-other agreement and found biographic differences in agreement. Their results show gender, age, and race differences in agreement and overrating. Specifically, managers who were white, younger, or who had higher education, were more likely to show self-other agreement. Conversely, managers who were male, non-white, older, or who had lower education levels tended to be over-raters. These findings suggest that individual variables may impact self-other agreement.

Impact of feedback on performance

The use of feedback in leader development programs is based on several assumptions. The basic assumption is that a participant's awareness of how his or her behaviors are viewed by others is a key component to leader effectiveness (Tornow, 1993). Another assumption is that comparing data about a participant's behaviors with his or her self perceptions leads to increased self-awareness and behavioral change (Church, 2000). It is also based on the belief

that participants will be motivated to change their self-perceptions and improve their performances when confronted with self-other rating discrepancies (Tornow 1993).

Research on the actual impact of feedback on performance has found mixed results. Smither et al. (1995) examined the effects of an upward feedback program over time and found that changes in performance varied as a function of managers' initial ratings. They found that managers with initial low or moderate ratings improved by the follow-up survey beyond what would be expected from regression to the mean. On the contrary, performance ratings declined for managers with high initial ratings.

Research by Atwater, Roush, and Fischthal (1995) studied the influence of upward feedback on self and follower ratings. They found that leaders receiving negative feedback had lower self-evaluations following feedback while follower ratings went up following feedback. They also found leaders with positive feedback had higher self-evaluations following feedback, while there was no change in follower ratings.

In their review of performance feedback, Balcazar, Hopkins, and Suarez (1986) concluded that feedback did not uniformly improve performance. They also found that performance improvement becomes more consistent with the addition of rewards or goal-setting. In a later meta-analysis, Kluger and DeNisi (1996) found feedback interventions resulted in lower performance in 20% of the studies included. Smither, London, and Reilly (2005) cautioned practitioners that drastic performance improvement after receiving feedback should not be expected.

More recently, Craig and Hannum (2006) reviewed the 360-degree performance assessment literature and found support for the idea that performance improvement is dependent on complex relationships among factors. In addition to self-other agreement or discrepancy, these factors may include individual differences, reactions to the feedback, and follow-up activities.

Additional variables impacting the relationship between feedback and performance

Previous research suggests that additional factors may influence the relationship between feedback and performance improvement. For example, Brutus, London, and Martineau (1999) found that while multi-source feedback contributed to the selection of developmental goals, the source of the feedback was also important. They found that contrary to their hypothesis, subordinate feedback, not supervisor feedback, had the greatest influence on goal selection.

Brett and Atwater (2001) studied the relationship between self-other discrepancy and participants' reactions to feedback and found that less favorable feedback was associated with negative reactions toward the feedback, and perceptions that the feedback was less accurate. They also found that negative reactions and perceptions of decreased accuracy were associated with beliefs that the feedback was less useful. Those believing the feedback to be less useful were also judged less developmentally-focused by facilitators.

Researchers have also studied participant reactions to explain the variance in performance improvement after receiving feedback. In a review of early research, Ilgen, Fisher, and Taylor (1979) found that the sign of feedback and recipient characteristics

influenced reactions to feedback. More recently, Sargeant, Mann, Sinclair, Van Der Vleuten, and Metsemakers (2008) studied the relationship between emotion, reflection, and performance. They found a link between emotional response to the feedback and internal comparison of feedback by participants with self-perceptions of performance. Specifically, they found that participants who agreed with the feedback responded positively, those who disagreed with the feedback responded with distress. The researchers suggested that negative feedback may evoke negative emotions which may interfere with acceptance.

Researchers have also examined the role participant intentions have on performance change. Maurer, Mitchell, and Godsey (1996) found that behavioral intentions to improve and develop following 360 feedback were directly related to attitudes toward development, perceived emphasis and support for development, and self confidence for development (as cited in Maurer & Palmer, 1999). Boswell and Baudreau (2002) found that the use of feedback, either for evaluation or for evaluation and development, impacted intent to use development in the future. Research also suggests that perceived accuracy of ratings are not related to intentions to change (Maurer & Palmer, 1999).

Another body of research has looked at follow-up or additional activities to explain differences in performance change over time. Follow-up activities such as coaching are proposed to increase the effectiveness of multi-source feedback (Day, 2001). Goldsmith and Underhill (2001) suggested that follow-ups increase leader effectiveness because they transform multi-source feedback from a single intervention (receiving the feedback) to a continuous process (receiving on-going feedback).

Past research has also examined the relationship between individual differences and performance improvement. Fedor, Davis, Maslyn, and Mathieson (2001) studied the impact of self-esteem and source power on the relationship between negative feedback and performance improvements. They found that referent power moderated the relationship between self-esteem and both recalled and intended performance improvement.

Smither, London, and Richmond (2005) studied the relationship between participant personality and reactions to and use of multi-source feedback. These researchers found that participants generally thought the feedback they received was valuable. Participants also felt accountable to use the feedback they received. Researchers found that personality was related to being open and motivated to use feedback. More specifically, they found support that emotional stability predicted openness to feedback and that agreeableness and responsibility (a component of the conscientiousness personality factor) were positively related to how accountable a leader felt to use the feedback. Finally, they found that responsibility was positively related to participating in developmental behaviors.

Bailey and Austin (2006) studied self-efficacy as a moderator of feedback and changes in self-assessment. They found that the relationships between peer and manager ratings and changes in self-assessment were stronger for those with high self-efficacy.

Culture values have not yet been examined in this context. According to Triandis (1995) culture specifies what things are noticed and also provides a language for labeling experiences. In this way, culture influences the way people process information. As such, the

current study investigated the relationship between cultural values and performance improvement.

Culture

Many definitions of culture have been published. The most quoted definition, by Hofstede (2001), defined culture as "the collective programming of the mind that distinguishes the members of one group or category of people from another" (p. 9). Culture has also been described as "shared motives, values, beliefs, identities, and interpretations or meanings of significant events that result from common experiences of members of collectives and are transmitted across age generations." (House et al., 2004, p. 15). In general, culture refers to the learned values and behaviors that characterize the way of life for members within a given society (Hughes, Ginnet, & Curphy, 1999). Consequently, this study adopted a values view of culture to avoid issues associated with traditional operationalizations of culture as country-level or society-level scores that ignored the variance within each culture.

Types of cultural studies

Past studies have approached culture from several perspectives. One classification used in cross-cultural research is emic or etic. This classification originated in the field of linguistics and was later adopted in the field of anthropology. Emic refers to first order concepts while etic refers to second order concepts (Schwandt, 2007). In cross-cultural psychology, the terms have been adapted to refer to cultural relevance. Emic studies focus on

concepts that are relevant to a specific society while etic studies investigate concepts that may not be relevant to any specific society (Hunt & Peterson, 1997).

Some studies have taken a single culture/single country approach, others a multi-culture/multi-country, while still others studied cultural diversity within a single group. These studies have sought to better understand the dimensions of culture, the impact of culture or the differences and similarities between cultures.

This study deviated from traditional approaches in that it sought neither to better understand a specific group, country, or culture, nor to compare groups from different countries or cultures. Instead, this study explored the impact of individually held cultural values in a global workforce. This approach was supported by the observation made by Hermans and Kempen (2000) that "[i]n an increasingly interconnected world society, the conception of independent, coherent, and stable cultures becomes increasingly irrelevant" (p. 1111).

Culture frameworks and research

Cultural frameworks have been proposed by Hofstede (1980), Schwartz (1999) and Bond et al. (2004) among others. These frameworks consist of as few as two (e.g. Inglehart, 1997; Bond et al., 2004) to as many as nine dimensions (House et al., 2004). Of these, Hofstede's cultural model is one of the most widely used in psychology. Based on a global database of IBM attitude surveys from 116,000 employees in 72 countries, he identified four dimensions on which cultures differed (Hofstede, 2001). These dimensions were individualism/collectivism, uncertainty avoidance, power distance, and

masculinity/femininity. Each dimension will be reviewed further in the next section. Hofstede (2001) later added long and short-term orientation as a fifth dimension.

In 1988, Bond presented culture dimensions which he identified through studies conducted on the Chinese Value Survey (CVS) and the Rokeach Value Survey (RVS). These surveys were administered in 21 and 9 cultures respectively. Analyses of survey responses suggested that the CVS measured two culture dimensions (Social Integration vs. Cultural Inwardness and Reputation versus Social Morality) and the RVS measured four dimensions (Social Reliability versus Beauty, Competence versus Security, Personal Morality versus Success, Political Harmony versus Personal Sociability). Only one factor from the CVS (Reputation versus Social Morality) was found to highly correlate with a factor identified from the RVS (Social Reliability versus Beauty).

Schwartz (1999) studied culture by examining individual value priorities which he described as "a product both of shared culture and of unique personal experience" (p.25). He theorized that cultures could be compared using seven value types. He further proposed that these seven value types were organized on three dimensions. The first dimension contained three value types: Conservatism versus Intellectual Autonomy and Affective Autonomy. The second dimension consisted of Hierarchy versus Egalitarianism. Mastery versus Harmony made up the third dimension. Using the Schwartz Value Survey, he collected data from 49 countries to validate his proposed framework.

Another approach to understanding culture is the use of social axioms. Leung et al. (2002) defined social axioms as "generalized beliefs about oneself, the social and physical

environment, or the spiritual world, and are in the form of an assertion about the relationship between two entities of concepts" (p. 289). Social axioms are generally held beliefs that can compliment value-based cultural dimension (Bond et al., 2004). Using the Social Axiom Survey (SAS), Leung et al. (2002) found support for five social axioms. These social axioms are Cynicism, Social Complexity, Reward for Application, Spirituality, and Fate Control. Building on this work, Bond et al. (2004) analyzed the SAS data and identified two cultural dimensions: Dynamic Externality and Societal Cynicism.

The GLOBE study focused on furthering the understanding of leadership in the context of culture and the "identification of leadership styles associated with different cultural patterns" (p. xvii, Triandis, 2004). As part of the GLOBE study, House et al. (2004) developed a culture framework of leadership values. This study examined leadership and culture from a multi-culture perspective rather than the single-culture, single-country perspective often used in the past. This framework consisted of nine cultural dimensions which were explored at the societal and the organizational levels. These dimensions were Institutional Collectivism, Uncertainty Avoidance, Power Distance, Gender Egalitarianism, In-Group Collectivism, Performance Orientation, Humane Orientation, Future Orientation, and Assertiveness. Comprehensive literature reviews on these dimensions were conducted as part of that study (see House et al., 2004).

In addition to cultural dimensions, researchers and scholars have also identified culture-specific aspects. Examples of these include "wa" in Japanese culture, "guanxi" in Chinese culture, and "inhwa" in Korean culture (Alston, 1989). "Wa" refers to the value

placed on group loyalty and the commitment individuals' have to achieving group goals, "guanxi" refers to a relationship between two people that is based on favor exchanges, and "inhwa" refers to the value of harmony among people, regardless of their status (Alston, 1989). These terms have no direct English translation and are not universally endorsed. They describe particular aspects or norms of a specific culture.

The current study expanded research on the impact of culture on leadership by exploring it in the context of leadership development. Based on the prominence of Hofstede's framework in the existing research on culture, this study utilized Hofstede's dimensions. This framework was also selected because it was developed from a global sample and was not intended to be country- or culture-specific.

Hofstede's culture dimensions

Individualism/collectivism. The individualism/collectivism dimension is the most frequently studied cultural dimension in organizational research (Tsui, Nifadkar, & Ou, 2007). It refers to the strength of the ties between individuals in a group. People in individualistic cultures have looser ties to each other and value the needs or interests of the individual above those of the group. Those in collectivist cultures have stronger and closer ties to the group and value the needs or interests of the group first. Triandis, Leung, Villareal, and Clark (1985) studied individualism and collectivism at the individual level. They call these values idiocentrism (individualism) and allocentrism (collectivism). Examples of individualistic cultures include the United States, Australia, and Great Britain, while Guatemala, Ecuador, and Panama are examples of collectivist cultures (Hofstede, 2001).

Past research on individualism and collectivism found cross-cultural differences in communication methods and styles. Holtgraves (1997) found differences in communication methods used in individualist and collectivist cultures. Participants from collectivist cultures use face-saving and indirect communication while individualist cultures use more direct, straight-forward communication. These differences may suggest that cultural values impact the way individuals respond to feedback and the feedback method.

Individualism and collectivism were also found to impact performance appraisal. Ramamoorthy and Carrol (1998) studied the relationship between individualism and collectivism orientations and reactions toward Human Resource management systems. They found that higher collectivism negatively related with attitudes toward a formal individual performance appraisal system.

Individualist cultures and collectivist cultures may also differ in rating patterns. In their study of participants from Japan and the United States, Kitayama, Markus, Matsumoto, and Norasakkunkit (1997) found that Americans were more likely to self-enhance while Japanese were more likely to self-criticize. Research by Kosgaard, Meglino, and Lester (2004) found that participants who were high in other-orientation (high in collectivism) exhibited less self-enhancement in their self-ratings, higher agreement with supervisors and were less lenient than supervisors as compared to participants low in other-orientation (high in individualism).

Members of individualistic and collectivistic cultures may seek different types of feedback. In a study of feedback, Bailey, Chen, and Dou (1997) found that members of

individualistic cultures expressed a stronger desire for feedback on success while those from collectivist cultures wanted more information on failures.

In addition to conducting research studies, authors have also proposed theories about the relationship between individualism and collectivism with the emphasis placed on individual or group performance and rewards (Davis, 1998; Milliman et al., 1998). Milliman et al. (1998) hypothesize that individualistic cultures deal more directly with conflicts in performance appraisal and supervisors in those cultures provide more constructive and specific feedback on work-related performance using an impersonal approach. They suggest collectivist cultures deal indirectly with performance appraisal conflicts and supervisors in these cultures provide more relationship-oriented feedback using a more personal approach. While these hypotheses are insightful, they have yet to be tested.

Power distance. Power distance is the second most studied Hofstede dimension (Tsui et al., 2007). It refers to the extent to which individuals accept that power is unequally distributed. For example, in a high power distance culture, there is a clear hierarchy and supervisors and subordinates do not see themselves as equals. In a low power distance culture, there is a greater sense of equality regardless of organization position. Countries such as Malaysia, Guatemala, and Panama were found to be high in power distance while Austria, Israel, and Denmark were low (Hofstede, 2001).

Research by Shipper, Kincaid, Rotondo, and Hoffman (2003) suggests that different leadership skills may be important in high versus low power distance cultures. For example, interactive skills such as problem-solving, planning, training, and coaching may be more

important in low power distance cultures while controlling skills such as keeping to a schedule, ensuring goals are met and managing details are more important in high power distance cultures.

Research also found differences in leader behavior in high versus low power distance cultures. Offermann and Hellmann (1997) found power distance to be significantly associated with communication, delegation, approach, and team building behaviors across 39 cultures. In a study of 10 cultures, managers high in power distance were found to be less likely to provide employees with job enrichment and empowerment (Aycan et al., 2000). Smith, Dugan, Peterson, and Leung (1998) looked at participants from 23 countries and found that power distance predicted both the frequency of disagreements and how those disagreements were handled. They found that disagreements with other groups or departments was more often handled with the help of peers and disagreements within a group or department was more often handled through subordinates as opposed to superiors in low power distance culture more so than in high power distance cultures.

Several scholars have hypothesized that power distance influences performance appraisal. Milliman et al. (1998) proposed that subordinates in low power distance cultures would be more likely to openly express their views in an appraisal review. They also suggested that in low power distance cultures, subordinates will have more of a responsibility to improve his or her performance as part of the appraisal process; however, no studies have been conducted to test this proposition.

Power distance values may also influence leader reactions to feedback. Individuals from high power distance cultures may accept feedback from superiors, but may be less receptive to feedback from subordinates. Ryan, Brutus, Greguras, and Hakel (2000) found that items related to feedback from supervisors were viewed as negative rather than positive behaviors in high power distance cultures.

Finally, Davis (1998) proposed that power distance may constrain the choices of appropriate rater. For example, selecting a subordinate as a rater may not be appropriate in high power distance cultures. No studies have been conducted to test this hypothesis.

In addition to studying single culture dimensions, cross-cultural research has also simultaneously considered both the power distance and individualism/collectivism dimensions of cultures. Research suggests that these dimensions may impact recipient reactions to feedback. Bond, Wan, Leung, and Giacolone (1985) found differences in the way participants from a collectivist and high power distance culture (Hong Kong) and those from an individualist and low power distance culture (United States) responded to insults. Findings suggest that insulter status was more important to Hong Kong participants. These participants were less likely to evaluate the insulter negatively if the insulter was of a higher status. Extending these findings to performance feedback, it would be expected that participants in collectivist and high power distance cultures would respond less negatively to negative feedback.

Uncertainty avoidance. Uncertainty avoidance refers to the extent to which members of a culture avoid uncertainty and feel uncomfortable in ambiguous situations. Cultures high

in uncertainty avoidance include Greece, Portugal, and Guatemala, while Singapore, Jamaica, and Denmark are low in uncertainty avoidance (Hofstede, 2001).

Previous research found differences in leader behavior in cultures with high as compared to low levels of uncertainty avoidance. For example, Offermann and Hellmann (1997) found uncertainty avoidance to be associated with more leader control and less delegation and approachability. Ergeneli, Gohar, and Temirbekova (2007) found a negative relationship between uncertainty avoidance and transformational leadership.

Research by Bjerke (1999) found a relationship between uncertainty avoidance and attitude to change (stability versus change). He found that cultures varied on the two dimensions and each quadrant differed in terms of how change was perceived. In cultures that were high in uncertainty avoidance with a preference for stability, change was controlled and structured. In low uncertainty avoidance cultures where change was preferred, change was more organic and unstructured. Cultures which were low in uncertainty avoidance and which preferred stability had change occur as part of a network. In cultures which were high in uncertainty avoidance and where change was preferred, change occurred in carefully planned and controlled steps. Taken together, this suggests that uncertainty avoidance values and an individual's attitude toward change may influence how an individual approaches changes to his or her behavior following a feedback intervention.

Scholars have hypothesized about the impact uncertainty avoidance has on the desire for feedback. Ashford, Blatt, and VandeWalle (2003) proposed that people with low tolerance for ambiguity (high uncertainty avoidance) may seek more feedback in uncertain

contexts than those with a high tolerance for ambiguity. Anseel and Lievens (2007) presented a more specific hypothesis that certainty orientation moderates the relationship between environment uncertainty and desire for feedback. They proposed that people with a high certainty orientation (high uncertainty avoidance) would seek or desire more feedback in situations where certainty is low and less desire when it is high than people with a low certainty orientation (low uncertainty avoidance).

Uncertainty avoidance may also impact the type of feedback provided. Davis (1998) has suggested that the directness or bluntness of feedback may vary in relation to the level of uncertainty avoidance in a given culture. No studies have been conducted to test these hypotheses.

Masculinity/femininity. This dimension refers to the distribution of roles between the sexes, ranging from masculine cultures which are competitive and aggressive to feminine cultures which are modest and nurturing. For example, Japan, Austria, and Venezuela are all cultures with a high masculinity index while Sweden, Norway, and the Netherlands are all cultures with a low masculinity index (Hofstede, 2001).

Of all of Hofstede's dimensions, masculinity/femininity has received the least attention from researchers, especially in the area of performance feedback and change. In an article on international performance measurement, Davis (1998) proposed that this dimension may impact performance appraisal by emphasizing different aspects of performance. For example, masculine cultures are expected to focus more on achievement while feminine cultures are expected to focus more on relationships. This would imply that leadership

achievement behaviors may be emphasized or valued more in masculine cultures and leadership relationship behaviors may be emphasized or valued more in feminine cultures; however, no studies have been conducted to test this hypothesis.

Culture and leadership

Although the United States' culture has been the foundation of most of management research (Boyacigiller & Alder, 1991) and a majority of leadership research has been conducted in the North America and Europe (Tsui et al., 2007), studying leadership in a global context is not a new concept. Cross-cultural studies have examined the application of leadership theories in different cultures, often comparing one culture to another. The GLOBE study by House et al. (2004) offered a comprehensive examination of leadership in different countries around the world, which contributed to the cross-cultural leadership literature.

Based on past research, the impact of culture on leadership is unclear. Research of European countries found that conceptualizations of leadership differed as a function of culture, where similar cultures shared similar conceptualizations (Brodbeck et al., 2000). This would suggest that culture has an impact on how leadership is conceptualized and that concepts of leadership differ across cultures; however, previous studies have presented contrary results. For example, Helgstrand and Stulmacher (1999) found that although Denmark and the United States differ on individualism/collectivism and femininity/masculinity dimensions of culture, participants from both countries rated feminine-individualistic leaders as most effective. Another study by Zagorsek, Jaklic, and Stough (2004) found similar scores on a leadership inventory for participants from Nigeria,

Slovenia, and the United States and concluded that culture does matter, but not as much as they initially thought.

Cross-cultural leadership research has found support for both universal and culturally specific leader attributes and behaviors. Research suggests charismatic behaviors (Dorfman et al., 1997) and attributes (Den Hartog et al., 1999) are universally endorsed; however, Yeung and Ready (1995) found the importance of vision was only endorsed by seven out of eight countries in their study of globally valued leader capabilities. Dorfman et al. (1997) also found supportive and contingent reward behaviors to be universal endorsed and directive and participative behaviors to be culturally specific.

Studies by Kowske and Anthony (2007) and Robie, Johnson, Nilsen, and Hazucha (2001) both found universal endorsement for leader behaviors related to analyzing issues. Behaviors that fostered team work (Kowske & Anthony, 2007) and those related to driving for results (Robie et al., 2001) were also universally endorsed as important to effective leadership. In addition to findings of similarities across cultures, Kowske and Anthony (2007) found countries conceptualized leader competence differently. Robie et al. (2001) also identified differences, for example the importance placed on acting with integrity, but concluded that their results suggest more similarities than differences among cultures.

Culture and leader development

Global leader development has been approached from two perspectives. The first seeks to develop leaders to effectively lead in a global environment (e.g. Black, 1999; Marquardt & Berger, 2000). The second focuses on developing leaders from diverse cultures

(e.g. Derr, Roussillon, & Bournois, 2002). This study sought to contribute to the latter by examining the relationship between multi-source feedback and performance improvement in a global sample. This study did not focus on developing characteristics that specifically differentiate leaders who effectively lead across cultures.

Despite the need for leader development in global companies, little research has been conducted in this area. Most of the literature focuses on either leader development within specific cultures or suggestions on how to conduct leader development in different cultures. For example, Yeung and Ready (1995) examined global leader development activities across cultures and recommended different learning delivery methods for countries based on the power distance and uncertainty avoidance of each culture. In cultures high in power distance and uncertainty avoidance such as Guatemala, they recommended developing leaders through assigned readings. In cultures with mid-levels of power distance and uncertainty avoidance like Thailand, they recommended brainstorming techniques. Finally, in low power distance and uncertainty avoidance cultures, such as Denmark, they suggested that experiential group learning would be the most effective approach.

Despite the existence of these studies, the impact of culture on leader development remains unclear. Seddon (1987) suggested that some cultures may view opportunities for development as threatening and leaders may approach these opportunities with strategies to maintain "face" or status rather than strategies to grow or learn.

Culture and multi-source feedback

Cultural differences may exist in the use, acceptance, and impact of multi-source feedback. Seddon (1987) suggested that performance appraisal may result in misunderstandings due to cultural differences in the way interpersonal feedback is managed. He suggested that providing direct feedback may be more appropriate in low power distance cultures rather than in those which are high in power distance. Leslie, Gryskiewicz, and Dalton (1998) also suggested that proper use of multi-source feedback instruments cross-culturally depends first on how acceptable and valuable it is to ask the various rater groups to provide feedback and second, on whether or not the feedback will be accepted as accurate by recipients. While this guidance is helpful, these proposals have yet to be studied empirically.

Organizations use multi-source feedback globally; however, the study of multi-source feedback outside of North America has been limited (Brutus et al., 2006). How participants view multi-source feedback and whether or not the process and resulting feedback are accepted may be impacted by culture (Kowske & Anthony, 2007).

Piecing together existing research provides some insight on how culture may impact different aspects of multi-source feedback. Research by Shipper, Hoffman, and Rotondo (2007) suggests that overall, 360-degree feedback has relevance cross-culturally, although the process is most effective in low power distance and individualistic cultures. In one of the few cross-cultural studies on 360-degree surveys, Gillespie (2005) found differences in both the underlying constructs and the relationship of the constructs to the survey items across cultures, suggesting that instruments may not have the same validity globally.

Previous studies have also found different feedback patterns across cultures. This may suggest that culture moderates the evaluations or ratings provided as part of multi-source feedback. In a study of managers from collectivist and high power distance cultures, Varela and Premeaux (2007) found self-peer agreement was the highest and emphasis was placed on people-oriented behaviors. Adsit, London, Crom, and Jones (1997) found country differences in the favorability of upward ratings and different sets of items distinguished the countries.

Studies of self-other agreement have also found differences across cultures. Gentry, Hannum, Ekelund, and de Jong (2007) examined derailment ratings in Europe and the US and found higher congruence in the European sample. In a study of the US and five European countries (United Kingdom, Germany, France, Denmark, and Italy), Atwater, Waldman, Ostroff, Robie, and Johnson (2005) found that self-other agreement varied among the countries. Further, they found self-other agreement was related to performance in the US sample only, while ratings by others were more important in the European sample.

Taken together, these findings suggest that culture impacts the multi-source feedback process. These findings also suggest that there are cultural differences in the relationship between feedback and performance change.

Hypotheses and Research Questions

This study consisted of two parts. The first portion of this study used a global sample to examine relationships between self-other agreement and performance change previously identified in the literature. With few exceptions (e.g. Atwater et al., 2005), research on this topic has largely been conducted using US subjects. In this portion of the study, relationships were hypothesized based on previous related research.

The second portion of the study examined culture values as a predictor of performance change and also as a moderator of the relationship between self-other agreement and performance change. Since this portion of the study was exploratory in nature, hypotheses or research questions were based on research conducted on related topics.

Examination of previously identified relationships

First, this study examined the change in leader performance following multi-source feedback provided as part of a leader development program. Kluger and DeNisi (1996) conducted a meta-analysis of the numerous studies which investigated the relationship between feedback and performance. Although they found mixed results, performance increased in a majority of the studies. Congruent with the overall positive relationships found in past studies, the current study tested the hypothesis that performance improved after receiving feedback:

Hypothesis 1: Leadership performance will improve after receiving multi-source feedback.

Next, this study examined the relationship between self-other rating agreement and performance. Several studies have previously investigated this relationship. Johnson and Ferstl (1999) looked at the effects of inter-rater and self-other agreement on performance improvement following upward feedback and found that over-raters were more likely to improve their performance while under-raters tended to decline. Additionally, they found that agreement within subordinate raters was negatively related to performance improvement, although that relationship was attributed to regression to the mean.

Later research also supported the relationship between self-other agreement and performance. For example, Shipper et al. (2003) found support for a positive relationship between self-awareness and leader effectiveness. Research also found that managers who initially either received the most negative feedback or who overrated themselves had the greatest improvement (e.g. Smither et al., 1995; Walker & Smither, 1999).

In a rare study using a cross-cultural sample, Atwater et al. (2005) proposed that self-other agreement was related to performance because self-awareness and high ratings should both contribute to better performance regardless of culture or context. Across six countries, they found support that self-other agreement was related to performance. Similar to the study by Atwater et al. (2005), the current study sought to extend previous research by examining the relationship between self-other agreement and performance in a global sample:

Hypothesis 2: Self-other rating agreement is positively related to performance change.

Examination of culture values as a predictor or moderator of performance change

Previous research suggests that there are cultural differences in the relationship between feedback and leader development. Shipper, Hoffman, and Rotondo (2007) examined the cultural relevance of the 360 degree feedback process and found that it was most effective in cultures with low power distance and individualistic values.

Comparing samples from the US and England, Earley and Stubblebine (1989) found different relationships between feedback and performance. They found a stronger relationship between feedback and performance for the US sample. They also found indirect support that uncertainty avoidance and power distance moderated the feedback-performance relationship.

These findings suggest that culture impacts the relationship between feedback and performance improvement. In the current study, culture was first examined as a profile or categorical variable. This was explored in the form of a research question:

Research Question 1: Is culture profile related to performance change after receiving multi-source feedback?

Culture was also examined as separate dimensions or continuous variables. Based on the existing literature, specific directional relationships were hypothesized for several of the culture dimensions; however, where no previous research existed, direction was not specified:

Hypothesis 3a: Scores on the individualism/collectivism scale are negatively related to performance change after receiving multi-source feedback.

That is, as scores on the individualism/collectivism scale increase (reflecting more collectivist values), gain scores will decrease.

Hypothesis 3b. Scores on the power distance scale are negatively related to performance change after receiving multi-source feedback.

Accordingly, as scores on the power distance scale increase (reflecting higher power distance values), gain scores will decrease.

Hypothesis 3c. Scores on the uncertainty avoidance scale are positively related to performance change after receiving multi-source feedback.

As such, gain scores are expected to increase as scores on the uncertainty avoidance scale increase (reflecting higher uncertainty avoidance values).

Hypothesis 3d. Scores on the masculinity/femininity scale are related to performance change after receiving multi-source feedback.

That is, gains scores are expected to differ for participants based on the extent to which their values reflect masculinity or femininity. Previous research on this dimension is limited, so although a relationship was hypothesized, the directionality of the relationship was not.

The current study also examined culture as a moderator of the relationship between self-other agreement and performance change. With the exception of a study by Atwater et al. (2005) which used culture as an exploratory variable, research in this area has been limited. In their study of US and European countries, Atwater et al. (2005) found the relationship between self-other agreement and performance differed across countries. They also found

differences in other ratings and performance based on the masculinity/femininity and individualism levels of a country.

More recently, Atwater, Wang, Smither, and Fleenor (2009) studied cultural characteristics and the relationship between self and others' leadership ratings and found cultural differences. Specifically, they found stronger relationships between self and peer ratings and self and subordinate ratings in cultures with high power distance and in those with high assertiveness. Individualism/collectivism was not found to be related to self-other ratings.

In a related but distinct area of research, Schwartz and Bilsky (1987) proposed a theory of values which hypothesized that individuals have structured and prioritized value systems. In the context of this theory, values refer to "desirable goals, varying in importance, that serve as guiding principles in people's lives" (Schwartz & Sagiv, 1995, p. 93). Based on this theory, Oishi, Diener, Suh, and Lucus (1999) proposed a "value-as-a-moderator" model to explain cross-cultural differences in subjective well-being. According to this model, cultural values influence an individual's perceptions of goal attainment as satisfying or not and important or not.

The "value-as-a-moderator" framework has been applied to concepts beyond subjective well-being. In their study of organizational commitment, Gelade, Dobson, and Auer (2008) used this model and found support that individualism/collectivism and masculinity/femininity dimensions moderated the relationship between job characteristic satisfaction and commitment. Culture has also helped to explain cross-cultural differences in

concepts such as reactions to job insecurity (Probst & Lawler, 2006), intentions to leave an organization (Spector et al., 2007). Based on these findings, the following research question was included in the current study:

Research Question 2: Does culture moderate the relationship between self-other rating agreement and performance change?

Method

Participants

Participants in this study were employees from a global technology organization who completed an internal leadership program in 2005, 2006, and 2007. All participants were technical employees from manufacturing, research, development, and services units of the organization. Participants were all part of the organization's talent development program and were identified for their leadership potential.

Program

The program consisted of a two day class which focused on leadership and professional development. Participation in the program was by nomination or invitation only and enrollment in the program was voluntary. Program sponsors received criteria to identify nominees from the global program office; however, these criteria were used only as guidelines. Approximately 75% those invited enrolled in the program.

As part of the program, participants were enrolled in a 360-degree survey of their leadership competencies. During the class, participants were debriefed on their survey results as a group and with time provided for individual questions. The review was conducted by the

class instructor who explained the different sections of the feedback report. As participants examined their reports, the instructor provided additional guidance on how to interpret the report, such as types of response patterns to look for. If survey results are not available, due to factors such as late enrollment in the class or lack of minimum respondents at the time of the class, the feedback report format was explained to them, they were given additional time to collect responses, and they were instructed to meet with their managers for individual debriefs.

Data collection

Participants were invited to take part in this study via email. The invitation explained the nature of the study and requested their participation. Participation in the study was voluntary. The email also contained a link to the culture values survey for participants to complete and submit on-line. In addition to the culture value data collected as part of this study, archival data was used to determine leadership performance.

Measures

Leader performance. In this study, leader performance referred to the performance of behaviors that have been identified as manifestations of competencies. Leader performance was operationalized as leadership competency ratings.

Leadership competencies at time 1 was determined using a 360-degree feedback survey. The survey assessed participants on 10 corporate leadership competencies. The survey was composed of 99 items, including four open-ended questions. The rated items were behavior-based and were rated using a 7-point scale (1=not characteristic, 4= somewhat

characteristic, 7= very characteristic). Responses to open-ended questions provided participants with additional information and were not factored into competency scores.

Surveys were administered on-line. Each participant was allowed to select his or her own raters. Peer and subordinate feedback was anonymous, while manager feedback was not. Participants received feedback at both the item and competency level. At both levels, feedback was presented as a summary across groups and separately by rating groups (self, manager, peer, subordinates).

At time 2, participants completed a shorter survey to reassess their competencies. The shorter survey consisted of a subset of items from the longer survey. For each competency, the subset of items predicted at least 90% of the full composite score. The survey was developed in order to decrease the time commitment needed for raters to provide feedback. When considering the number of raters required for each participant (self and multiple others) and the time required to complete the full survey (30-45 minutes), the business value of the shorter survey in time is appreciable. For analysis in this study, only the subset of items included on both the long and short surveys was used.

Feedback collected at both times was intended for developmental and research use and not administrative use (such as for selection or performance appraisal); as such, results were only sent to the participants and not to their management. Due to the proprietary and confidential nature of the surveys, only sample items are included in Appendix A.

Culture values. As part of this study, participants were asked to complete an additional survey. Culture values were measured using cultural scales originally created by Dorfman and Howell (1988) (see Clugston, Howell, & Dorman, 2000 for items). Items for these scales were adapted from the ecological level constructs proposed by Hofstede (1980). This instrument was selected because items were specifically created to measure culture dimension at the individual level. Each scale consisted of five or six items. For each item, participants were asked to indicate the extent to which they agreed with the item, using a 5-point scale (1 = completely disagree, 3 = neither agree nor disagree, 5 = completely agree). This survey was administered on-line. Of the 603 employees invited to participate in the survey, 334 completed the survey (55%). This response rate is above the 35.7% average response rate for data collected in organizations (Baruch & Holtom, 2008).

Level of analysis issue

Level of analysis is a common issue in cross-cultural research. Culture is defined as the "collective programming of the mind that distinguishes the members of one group or category of people from another" (p. 9, Hofstede, 2001). This definition positions culture as a group-level construct. A research fallacy occurs when individual measures are correlated to societal factors or when group factors are applied to individuals. The terms "collective" and "group" illustrate why applying culture to an individual is not appropriate.

Hofstede (2001) makes the distinction between cultural values and culture. Cultural values compare individuals while culture compares societal issues. The items Hofstede used in his culture survey were intended to measure culture at the ecological or national level.

While this level is useful for societal studies, it is not appropriate for individual level studies. Dorfman and Howell (1988) identified the need for an individual measure of cultural values that "would allow us to move beyond broad generalizations about national cultures" (p. 130). Additionally, Triandis, Leung, Villareal, and Clack (1985), Maznevski, Gomez, DiStefano, Noorderhaven, and Wu (2002), and Ergeneli, Gohar, and Temirbekova (2007) have also examined culture at the individual level.

In this study, cultural values were measured at the individual level. This allowed the relationship between cultural values and individual outcomes to be studied without any level of analysis inconsistencies.

Analyses and Results

Prior to testing the hypotheses and research questions, confirmatory factory analysis (CFA) was conducted using AMOS to verify the factor structure and reduce the number of factors. The CFA was first conducted on a 10 factor model which specified that each item loaded on its respective competency and where each competency was treated as a separate factor. Based on the CFA, modification indices were reviewed to identify factors to collapse. The resulting nine factor model did not provide a better fit than the initial model so the original model was retained. Based on the model, 10 dimensions were used in this study: Managing Challenge and Complexity (MCC), Demonstrating Trustworthiness (DT), Enabling Performance (EP), Thinking Broadly (TB), Collaborating (C), Partnering with Clients (PC), Making Sound Decisions (MSD), Taking Strategic Risks (TSR), Developing Others (DO), and Demonstrating Passion for the Business (DPB). Modification indices from

the initial model were again reviewed to identify items to drop. Items with high regression weight modification indices on multiple factors were dropped one at a time. After each item was dropped, the fit of the model was evaluated using the comparative fit index (CFI; Bentler, 1990) and the root-mean-square error of approximation (RMSEA, Browne & Cudeck, 1993). Hu and Bentler (1999) suggest that models with a CFI value of 0.95 or higher and an RMSEA value of 0.06 or lower, are good fits to the data. The final model had a CFI value of 0.952 and an RMSEA value of .049. In all, five items were dropped which left five factors with three items each and five factors with four items each.

Brown (2006) recommended four steps to determine measurement invariance between two groups. First, separate CFA should be conducted to test the model for each group. The results for the first group (time 1) are reported above. For the second group (time 2), this analysis resulted in a CFI value of 0.948 and an RMSEA value of 0.050. While the CFI was slightly below the recommended criteria, taken with the RMSEA value, both suggest that CFA model fit the time 2 data and suggest that the model has not changed. Second, simultaneous tests of identical structure should be conducted. Third, the regression weights should be constrained to test the equality of factor loadings. Finally, the intercepts should be constrained to test their equality across models. Model fit statistics are summarized in the Table 1. All fit statistics were at or near the suggested values.

Table 1.

Multi-group analysis model statistics

Step	Test	RMSEA	CFI
1	Single group solutions		
	Time 1	0.049	0.952
	Time 2	0.050	0.948
	Measurement invariance		
2	Equal form	0.035	0.951
3	Equal factor loadings	0.034	0.951
4	Equal intercepts	0.034	0.951

With two exceptions, all remaining analyses were performed using Statistical Package for Social Sciences (SPSS). First, cluster analysis was done using SLEIPNER (Bergman & El-Khouri, 2002). Second, response surface methodology (RSM) was plotted using a formatted Microsoft Excel file (Edwards, n.d.). Table 2 presents the mean, standard deviation, reliabilities, and intercorrelations of the leadership competency dimensions observed in this study.

To justify aggregation of raters, inter-rater agreement was calculated using r_{wg}, a measure of inter-rater agreement, and interclass correlations [ICC(2)], which LeBreton and Sentor (2008) suggest measures both inter-rater agreement and inter-rater reliability. These were computed for each rating group on each factor. Using previous studies as a guideline, aggregation would be justified if ICC are above .50 (e.g. Fleenor, McCauley, & Brutus, 1996; Ostroff et al., 2004) or if $r_{wg(j)}$ are above 0.70 (James, Demaree, & Wolf, 1984). ICC (2) fell below 0.50 for almost all cases. For colleagues, all ICC(2) calculations were below 0.50 for both time 1 and time 2. Subordinate ICC(2) calculations were above 0.50 for four

dimensions at time 1; however, no ICC(2) calculations were above .50 for time 2. The calculated $r_{wg(j)}$ were over 0.70 for all rating groups at both times, ranging from 0.76 to 0.97. The low ICC(2) and acceptable $r_{wg(j)}$ suggest that inter-rater reliability is low while intra-rater agreement is high. For the purposes of this study, scores within each rating sources were combined on the basis of inter-rater agreement (James et al., 1984).

A summary of the data sources and sample sizes used in the analysis of each hypothesis and research question is included in Appendix B.

Table 2.

Intercorrelations Between Competency Dimensions and Observed Subscale Reliabilities for All Raters (N = 4960)

Dimension	Mean	SD	PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB
PC	6.254	.744	(.811)									
C	6.094	.861	.607**	(.833)								
MCC	5.896	.939	.625**	.728**	(.800)							
TB	5.969	.882	.650**	.548**	.602**	(.834)						
MSD	6.173	.796	.662**	.574**	.631**	.645**	(.819)					
TSR	5.800	1.013	.591**	.612**	.687**	.626**	.622**	(.846)				
DT	6.166	.874	.557**	.701**	.646**	.483**	.573**	.526**	(.840)			
EP	5.882	.930	.623**	.675**	.734**	.631**	.635**	.727**	.617**	(.879)		
DO	5.907	1.020	.558**	.634**	.657**	.588**	.549**	.614**	.600**	.708**	(.857)	
DPB	6.265	.834	.594**	.529**	.546**	.667**	.556**	.543**	.509**	.611**	.583**	(.820)

Note: Subscale reliabilities are presented in parentheses, on the diagonal. PC= Partnering with Clients (4 items), C=Collaborating (4 items), MCC= Managing Challenge and Complexity (3 items), TB= Thinking Broadly (4 items), MSD= Making Sound Decisions (3 items), TSR= Taking Strategic Risks (3 items), DT= Demonstrating Trustworthiness (4 items), EP= Enabling Performance (4 items), DO= Developing Others (3 items), DPB= Demonstrating Passion for the Business (3 items).

**$p < .01$.

Performance change

Hypothesis 1 predicted that performance would increase following multi-source feedback. A paired-samples t-test was used to determine if ratings at time 2 were significantly higher than ratings from time 1. Table 3 presents the results for each rating sources.

While ratings at time 2 were higher than time 1 for all competency dimension and all rating sources, only a subset of these were significant. Colleague ratings resulted in the highest number of significant improvements, in nine out of ten dimensions, while manager and subordinate ratings showed the least, with two out of ten dimensions. Self ratings showed significant improvement on six dimensions. Performance on Demonstrating Passion for the Business was the only competency dimension to show significant increase across all rating sources.

Eta squared statistics are also included in the Table 3. They indicate multi-source feedback had a varied effect across dimensions, ranging from no effect ($\eta^2 < 0.01$) to a large effect ($\eta^2 \geq 0.14$) (Cohen, 1988). These results partially support the hypothesis.

Table 3.

Mean Score Differences and Effect Sizes by Rating Source

	Self				Manager				Colleagues				Subordinates			
Dimension	M (SD)	df	*t*	η^2	M (SD)	df	*t*	η^2	M (SD)	df	*t*	η^2	M (SD)	df	*t*	η^2
PC	0.18 (0.82)	202	3.19**	0.048	0.11 (.83)	148	1.66	0.018	0.14 (0.50)	215	4.10***	0.072	0.06 (0.48)	166	1.59	0.015
C	0.11 (0.82)	199	1.85	0.012	0.12 (0.93)	148	1.59	0.017	0.04 (0.54)	215	1.13	0.006	0.06 (0.62)	166	1.18	0.008
MCC	0.05 (0.90)	202	0.81	0.003	0.03 (0.88)	148	0.41	0.001	0.14 (0.56)	215	3.75***	0.061	0.09 (0.71)	166	1.66	0.017
TB	0.29 (0.91)	201	4.54***	0.093	0.15 (1.09)	148	1.63	0.018	0.21 (0.55)	215	5.68***	0.131	0.11 (0.59)	166	2.56*	0.032
MSD	0.11 (0.86)	201	1.86	0.017	0.15 (0.78)	148	2.37*	0.037	0.15 (0.50)	215	4.27***	0.078	0.05 (0.61)	166	1.10	0.007
TSR	0.22 (1.04)	194	2.94**	0.043	0.03 (1.16)	146	0.36	0.001	0.10 (0.67)	214	2.19*	0.022	0.07 (0.74)	166	1.20	0.009
DT	0.21 (0.80)	201	3.76***	0.066	0.08 (0.86)	148	1.15	0.008	0.11 (0.49)	215	3.36***	0.050	0.07 (0.66)	166	1.35	0.011
EP	0.15 (0.97)	201	2.22*	0.024	0.07 (1.00)	146	0.89	0.005	0.16 (0.53)	215	4.47***	0.085	0.06 (0.62)	166	1.23	0.009
DO	0.13 (1.06)	201	1.78	0.016	0.08 (1.04)	145	0.95	0.006	0.19 (0.63)	215	4.42***	0.083	0.07 (0.74)	166	1.28	0.010
DPB	0.21 (0.89)	200	3.36**	0.053	0.26 (0.89)	148	3.63***	0.082	0.21 (0.51)	215	6.22***	0.153	0.11 (0.63)	166	2.20*	0.028

Note: PC= Partnering with Clients, C=Collaborating, MCC= Managing Challenge and Complexity, TB= Thinking Broadly, MSD= Making Sound Decisions, TSR= Taking Strategic Risks, DT= Demonstrating Trustworthiness, EP= Enabling Performance, DO= Developing Others, DPB= Demonstrating Passion for the Business.
*$p < .05$. **$p < .01$. ***$p < .001$.

Self-other rating agreement and performance change

Hypothesis 2 examined the relationship between self-other rating agreement and performance change. Participants with high self-other agreement were hypothesized to also have higher performance change. Performance change was operationalized as a gain score, or the amount of change in a single construct (Rogosa & Willet, 1983). Analyses were conducted on self gain score and other gain scores. Gain score was calculated by subtracting the performance score at time 1 from the performance score at time 2 at the competency dimension level. Separate analyses were conducted for each gain score.

Self and other scales were centered prior to analysis. For each dimension, items were averaged and the scale midpoint (4) was subtracted from each. Scales were centered to

reduce multicollinearity between the component measures and the interaction term and higher order terms (Cronbach, 1987).

Using a procedure recommended in Edwards and Parry (1993) and Edwards (1994), polynomial regression was used to examine the relationship between self-other agreement and performance change. This method is preferred over difference scores because it allows the relationship between agreement and the dependent variable to be examined as a three dimensional relationship. Rather than reduce the self and other scores into a single variable of difference, thereby reducing the relationship with the dependent variable to a two dimensional relationship, polynomial regression maintains the self and other as separate variables.

Edwards (2002) recommended using a conservative approach to select the regression model by evaluating both a squared difference model and an absolute difference model to see if they yield the same results. The squared difference equation is:

$$Z= b_0+ b_1(self) + b_2(other) + b_3 (self)^2 + b_4(self \times other) + b_5(other)^2 + e \quad (1)$$

The absolute difference equation is:

$$Z= b_0+ b_1(self) + b_2(other) + b_3W + b_4(self \times W) + b_5(other \times W) + e \quad (2)$$

W is a dummy variable that equals 0 when self rating is higher than or equal to other rating and equals 1 when self rating is lower than other rating.

Separate analyses were conducted for each rating group and the two equations were compared using the criteria described by Edwards (1994) to determine the appropriateness of each model. If the two models produced similar results, Edwards (2002) suggested that either

could be used. Since that condition was met, the squared difference model was used for this study. All regression models were significant at the p< .001 level. Model statistics (*F*-test and R^2) are presented in Table 4. Additional results of the regression tests are presented in Tables 5.1 though 5.6.

Table 4.

Polynomial Regression Tests for the Relationship Between Self-Other Agreement and Gain Score.

	Gain Score	Self		Other	
	Dimension	Model fit	R^2	Model fit	R^2
Self-Manager	PC	F (5, 113) = 9.27	.291	F (5, 113) = 24.92	.524
	C	F (5, 111) = 11.81	.347	F (5, 113) = 20.00	.470
	MCC	F (5, 113) = 22.46	.498	F (5, 113) = 7.94	.260
	TB	F (5, 112) = 8.26	.269	F (5, 113) = 23.74	.512
	MSD	F (5, 112) = 17.07	.433	F (5, 113) = 24.33	.518
	TSR	F (5, 108) = 17.07	.411	F (5, 113) = 12.52	.357
	DT	F (5, 113) = 9.46	.295	F (5, 113) = 8.41	.271
	EP	F (5, 110) = 10.11	.315	F (5, 111) = 8.59	.279
	DO	F (5, 109) = 12.16	.358	F (5, 110) = 10.65	.326
	DPB	F (5, 111) = 10.51	.321	F (5, 113) = 15.08	.400
Self-Colleagues	PC	F (5, 166) = 19.38	.369	F (5, 166) = 7.81	.190
	C	F (5, 163) = 18.98	.368	F (5, 166) = 9.31	.219
	MCC	F (5, 166) = 31.03	.483	F (5, 166) = 10.91	.235
	TB	F (5, 165) = 19.08	.366	F (5, 166) = 11.27	.253
	MSD	F (5, 165) = 25.51	.436	F (5, 166) = 10.97	.248
	TSR	F (5, 158) = 32.25	.505	F (5, 165) = 9.84	.230
	DT	F (5, 166) = 19.04	.364	F (5, 166) = 5.55	.143
	EP	F (5, 165) = 23.72	.418	F (5, 166) = 5.23	.136
	DO	F (5, 165) = 21.43	.394	F (5, 166) = 17.82	.349
	DPB	F (5, 164) = 19.23	.370	F (5, 166) = 9.74	.227
Self-Subordinates	PC	F (5, 128) = 10.94	.299	F (5, 128) = 10.52	.291
	C	F (5, 126) = 18.75	.427	F (5, 128) = 16.05	.385
	MCC	F (5, 128) = 22.05	.462	F (5, 128) = 19.04	.427
	TB	F (5, 127) = 8.03	.240	F (5, 128) = 17.96	.412
	MSD	F (5, 128) = 17.28	.403	F (5, 128) = 18.72	.422
	TSR	F (5, 124) = 31.26	.558	F (5, 128) = 16.67	.394
	DT	F (5, 128) = 21.15	.452	F (5, 128) = 17.06	.400
	EP	F (5, 127) = 16.33	.391	F (5, 128) = 13.97	.353
	DO	F (5, 127) = 18.65	.423	F (5, 128) = 21.03	.451
	DPB	F (5, 126) = 16.77	.400	F (5, 128) = 31.65	.553

Note: PC= Partnering with Clients, C=Collaborating, MCC= Managing Challenge and Complexity, TB= Thinking Broadly, MSD= Making Sound Decisions, TSR= Taking Strategic Risks, DT= Demonstrating Trustworthiness, EP= Enabling Performance, DO= Developing Others, DPB= Demonstrating Passion for the Business.
All model fit statistics are significant at the $p < .001$ level.

Table 5.1

Regression Tests for the Relationship between Self-Manager Agreement and Self Gain Scores

Dimension	Predictors	B	SE	β	R^2
PC	Intercept	-.161	.537		.291
	Self	.030	.367	.028	
	Manager	.617	.332	.562	
	$Self^2$	-.018	.083	-.059	
	SelfxManager	-.235	.145	-.648	
	$Manager^2$	-.015	.088	-.050	
C	Intercept	.905	.303		.347
	Self	-.815	.251	-.736**	
	Manager	.491	.256	.494	
	$Self^2$	.079	.093	.229	
	SelfxManager	-.056	.121	-.143	
	$Manager^2$	-.082	.077	-.262	
MCC	Intercept	.934	.252		.498
	Self	-1.152	.247	-1.072***	
	Manager	.618	.190	.563**	
	$Self^2$	.150	.063	.431*	
	SelfxManager	-.014	.085	-.032	
	$Manager^2$	-.146	.067	-.399*	
TB	Intercept	.647	.373		.269
	Self	-.657	.227	-.623**	
	Manager	.325	.305	.274	
	$Self^2$	.058	.072	.132	
	SelfxManager	.007	.134	.015	
	$Manager^2$	-.074	.074	-.204	
MSD	Intercept	1.555	.372		.433
	Self	-1.210	.279	-1.145***	
	Manager	-.106	.289	-.095	
	$Self^2$	.123	.071	.356	
	SelfxManager	.088	.095	.238	
	$Manager^2$	.035	.081	.107	
TSR	Intercept	.810	.182		.441
	Self	-.566	.152	-.586***	
	Manager	.275	.146	.256	
	$Self^2$	-.002	.053	-.005	
	SelfxManager	-.055	.070	-.118	
	$Manager^2$	-.042	.052	-.100	
DT	Intercept	.460	.313		.295
	Self	-.464	.255	-.453	
	Manager	.436	.269	.410	
	$Self^2$	.044	.075	.127	
	SelfxManager	-.121	.112	-.329	
	$Manager^2$	-.013	.085	-.041	
EP	Intercept	.693	.274		.315
	Self	-.837	.299	-.733**	
	Manager	.353	.243	.303	
	$Self^2$	.081	.090	.185	
	SelfxManager	.013	.111	.024	
	$Manager^2$	-.061	.085	-.155	
DO	Intercept	.839	.308		.358
	Self	-.737	.216	-.671***	
	Manager	.132	.289	.102	
	$Self^2$	.054	.058	.126	
	SelfxManager	-.025	.116	-.052	
	$Manager^2$	.032	.090	.075	
DPB	Intercept	.148	.323		.321
	Self	-.036	.212	-.037	
	Manager	.575	.275	.489*	
	$Self^2$	-.054	.054	-.152	
	SelfxManager	-.192	.102	-.525	
	$Manager^2$	-.029	.084	-.086	

Note: PC= Partnering with Clients, C=Collaborating, MCC= Managing Challenge and Complexity, TB= Thinking Broadly, MSD= Making Sound Decisions, TSR= Taking Strategic Risks, DT= Demonstrating Trustworthiness, EP= Enabling Performance, DO= Developing Others, DPB= Demonstrating Passion for the Business. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 5.2

Regression Tests for the Relationship between Self-Colleague Agreement and Self Gain Scores

Dimension	Predictors	B	SE	β	R^2
PC	Intercept	-.499	1.075		0.369
	Self	-.843	.580	-.799	
	Colleague	1.248	1.308	.528	
	Self^2	.012	.087	.039	
	SelfxColleague	.021	.323	.054	
	Colleague^2	-.147	.407	-.254	
C	Intercept	-.048	.717		0.368
	Self	-1.077	.322	-1.008	
	Colleague	1.578	.827	.778	
	Self^2	.062	.091	.196	
	SelfxColleague	.100	.229	.236	
	Colleague^2	-.397	.270	-.729	
MCC	Intercept	.415	.545		0.483
	Self	-1.234	.268	-1.170	
	Colleague	1.184	.642	.569	
	Self^2	.148	.070	.428	
	SelfxColleague	.059	.196	.127	
	Colleague^2	-.358	.221	-.603	
TB	Intercept	-.831	.866		.366
	Self	-.815	.433	-.837	
	Colleague	1.653	1.219	.767	
	SelfxColleague	.097	.072	.241	
	Self^2	-.037	.290	-.083	
	Colleague^2	-.299	.419	-.495	
MSD	Intercept	1.142	1.038		.436
	Self	-1.154	.431	-1.111	
	Colleague	.199	1.189	.082	
	Self^2	.099	.072	.297	
	SelfxColleague	.073	.251	.171	
	Colleague^2	-.025	.363	-.042	
TSR	Intercept	.666	.462		.505
	Self	-.787	.231	-.778	
	Colleague	.161	.661	.073	
	Self^2	.067	.049	.160	
	SelfxColleague	-.081	.151	-.160	
	Colleague^2	.092	.243	.133	
DT	Intercept	-.025	.606		.364
	Self	-.462	.297	-.474	
	Colleague	.876	.691	.471	
	Self^2	.032	.063	.100	
	SelfxColleague	-.143	.173	-.365	
	Colleague^2	-.075	.217	-.151	
EP	Intercept	-.661	.739		.418
	Self	-.271	.332	-.246	
	Colleague	1.318	.863	.520	
	Self^2	.077	.063	.190	
	SelfxColleague	-.372	.216	-.706	
	Colleague^2	-.134	.281	-.182	
DO	Intercept	.832	.562		.394
	Self	-.922	.307	-.858**	
	Colleague	.575	.702	.244	
	SelfxColleague	-.058	.056	-.154	
	Self^2	.215	.208	.436	
	Colleague^2	-.223	.249	-.329	
DPB	Intercept	-.582	.770		.370
	Self	.249	.374	.266	
	Colleague	.580	.919	.280	
	Self^2	.041	.059	.122	
	SelfxColleague	-.508	.232	-1.349*	
	Colleague^2	.191	.293	.367	

Note: PC= Partnering with Clients, C=Collaborating, MCC= Managing Challenge and Complexity, TB= Thinking Broadly, MSD= Making Sound Decisions, TSR= Taking Strategic Risks, DT= Demonstrating Trustworthiness, EP= Enabling Performance, DO= Developing Others, DPB= Demonstrating Passion for the Business. *$p < .05$. ***$p < .001$.

Table 5.3

Regression Tests for the Relationship between Self-Subordinate Agreement and Self Gain Scores

Dimension	Predictors	B	SE	β	R^2
PC	Intercept	-1.240	1.487		.299
	Self	.046	.540	.047	
	Subordinate	1.367	1.297	.714	
	Self^2	-.012	.076	-.042	
	SelfxSubordinate	-.228	.211	-.650	
	Subordinate^2	-.153	.304	-.364	
C	Intercept	-.116	.496		.427
	Self	-.781	.256	-.790	
	Subordinate	1.552	.514	1.132	
	Self^2	.043	.071	.151	
	SelfxSubordinate	-.008	.118	-.022	
	Subordinate^2	-.359	.137	-1.034	
MCC	Intercept	1.171	.504		.463
	Self	-1.001	.308	-1.006	
	Subordinate	.331	.407	.227	
	Self^2	.052	.066	.166	
	SelfxSubordinate	.095	.157	.229	
	Subordinate^2	-.136	.116	-.343	
TB	Intercept	-.138	.644		.240
	Self	-.456	.347	-.495	
	Subordinate	.824	.671	.502	
	Self^2	.046	.060	.127	
	SelfxSubordinate	-.050	.175	-.128	
	Subordinate^2	-.154	.190	-.363	
MSD	Intercept	.797	1.205		.403
	Self	-.399	.449	-.409	
	Subordinate	-.047	.916	-.027	
	Self^2	.030	.065	.098	
	SelfxSubordinate	-.139	.167	-.354	
	Subordinate^2	.110	.189	.268	
TSR	Intercept	.207	.522		.558
	Self	-.820	.223	-.849***	
	Subordinate	1.083	.533	.598*	
	Self^2	-.024	.054	-.064	
	SelfxSubordinate	.089	.110	.208	
	Subordinate^2	-.291	.147	-.607*	
DT	Intercept	.733	.583		.452
	Self	-.126	.252	-.145	
	Subordinate	.099	.577	.074	
	Self^2	-.022	.050	-.075	
	SelfxSubordinate	-.193	.111	-.586	
	Subordinate^2	.085	.151	.261	
EP	Intercept	1.121	.794		.391
	Self	-.722	.387	-.671	
	Subordinate	-.092	.762	-.053	
	SelfxSubordinate	.026	.075	.066	
	Self^2	-.011	.186	-.022	
	Subordinate^2	.051	.203	.112	
DO	Intercept	.773	.378		.423
	Self	-.508	.223	-.513	
	Subordinate	.335	.368	.222	
	Self^2	.003	.045	.008	
	SelfxSubordinate	-.078	.117	-.184	
	Subordinate^2	-.054	.113	-.125	
DPB	Intercept	.999	.369		.400
	Self	-.797	.230	-.951*	
	Subordinate	.276	.299	.208	
	Self^2	-.033	.045	-.111	
	SelfxSubordinate	.159	.116	.491	
	Subordinate^2	-.098	.094	-.274	

Note: PC= Partnering with Clients, C=Collaborating, MCC= Managing Challenge and Complexity, TB= Thinking Broadly, MSD= Making Sound Decisions, TSR= Taking Strategic Risks, DT= Demonstrating Trustworthiness, EP= Enabling Performance, DO= Developing Others, DPB= Demonstrating Passion for the Business. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 5.4

Regression Tests for the Relationship between Self-Manager Agreement and Manager Gain Scores

Dimension	Predictors	B	SE	β	R^2
PC	Intercept	2.168	.470		.524
	Self	-.169	.321	-.149	
	Manager	-1.144	.290	-.975***	
	Self^2	.064	.073	.193	
	SelfxManager	.011	.127	.028	
	Manager^2	.077	.077	.241	
C	Intercept	1.386	.300		.470
	Self	.347	.251	.284	
	Manager	-1.000	.256	-.900***	
	Self^2	-.188	.084	-.508*	
	SelfxManager	.248	.109	.562*	
	Manager^2	-.056	.076	-.159	
MCC	Intercept	.895	.289		.260
	Self	-.247	.284	-.243	
	Manager	-.290	.218	-.280	
	Self^2	.032	.072	.096	
	SelfxManager	.135	.098	.332	
	Manager^2	-.150	.077	-.432	
TB	Intercept	1.598	.337		.512
	Self	.114	.205	.098	
	Manager	-1.033	.276	-.782***	
	Self^2	-.011	.065	-.023	
	SelfxManager	.046	.121	.094	
	Manager^2	.002	.067	.005	
MSD	Intercept	1.665	.311		.518
	Self	.053	.233	.055	
	Manager	-1.049	.241	-1.042***	
	Self^2	.000	.059	.001	
	SelfxManager	.037	.080	.109	
	Manager^2	.077	.067	.262	
TSR	Intercept	.887	.197		.357
	Self	.078	.173	.076	
	Manager	-.674	.153	-.606***	
	Self^2	-.015	.060	-.034	
	SelfxManager	-.002	.077	-.003	
	Manager^2	.002	.056	.004	
DT	Intercept	.692	.334		.271
	Self	.442	.273	.412	
	Manager	-.248	.287	-.222	
	Self^2	-.078	.080	-.214	
	SelfxManager	-.035	.119	-.090	
	Manager^2	-.089	.091	-.275	
EP	Intercept	.773	.262		.279
	Self	-.021	.280	-.020	
	Manager	-.305	.233	-.280	
	Self^2	.041	.083	.105	
	SelfxManager	-.058	.105	-.118	
	Manager^2	-.069	.081	-.187	
DO	Intercept	1.067	.293		.326
	Self	-.004	.204	-.004	
	Manager	-.440	.275	-.366	
	Self^2	.005	.052	.014	
	SelfxManager	-.038	.110	-.085	
	Manager^2	-.062	.086	-.158	
DPB	Intercept	1.570	.276		.400
	Self	.065	.172	.073	
	Manager	-.725	.234	-.686**	
	Self^2	-.028	.044	-.086	
	SelfxManager	.025	.078	.076	
	Manager^2	.004	.069	.012	

Note: PC= Partnering with Clients, C=Collaborating, MCC= Managing Challenge and Complexity, TB= Thinking Broadly, MSD= Making Sound Decisions, TSR= Taking Strategic Risks, DT= Demonstrating Trustworthiness, EP= Enabling Performance, DO= Developing Others, DPB= Demonstrating Passion for the Business. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 5.5

Regression Tests for the Relationship between Self-Colleague Agreement and Colleague Gain Scores

Dimension	Predictors	B	SE	β	R^2
PC	Intercept	.213	.731		.190
	Self	-1.025	.394	-1.619**	
	Colleague	1.342	.889	.945	
	$Self^2$	-.035	.059	-.185	
	SelfxColleague	.474	.219	1.983*	
	$Colleague^2$	-.601	.277	-1.736*	
C	Intercept	1.566	.467		.219
	Self	-.018	.209	-.028	
	Colleague	-1.103	.538	-.918*	
	$Self^2$	.107	.059	.587	
	SelfxColleague	-.196	.149	-.785	
	$Colleague^2$	.264	.176	.817	
MCC	Intercept	1.281	.385		.235
	Self	-.003	.189	-.005	
	Colleague	-.624	.453	-.516	
	$Self^2$	-.003	.050	-.015	
	SelfxColleague	-.019	.138	-.071	
	$Colleague^2$	.033	.156	.096	
TB	Intercept	1.470	.525		.253
	Self	-.288	.263	-.530	
	Colleague	-.558	.740	-.462	
	$Self^2$	-.074	.043	-.328	
	SelfxColleague	.233	.176	.937	
	$Colleague^2$	-.071	.254	-.210	
MSD	Intercept	2.417	.697		.248
	Self	-.366	.289	-.604	
	Colleague	-1.260	.797	-.894	
	$Self^2$	-.016	.049	-.084	
	SelfxColleague	.188	.169	.761	
	$Colleague^2$	.082	.243	.229	
TSR	Intercept	1.623	.330		.230
	Self	.322	.169	.521	
	Colleague	-1.673	.474	-1.247***	
	$Self^2$	.043	.037	.172	
	SelfxColleague	-.286	.111	-.924*	
	$Colleague^2$	.478	.175	1.129**	
DT	Intercept	.592	.406		.143
	Self	-.072	.199	-.128	
	Colleague	.156	.462	.145	
	$Self^2$	-.055	.042	-.303	
	SelfxColleague	.087	.116	.384	
	$Colleague^2$	-.164	.145	-.577	
EP	Intercept	1.261	.461		.136
	Self	-.159	.206	-.284	
	Colleague	-.685	.539	-.526	
	$Self^2$	.013	.038	.062	
	SelfxColleague	.039	.133	.146	
	$Colleague^2$	.066	.176	.174	
DO	Intercept	2.338	.333		.349
	Self	-.110	.182	-.181	
	Colleague	-1.619	.416	-1.201***	
	$Self^2$	.001	.032	.003	
	SelfxColleague	.034	.124	.123	
	$Colleague^2$	.255	.148	.657	
DPB	Intercept	1.000	.463		.227
	Self	.151	.224	.298	
	Colleague	-.237	.552	-.211	
	$Self^2$	-.043	.035	-.238	
	SelfxColleague	-.045	.139	-.223	
	$Colleague^2$	-.034	.176	-.119	

Note: PC= Partnering with Clients, C=Collaborating, MCC= Managing Challenge and Complexity, TB= Thinking Broadly, MSD= Making Sound Decisions, TSR= Taking Strategic Risks, DT= Demonstrating Trustworthiness, EP= Enabling Performance, DO= Developing Others, DPB= Demonstrating Passion for the Business. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 5.6

Regression Tests for the Relationship between Self-Subordinate Agreement and Subordinate Gain Scores

Dimension	Predictors	B	SE	β	R^2
PC	Intercept	1.157	.866		.291
	Self	.611	.314	1.084	
	Subordinate	-.954	.755	-.860	
	Self^2	.003	.044	.018	
	SelfxSubordinate	-.200	.123	-.985	
	Subordinate^2	.156	.177	.639	
C	Intercept	1.097	.391		.385
	Self	.350	.200	.470	
	Subordinate	-.579	.405	-.550	
	Self^2	-.061	.055	-.289	
	SelfxSubordinate	-.027	.094	-.097	
	Subordinate^2	-.015	.108	-.057	
MCC	Intercept	.639	.398		.427
	Self	.698	.243	.919**	
	Subordinate	-.468	.321	-.420	
	Self^2	-.022	.052	-.093	
	SelfxSubordinate	-.272	.123	-.862*	
	Subordinate^2	.054	.091	.180	
TB	Intercept	1.269	.356		.412
	Self	.196	.192	.339	
	Subordinate	-.745	.371	-.722*	
	Self^2	.093	.033	.411**	
	SelfxSubordinate	-.153	.097	-.635	
	Subordinate^2	.067	.105	.249	
MSD	Intercept	2.075	.857		.422
	Self	-.165	.319	-.234	
	Subordinate	-.995	.652	-.793	
	Self^2	.024	.046	.110	
	SelfxSubordinate	.099	.119	.349	
	Subordinate^2	.006	.135	.021	
TSR	Intercept	.002	.368		.394
	Self	.478	.156	.813**	
	Subordinate	.524	.376	.477	
	Self^2	-.049	.038	-.214	
	SelfxSubordinate	-.114	.077	-.439	
	Subordinate^2	-.274	.103	-.943**	
DT	Intercept	.930	.509		.400
	Self	.385	.220	.529	
	Subordinate	-.303	.504	-.273	
	Self^2	-.046	.044	-.185	
	SelfxSubordinate	-.092	.097	-.333	
	Subordinate^2	-.062	.132	-.228	
EP	Intercept	-.517	.501		.353
	Self	.112	.245	.171	
	Subordinate	1.283	.481	1.188**	
	Self^2	-.033	.046	-.138	
	SelfxSubordinate	.026	.117	.087	
	Subordinate^2	-.496	.129	-1.776***	
DO	Intercept	1.517	.249		.451
	Self	.151	.146	.229	
	Subordinate	-1.035	.242	-1.017***	
	Self^2	-.023	.029	-.099	
	SelfxSubordinate	.005	.077	.019	
	Subordinate^2	.099	.075	.343	
DPB	Intercept	2.090	.233		.553
	Self	-.278	.145	-.456	
	Subordinate	-.860	.188	-.879***	
	Self^2	-.015	.028	-.068	
	SelfxSubordinate	.186	.073	.793*	
	Subordinate^2	-.039	.059	-.150	

Note: PC= Partnering with Clients, C=Collaborating, MCC= Managing Challenge and Complexity, TB= Thinking Broadly, MSD= Making Sound Decisions, TSR= Taking Strategic Risks, DT= Demonstrating Trustworthiness, EP= Enabling Performance, DO= Developing Others, DPB= Demonstrating Passion for the Business. *$p < .05$. **$p < .01$. ***$p < .001$.

Contrary to hypothesis 2, the regression coefficients were both positive and negative. Additional analysis using response surface methodology allowed for further examination of the polynomial equation and the relationship between self-other agreement and performance change. For the hypothesis to be supported, response surfaces should have a concave shape, representing an increase in gain score as self-other agreement increased. The response surface in Figure 1 illustrates the expected positive relationship between self-other agreement and performance change. The response surfaces observed are summarized in Table 6.

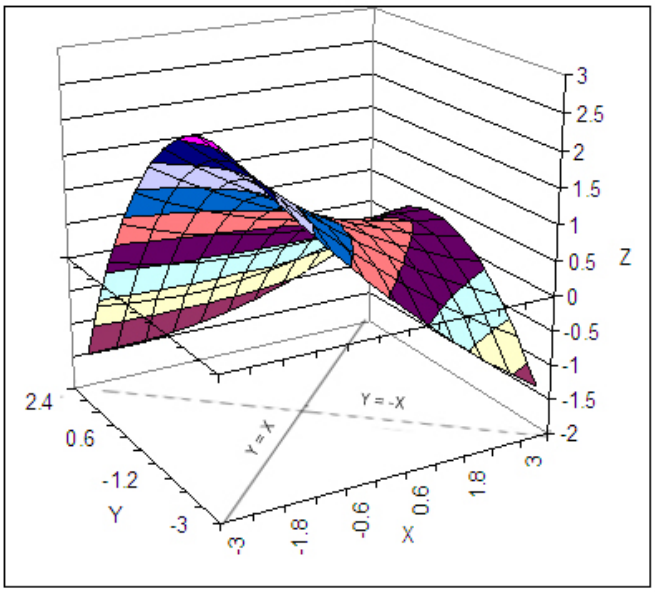

Figure 1. Expected response surface shape. Example of the expected response surface, which self (X) and other (Y) agreement relates positively with gain score (Z). Y=X line represents the plane of complete agreement. Y = -X represents the relationship of incongruence on Z.

The expected concave response surface was observed in 10 models in this study. Self and colleague agreement positively related to changes in colleague ratings on Partnering with Clients, Thinking Broadly, and Demonstrating Trustworthiness and to changes in self ratings on Demonstrating Passion for the Business. Self-subordinate agreement also positively related to changes in self ratings of Demonstrating Passion for the Business. Self-other agreement positively related to changes in manager ratings of Collaborating and Managing Challenge and Complexity as well as subordinate ratings of Taking Strategic Risks, Enabling Performance, and Demonstrating Passion for the Business. In addition to the expected response surface, five other response surfaces were observed.

Shape A. Several graphs displayed a negative slope along the Y = -X plane and along the X = -3 plane (see Figure 2 for an example). This indicated that self and other agreement related positively with gain score when self ratings were higher than other ratings and negatively when other ratings were higher than self ratings at time 1. Furthermore, this pattern suggested that agreement was positively related to performance change for under-raters but negatively related to performance change for over-raters.

This shape was observed in response surface graphs of self-manager agreement and self ratings for all competency dimensions except Making Strategic Decisions. Additionally, this pattern was found in graphs of the relationship between self-colleague agreement and self gain scores of six of the ten competency dimensions: Partnering with Clients, Collaborating, Managing Challenge and Complexity, Thinking Broadly, Taking Strategic Risks, and Developing Others.

This negative slope was also seen in graphs of the relationship between self-subordinate agreement and self gain score on a number of leadership competency dimensions. Specifically, this pattern was seen in graphs of Partnering with Clients, Collaborating, Thinking Broadly, Taking Strategic Risks, and Developing Others.

Across the different rating sources, this relationship, and therefore this shape, was consistently observed between self-other agreement and self gain score on four dimensions. These dimensions were Partnering with Clients, Collaborating, Thinking Broadly, Taking Strategic Risks, and Developing Others. This pattern was not found on graphs of other gain scores.

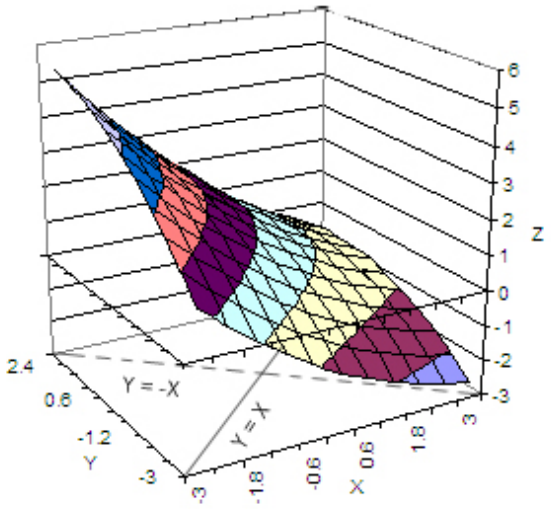

Figure 2. Shape A. Example of response surface with a negative slope along the Y = -X line, which represents the relationship of incongruence between self (X) and other (Y) on gain score (Z). Y=X line represents the plane of complete agreement. Slope along the X = -3 plane is also negative.

Shape B. Several graphs indicated a negative linear relationship between self-other agreement and self ratings. Response surfaces of these graphs also displayed a negative slope along the Y = -X plane; however, unlike Shape A (Figure 2), response surfaces showed little slope along the X = -3 plane (see Figure 3 for an example). This pattern suggested that a negative relationship existed between self ratings at time 1 and self gain score and that this pattern was the same for participants regardless of the level of self-other agreement. This relationship was observed in graphs of self-colleague agreement and self-manager agreement with self ratings of Making Strategic Decisions. It was also seen in graphs of self-subordinate agreement and self ratings of Enabling Performance, Managing Change and Complexity, and Demonstrating Passion for the Business.

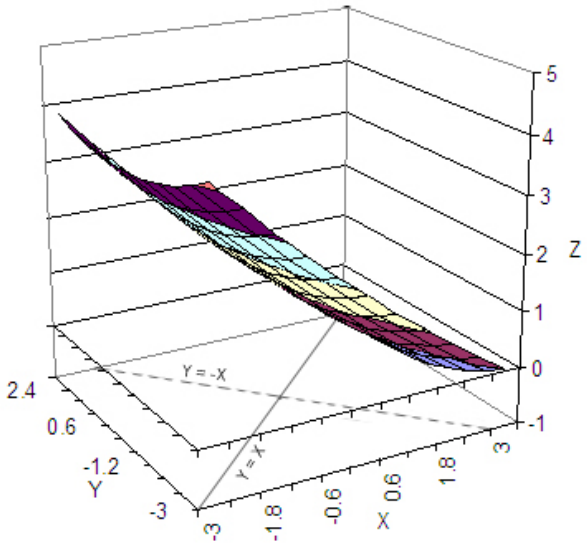

Figure 3. Shape B. Example of response surface with a negative slope along the Y = -X plane, which represents the relationship of incongruence between self (X) and other (Y) on gain score (Z) and along the Y=X plane, which represents the plane of complete agreement. Slope along the X = -3 plane is minimal.

Shape C. In addition to response surfaces with a negative slope along the Y= -X line, convex or saddle-shaped surfaces were also observed (see Figure 4 for an example). As agreement increased (along the Y = -X plane), gain score decreased. Higher gain scores were observed when self and other scores were incongruent, specifically when self ratings were higher and other ratings were low or when self ratings were low and colleague ratings were high. This surface suggested a negative relationship between self-other agreement and performance change. This relationship was found in graphs of self and subordinate agreement and changes in self ratings on Making Sound Decisions and Demonstrating Trustworthiness and subordinate ratings on Thinking Broadly. This relationship was also observed in the response surface of the relationship between self and colleague ratings and changes in self ratings on Demonstrating Trustworthiness and colleague ratings on Collaborating and Taking Strategic Risks.

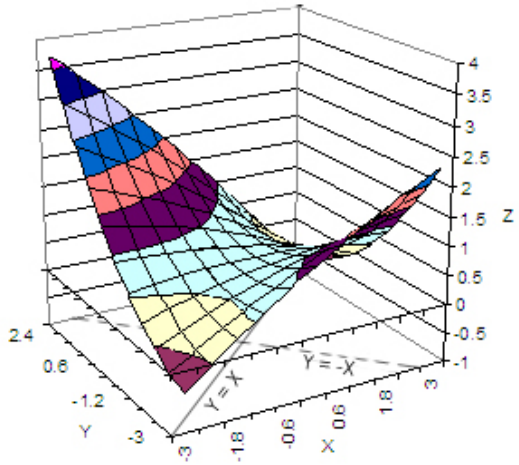

Figure 4. Shape C. Example of response surface in which self (X) and other (Y) agreement relates negatively with gain score (Z). Y=X line represents plane of complete agreement. Y = -X represents the relationship of incongruence on Z.

Shape D. The fourth shape observed displayed a positive slope along the Y = -X line in a number of instances (see Shape D in Figure 5 for an example). This indicated that self and other agreement related positively with gain score when self ratings were lower than other ratings and negatively when other ratings were lower than self ratings at time 1. This pattern suggested that gain scores were higher when participants over-rated themselves than when they under-rated themselves. Response surfaces with these characteristics were observed in graphs of self-manager agreement and manager ratings of Demonstrating Trustworthiness. It was also seen in graphs of self-colleague agreement and colleague ratings of Demonstrating Passion for the Business. Finally, this pattern was seen in graphs of self-subordinate agreement and subordinate ratings of Partnering with Clients, Collaborating, Making Sound Decisions, Demonstrating Trustworthiness, and Managing Challenge and Complexity. Conversely, this pattern was not seen in graphs of self gain score.

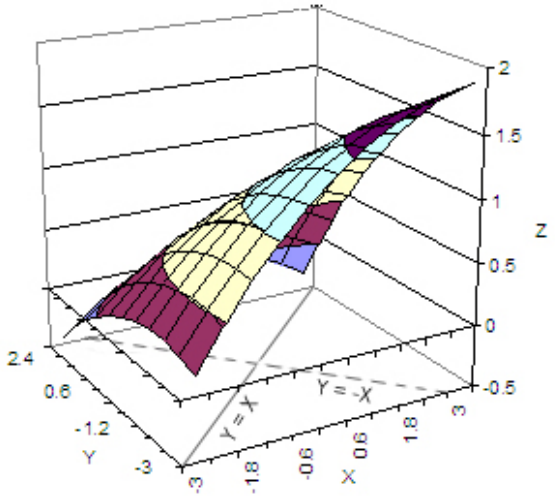

Figure 5. Shape D. Example of response surface, with a positive slope along the Y = -X line, which represents the relationship of incongruence between self (X) and other (Y) on gain score (Z). Y = X line represents plane of complete agreement.

Shape E. Several graphs indicated a positive linear relationship between self-other agreement and other ratings. While response surfaces of these graphs displayed a positive slope along the Y = -X plane similar to Figure 5, response surfaces showed little slope along the Y = -3 plane (see Figure 6 for an example). This pattern suggested that a negative relationship existed between other ratings at time 1 and other gain score and that this pattern was the same for participants regardless of the level of self-other agreement. Response surfaces with these characteristics were observed in graphs of self-manager agreement and manager ratings on seven competency dimensions: Partnering with Clients, Thinking Broadly, Making Sound Decisions, Taking Strategic Risks, Enabling Performance, Developing Others, and Demonstrating Passion for the Business. Self-colleague agreement and colleague rating responses surfaces also displayed these characteristics on graphs of Managing Challenge and Complexity, Making Strategic Decisions, Developing Others, and Enabling Performance. Additionally, the response surface of the relationship between self-subordinate agreement and subordinate ratings of Developing Others displayed this pattern. Across rating sources, this response surface shape was observed for the relationship between self-other agreement and other ratings of Developing Others.

While the results support a relationship between self-other agreement and gain score overall, the hypothesized positive relationship was not supported. Graphs of all relationships studied are included in Figures 7 through 12.

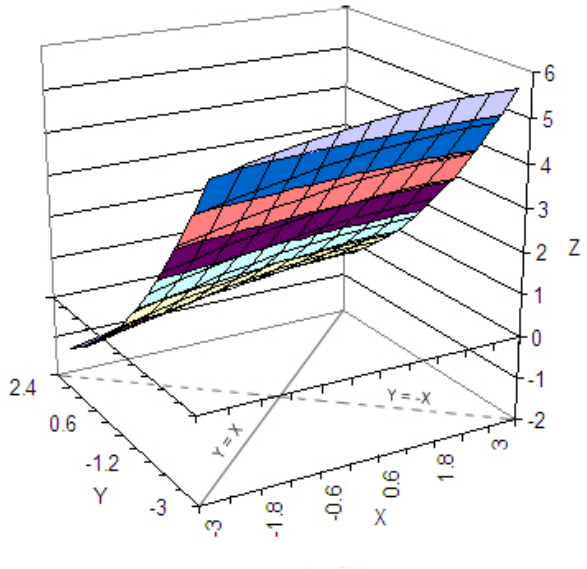

Figure 6. Shape E. Example of response surface with a positive slope along the Y = -X line, which represents the relationship of incongruence between self (X) and other (Y) on gain score (Z) and a negative slope along the Y = X line, which represents the plane of complete agreement.

Table 6.

Summary of Relationships Reflected in the Response Surfaces of Self-Other Agreement and Gain Score.

	Response surface shape	Expected		A		B		C		D		E	
	Description	Concave		Negative slope along Y = -X and X = -3 planes		Negative slope along Y = -X and minimum slope along X = -3 planes		Convex		Positive slope along Y = -X and negative slope along Y = -3		Positive slope along Y = -X and minimum slope along Y = -3	
Agreement	Gain score	Self	Other	Self	Other	Self	Other	Self	Other	Self	Other	Self	Other
Self-Manager	PC			x									x
	C		x	x									
	MCC		x	x									
	TB			x									x
	MSD							x					x
	TSR			x									x
	DT			x							x		
	EP			x									x
	DO			x									x
	DPB			x									x
Self-Colleagues	PC		x	x									
	C			x					x				
	MCC			x									x
	TB		x	x									
	MSD					x							x
	TSR			x					x				
	DT		x					x					
	EP					x							x
	DO			x									x
	DPB	x									x		
Self-Subordinates	PC			x							x		
	C			x							x		
	MCC					x					x		
	TB			x					x				
	MSD							x			x		
	TSR		x	x									
	DT							x			x		
	EP		x			x							
	DO			x									x
	DPB	x	x										

Note: PC= Partnering with Clients, C=Collaborating, MCC= Managing Challenge and Complexity, TB= Thinking Broadly, MSD= Making Sound Decisions, TSR= Taking Strategic Risks, DT= Demonstrating Trustworthiness, EP= Enabling Performance, DO= Developing Others, DPB= Demonstrating Passion for the Business. Hypothesis predicted response surface graphs to display the "expected" shape.

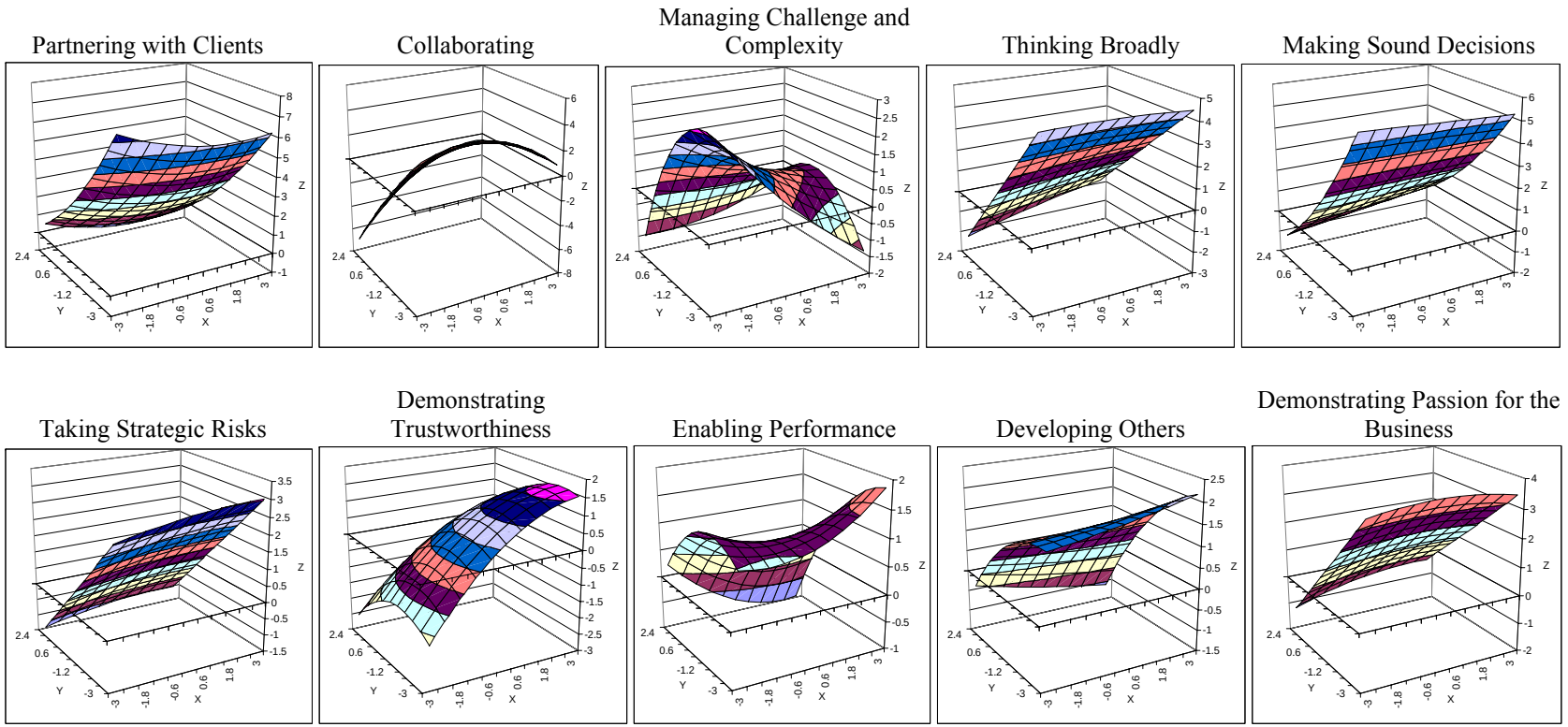

Figure 7. Relationship of self (X) and manager (Y) agreement with manager gain score (Z).

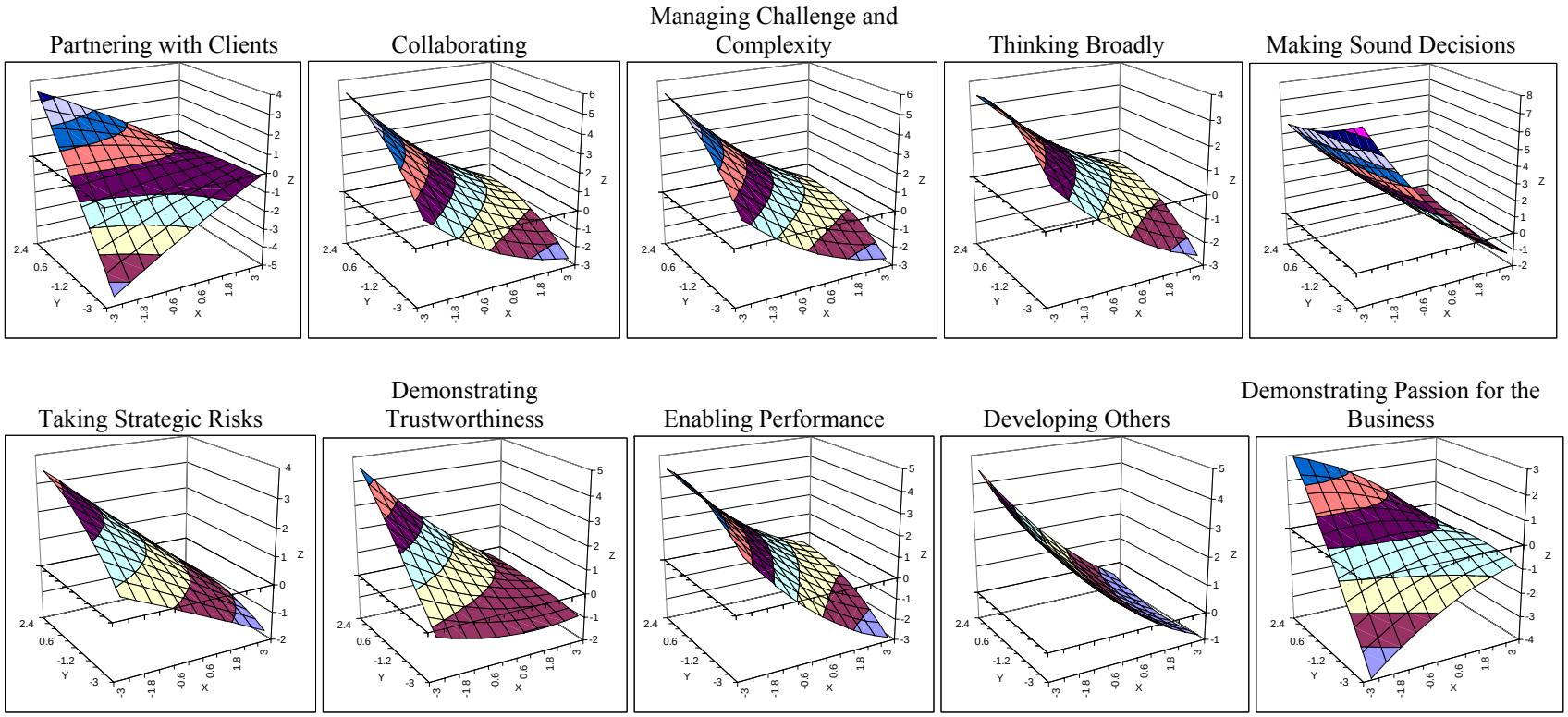

Figure 8. Relationship of self (X) and manager (Y) agreement with self gain score (Z).

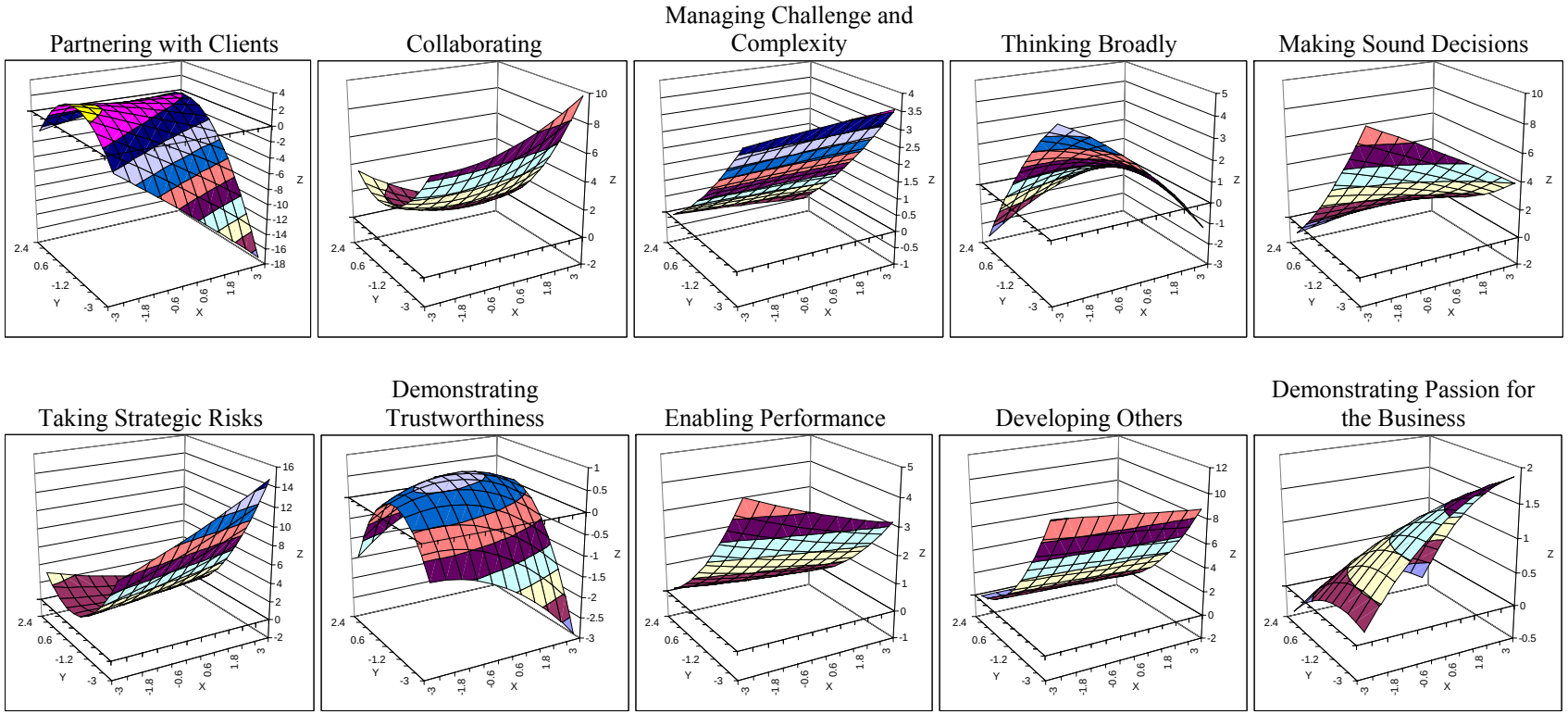

Figure 9. Relationship of self (X) and colleague (Y) agreement with colleague gain score (Z).

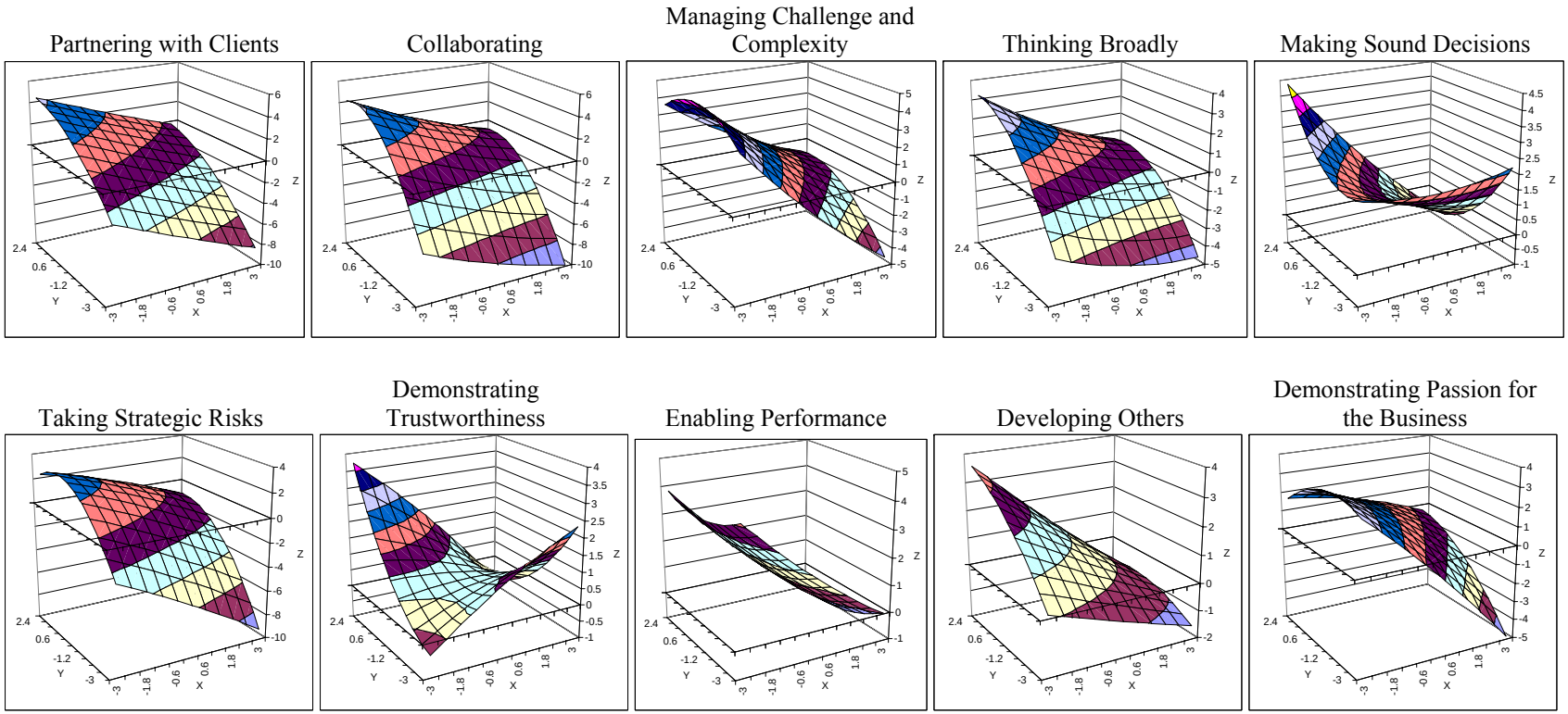

Figure 10. Relationship of self (X) and colleague (Y) agreement with self gain score (Z).

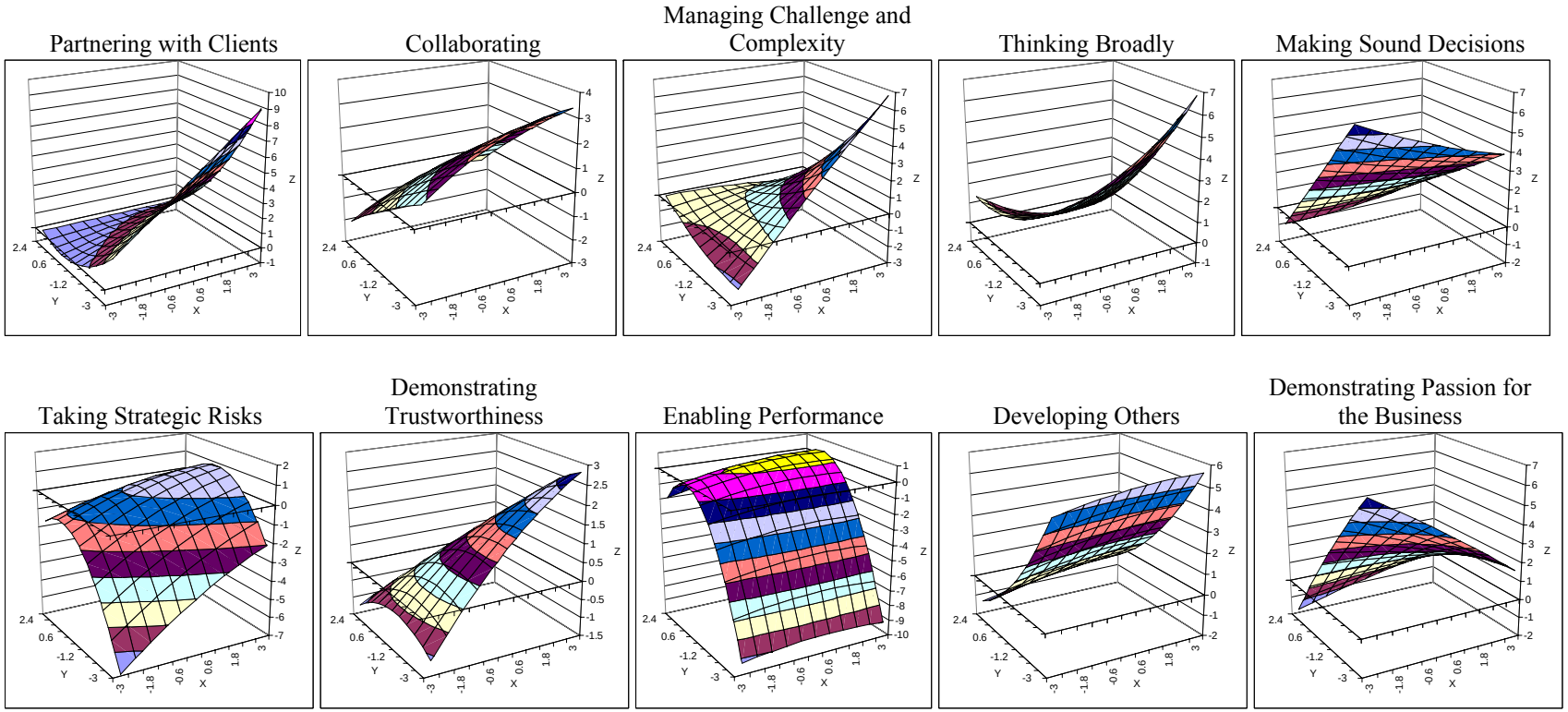

Figure 11. Relationship of self (X) and subordinate (Y) agreement with subordinate gain score (Z).

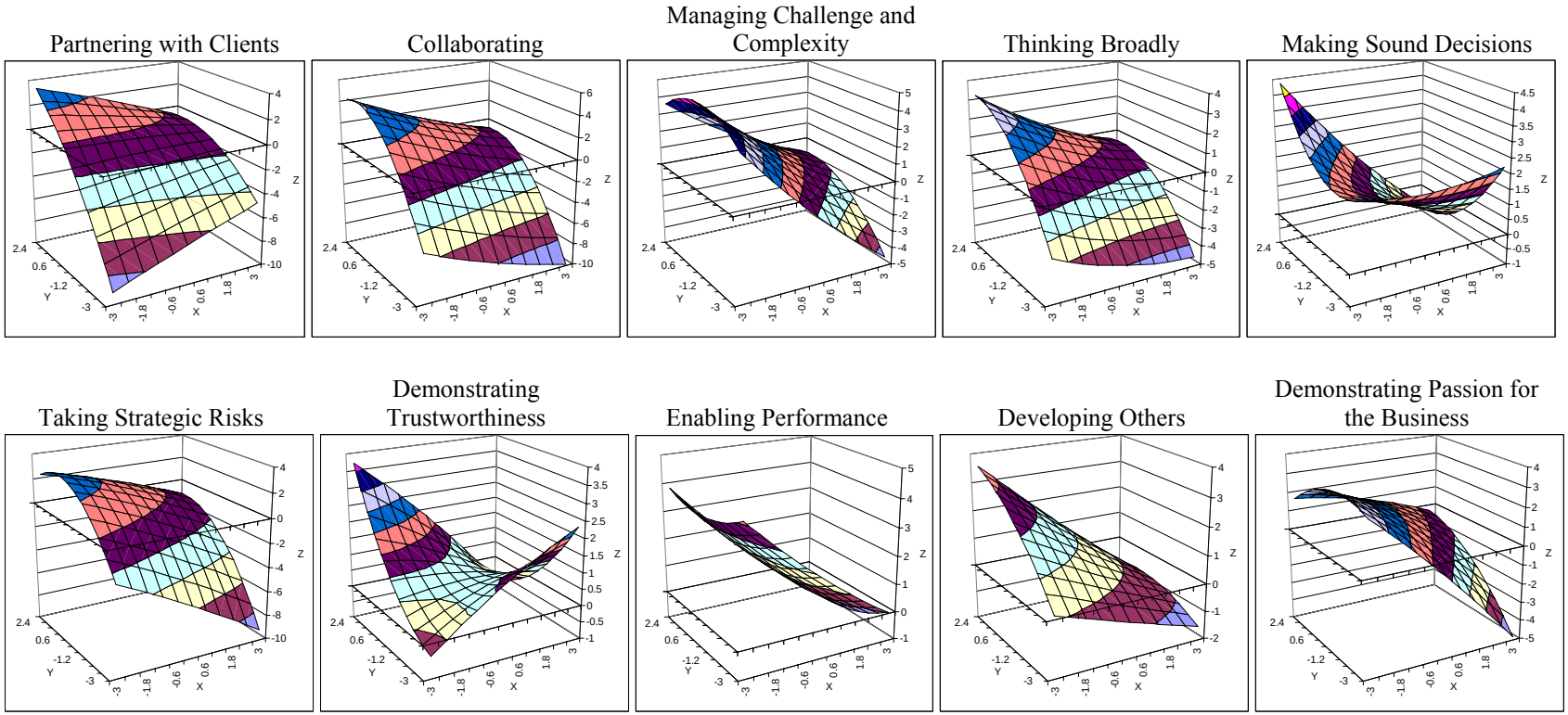

Figure 12. Relationship of self (X) and subordinate (Y) agreement with self gain score (Z).

Culture profiles

Descriptive statistics, intercorrelations, and subscale reliabilities for the Culture Value Survey are provided in Table 7. Individual culture values were studied in two ways, as separate dimensions and as profiles or types.

Cluster analysis was used to identify culture profiles or types based on standardized culture value scores. Similarity was assessed and clustered were identified using Euclidean distance determine because of its sensitivity to both shape and level differences among clusters. Based on the recommendation by Milligan (1980), a hierarchical method was used to identify the number of clusters and the cluster centers, which were then used as seed points in a non-hierarchical method.

Ward's method, which optimizes the within cluster homogeneity (Ward, 1963), was used for the hierarchical clustering. The number of clusters was determined by examining a graph of the increase in error sum of squares (ESS) as clusters were combined (Figure 13) and identifying the point at which the combination of clusters resulted in a marked increase. In solutions with more than seven clusters, the graph appeared relatively flat, which suggested minimal changes in ESS. In solutions with less than seven clusters, there was an observable increase in ESS as clusters were merged. Taken together, these suggested that the seven cluster solution is optimal.

Next, the non-hierarchical clustering was conducted using k-means cluster analysis. The cluster centers identified through Ward's method were used as initial seed points. This procedure resulted in seven culture profiles which are shown in Figure 14. In the graph,

profile means on each culture dimension are plotted and profiles are graphed as separated lines. Descriptive statistics, intercorrelations, reliabilities, and homogeneity coefficient (a between group comparison statistic) are included in Table 8.

Table 7.

Intercorrelations Between Competency Subscales and Observed Subscale Reliabilities (N=332)

Dimension	Mean	SD	IC	PD	UA	MF
IC	3.654	.625	(.682)			
PD	1.838	.576	.044	(.635)		
UA	3.781	.622	.137*	.190**	(.695)	
MF	1.674	.759	-.025	.258**	.128*	(.818)

Note: IC=Individualism/collectivism (6 items). PD=Power distance (6 items). UA=Uncertainty Avoidance (5 items). MF=Masculinity/femininity (5 items).
*p< 0.05. **p<0.01

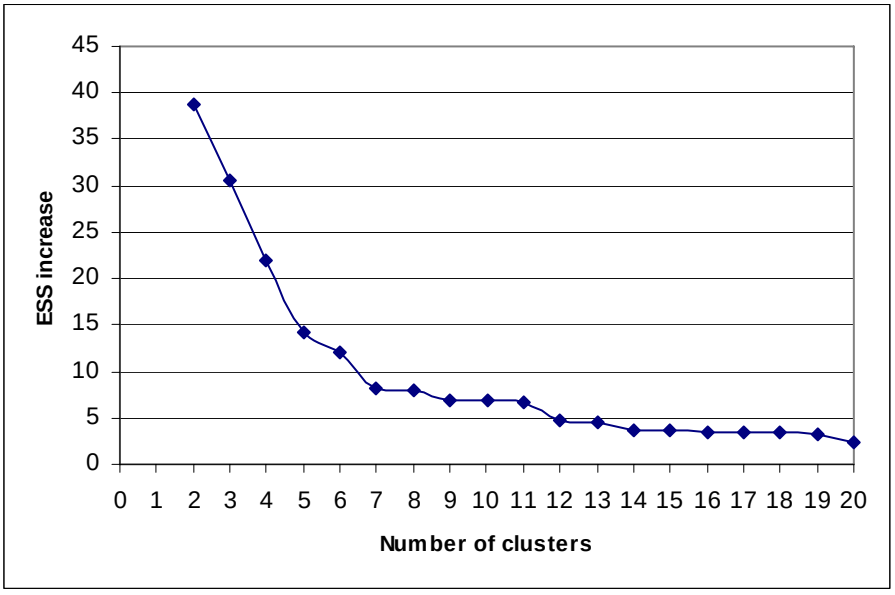

Figure 13. Error Sum of Squares increase as clusters are joined (from right to left).

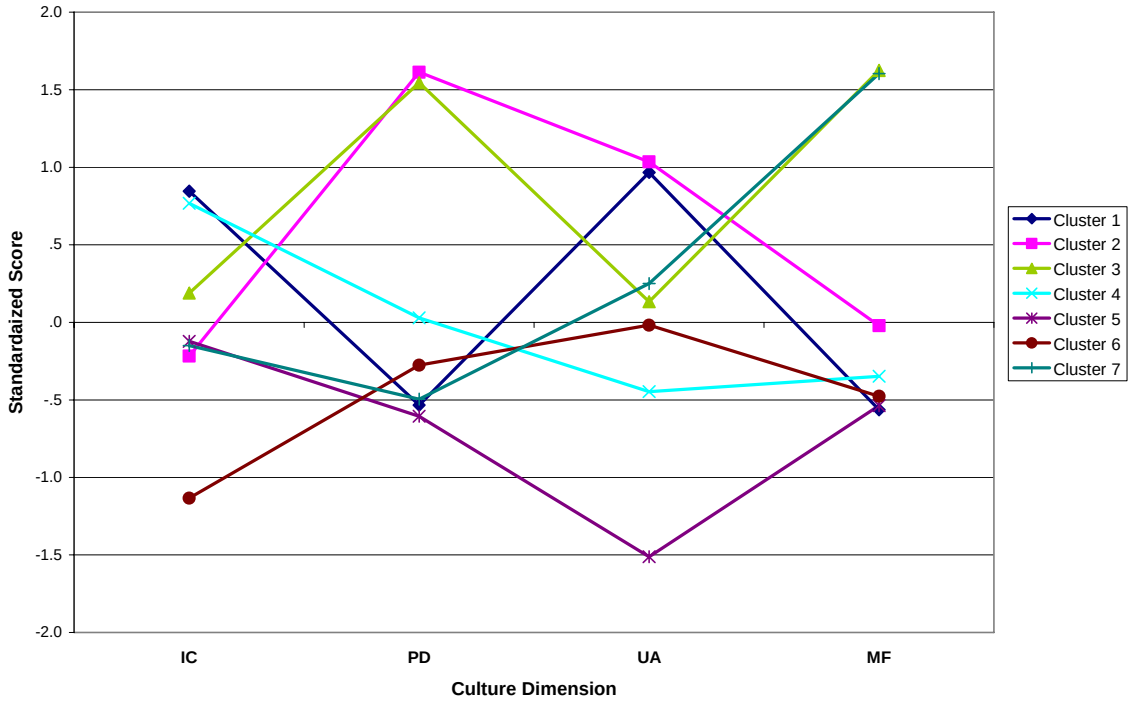

Figure 14. Standardized scores for culture dimensions by cluster.

Table 8.

Descriptive Statistics for Culture Profiles

Profile	n	IC *M (SD)*	PD *M (SD)*	UA *M (SD)*	MF *M (SD)*	Homogeneity Coefficient
1	54	4.182 (0.386)	1.528 (0.325)	4.374 (0.379)	1.236 (0.342)	0.680
2	27	3.531 (0.521)	2.704 (0.379)	4.415 (0.419)	1.630 (0.429)	1.010
3	31	3.780 (0.484)	2.667 (0.491)	3.863 (0.348)	2.826 (0.470)	1.085
4	61	4.134 (0.310)	1.836 (0.317)	3.508 (0.311)	1.393 (0.437)	0.606
5	43	3.589 (0.402)	1.488 (0.290)	2.856 (0.401)	1.256 (0.361)	0.694
6	73	2.969 (0.476)	1.669 (0.365)	3.771 (0.411)	1.300 (0.381)	0.887
7	37	3.572 (0.428)	1.550 (0.358)	3.935 (0.497)	2.811 (0.359)	0.909
Total Sample	326	3.664 (0.613)	1.821 (0.548)	3.782 (0.612)	1.646 (0.726)	
Between Group Comparison		*F*=59.200*, 6	*F*=75.193*, 6	*F*=77.813*, 6	*F*=130.218*, 6	

Note: IC = Individualism/collectivism, PD = Power Distance, UA = Uncertainty Avoidance, MF = Masculinity/femininity.
*$p < 0.001$.

The profiles identified were relevant in the context of the current study; however, the sample of this study precluded the development of a culture profile taxonomy. As such, each profile will be briefly described below.

Profile 1 was characterized as collectivist, with lower power distance, higher uncertainty avoidance and more feminine values (Figure 15). These culture values suggest that individuals in this cluster value the larger group, flatter organization structures, structured and directed work, and a nurturing environment.

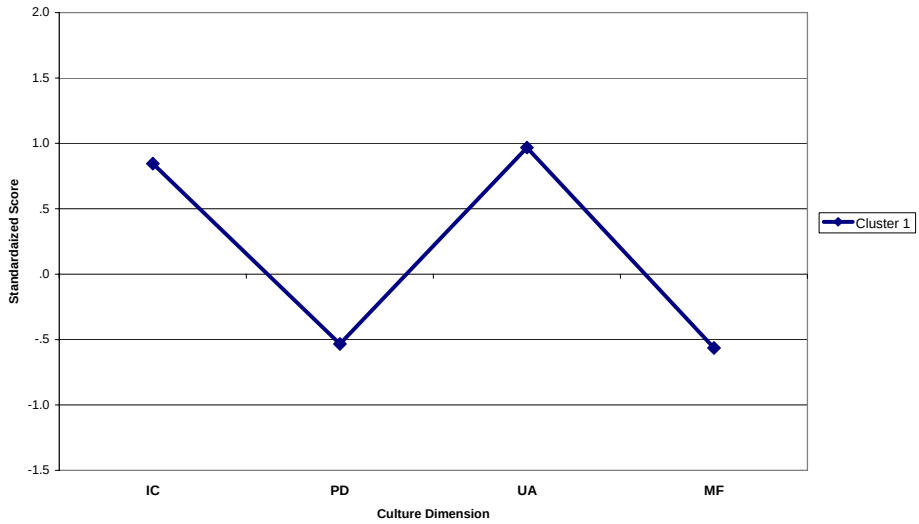

Figure 15. Standardized scores for culture dimensions for Profile 1.

Profile 2 was characterized by a slight tendency toward individualism, higher power distance, higher uncertainty avoidance and more feminine values (Figure 16). Compared to other profiles, this profile had the highest uncertainty avoidance and power distance scores. This suggests that individuals in this cluster prefer more structure and direction, as well as being more accepting of power inequality, than the other profiles.

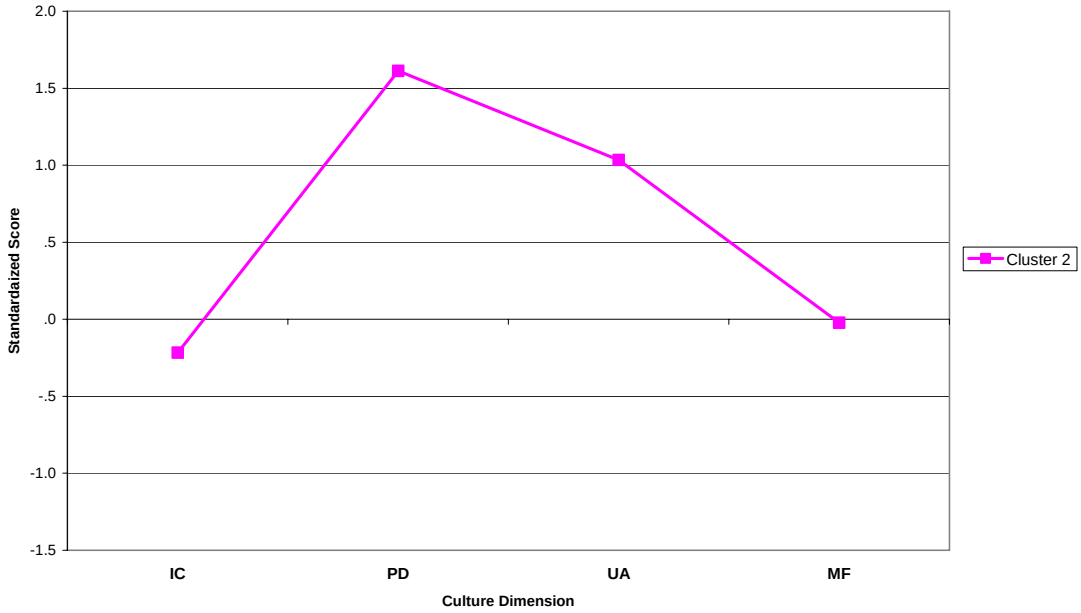

Figure 16. Standardized scores for culture dimensions for Profile 2.

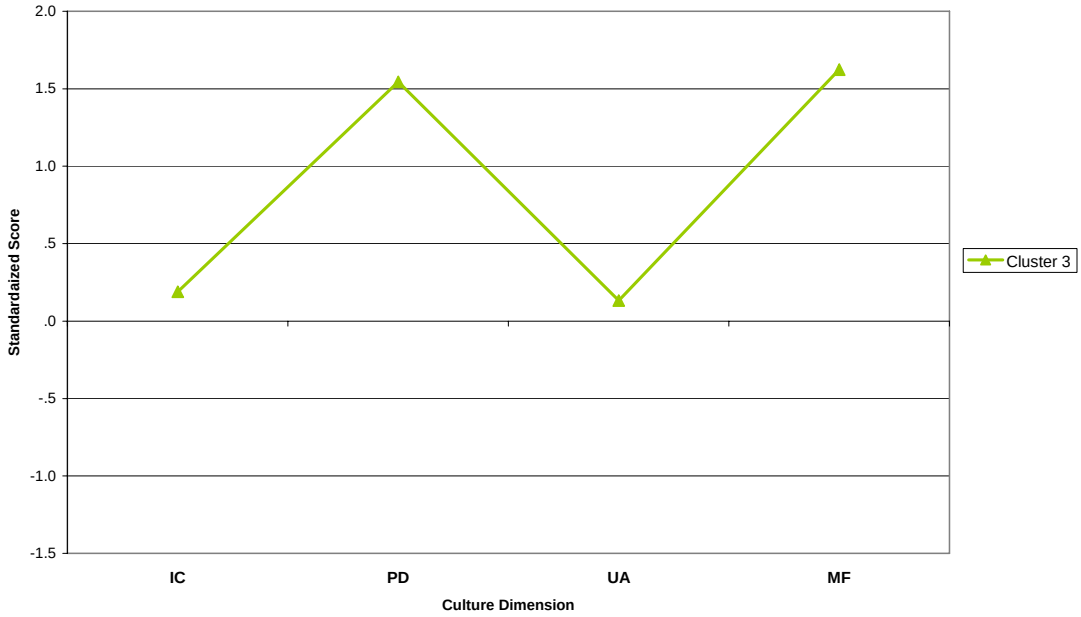

Figure 17. Standardized scores for culture dimensions for Profile 3.

Across all dimensions, Profile 3 means were above zero (Figure 17). Compared to other profiles, this cluster was characterized by slightly higher or higher scores on all culture dimensions. These culture values suggest that individuals in this cluster accept that power is unequally distributed and value a more aggressive environment.

With the exception of the individualism/collectivism dimension, Profile 4 means fall in the middle of the range of all profiles (Figure 18). On the individualism/collectivism dimension, individuals in this cluster were more collectivist than all but one other profile.

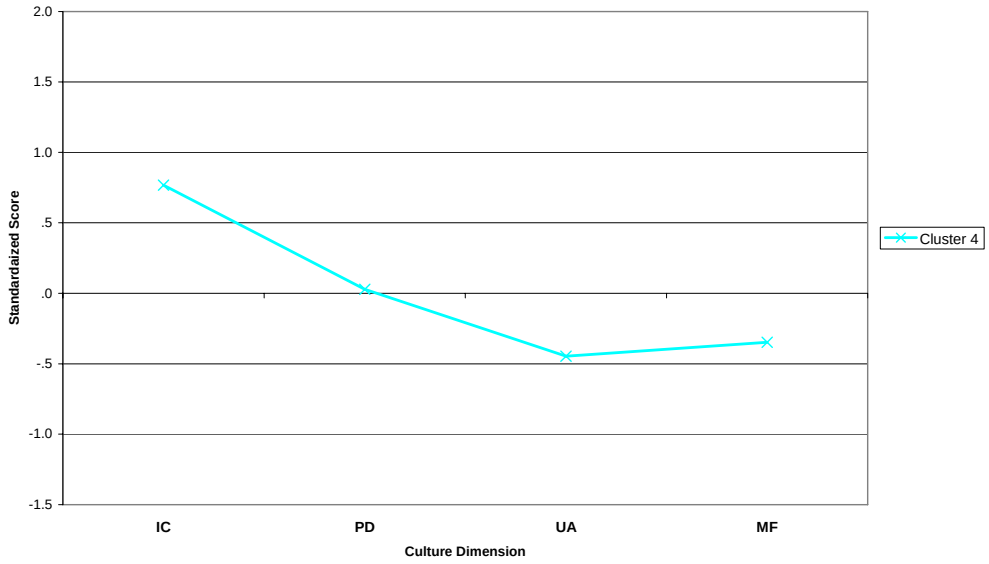

Figure 18. Standardized scores for culture dimensions for Profile 4.

Profile 5 was characterized by the lowest power distance and lowest uncertainty avoidance values of all profiles (Figure 19). Means on all dimensions were below zero. This culture profile suggests individuals value flatter organization structures and high autonomy. Additionally, individuals preferred a more nurturing organization and view both the individual and the group as important.

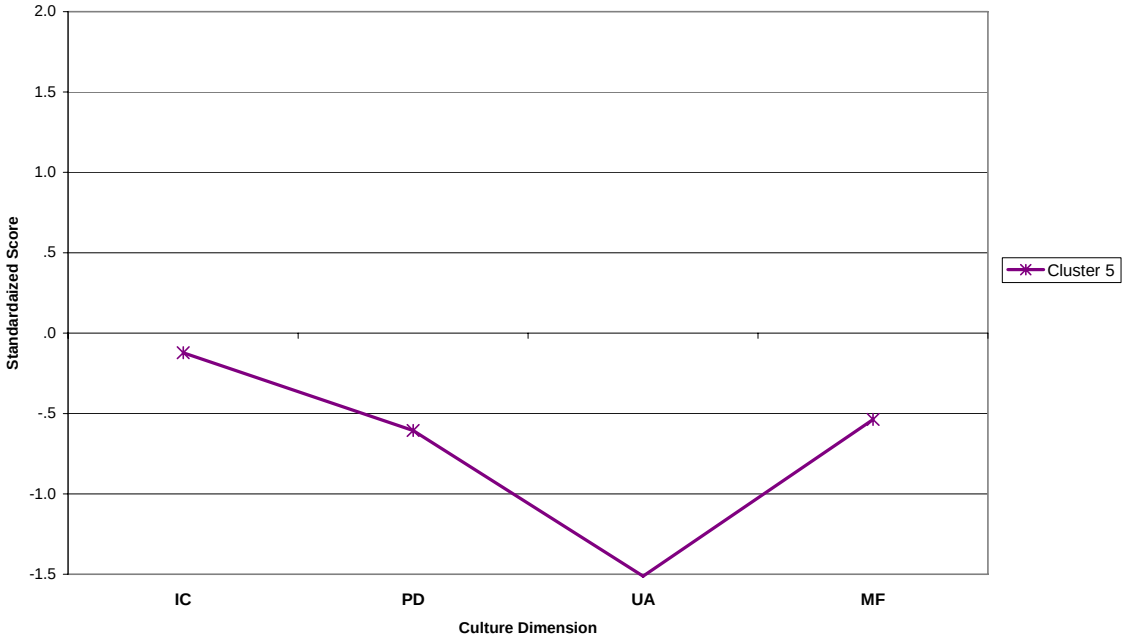

Figure 19. Standardized scores for culture dimensions for Profile 5.

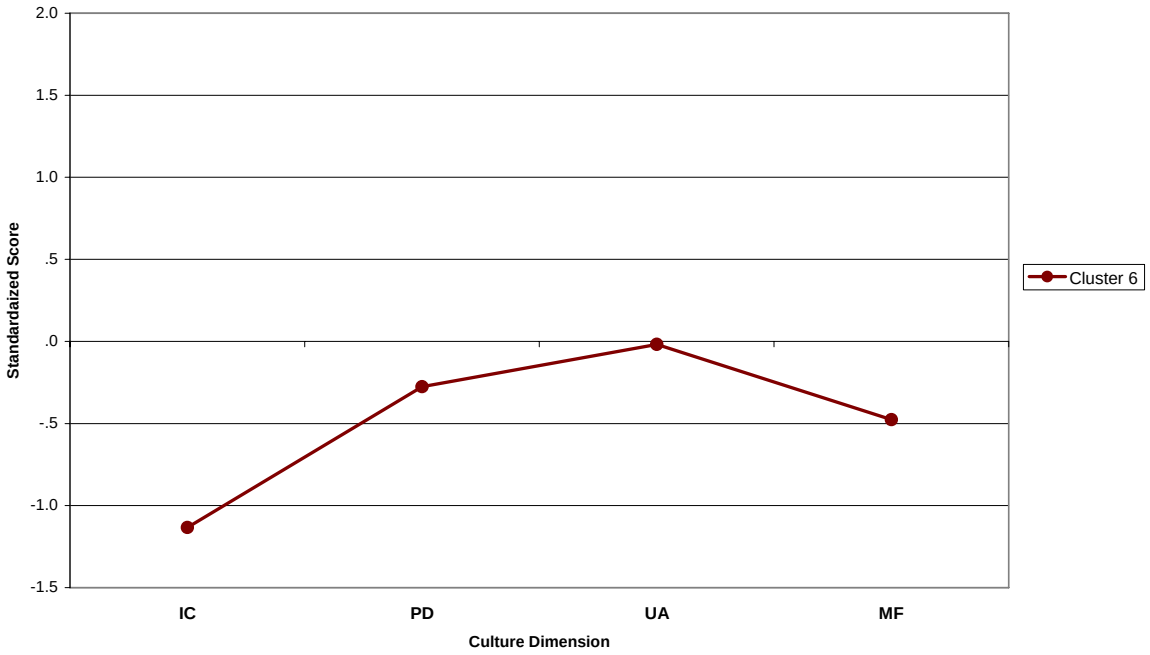

Figure 20. Standardized scores for culture dimensions for Profile 6.

Profile 6 suggests that individuals in the cluster were more individualistic (Figure 20). The profile cluster was also characterized by slight lower power distance values, mid-range uncertainty avoidance, and slightly more feminine values.

Lastly, Profile 7 had the highest masculinity-orientation, which suggests that individuals in this cluster value a more aggressive, achievement-driven environment (Figure 21). The cluster means suggest slightly more individualistic, lower power distance, and higher uncertainty avoidance values.

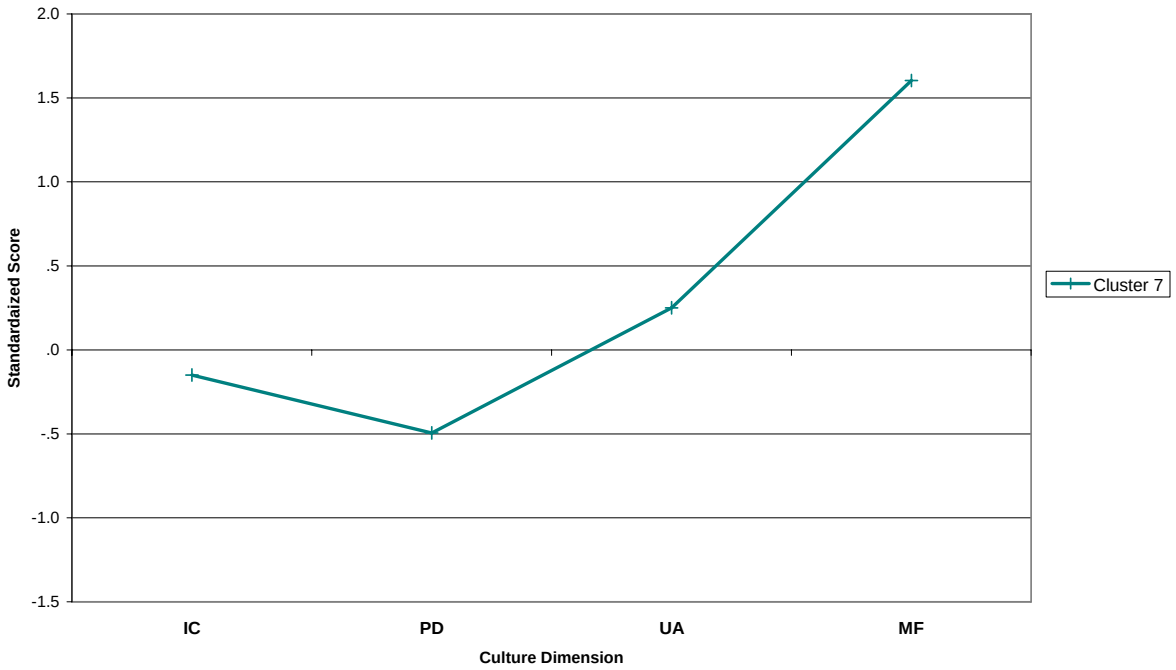

Figure 21. Standardized scores for culture dimensions for Profile 7.

Culture profile and performance change

This research question explored the relationship between culture and performance change after receiving multi-source feedback. Using culture profile as the categorical independent variable and competency dimension gain scores as dependent variables, a MANOVA was used to examine culture profile differences in performance change. Significant differences were not found for performance change in self, colleague, or subordinate ratings; however, there was a statistically significant difference between profiles on the combined dimensions for manager ratings [F (60, 444) = 1.37, p = .04, Pillai's Trace = .94, partial eta squared = .16)]. Although Wilks' Lamnda is a commonly reported multivariate test, Pillai's Trace was used here because it is robust when sample sizes are small or unequal, as was the case with these profiles (Tabachinick & Fidell, 2007).

The impact of profile on performance change was further explored using a one-way between groups analysis of variance (ANOVA) for each competency dimension. Where statistically significant differences were observed across profiles, post-hoc comparisons were conducted using the Tukey HSD test to examine mean score differences. Results from the ANOVA showed significant differences for manager ratings on three competency dimensions: Collaborating, Managing Challenge and Complexity, and Enabling Performance (at the $p < .05$ level). For each dimension, the effect sizes, calculated using eta squared, were large ($\eta^2 > .014$). Using the Bonferroni adjusted alpha level of 0.005, only the differences on Enabling Performance were significant [F (6, 78) = 3.81, p = .002, partial eta squared = .227].

The Tukey HSD test showed that the Collaborating mean score for Profile 1 was significantly different from Profile 5 and Profile 6 at the $p < .05$ level. The Enabling Performance mean score for Profile 5 differed significantly from Profile 1 and Profile 7 at the $p < .008$ and $p < .05$ levels, respectively. Thus, only the difference between Profiles 5 and 1 were significant at the Bonferroni adjusted alpha level of .008.

Self, colleague, and subordinate ratings of performance change did not significantly differ across the seven profiles.To simplify interpretation of these analyses, the significant results are summarized in Table 9.

Table 9.

Summary of Significant Relationships between Culture Profile and Gain Score.

	ANOVA		Tukey HSD post-hoc		
	Competency	Model fit	Profiles with significantly different gain score means (Mean, Standard Deviation)		
Self	-				
Manager	Collaborating	F (6, 82) = 2.435*	Profile 1 (M = -.625, SD = .878)	and	Profile 5 (M = .414, SD = .811) * Profile 6 (M = .304, SD = .817) *
	Managing Challenge and Complexity	F (6, 82) = 2.321*	-		
	Enabling Performance	F (6, 80) = 3.985**	Profile 5 (M = .728, SD = .899)	and	Profile 1 (M = -.557, SD = 1.00) ** Profile 7 (M = -.938, SD = .869)*
Colleague	-				
Subordinate	-				

Note: *$p < .05$. **$p < .005$.

Culture dimensions and performance change

Linear regression was used to explore the predictive relationship between culture dimensions and performance change. Since a linear relationship between culture and performance change could not be assumed, polynomial regression was also used because it provided alternative mean functions for the data to fit (Cook & Weisberg, 1999). Each culture dimension was operationalized as the average of scores from the corresponding items on the culture survey and was treated as a continuous variable.

Linear regression: $Y \text{ (gain score)} = b_0 + b_1(\text{dimension}) + e$ (3)

Polynomial regression: $Y(\text{gain score}) = b_0 + b_1(\text{dimension}) + b_2(\text{dimension})^2 + e$ (4)

Separate analyses were conducted for each culture dimension and each rating source. Individualism/collectivism was only predictive of change in manager ratings of the Collaborating dimension [F (1,81) = 5.24, p = .025]. As hypothesized, the relationship between this dimension and manager ratings of performance change was found to be negative and linear (β = -.247, $p < .05$). Individualism/collectivism did not predict changes in ratings by self, colleagues, or subordinates. Overall, hypothesis 3a was not supported.

Power distance did not significantly predict performance change on any of the dimensions. Hypothesis 3b was not supported for any of the rating sources.

With the exception of Enabling Performance, uncertainty avoidance predicted subordinate performance ratings across all dimensions. As hypothesized, uncertainty avoidance positively related to gain score. Consequently, as uncertainty avoidance increased, gain score increased. Results of the linear and polynomial regression tests are presented in

Table 10. The amount of gain score variance explained by the addition of uncertainty avoidance ranged from 4.5% for Taking Strategic Risks to 7.2% for Thinking Broadly. Regression coefficients for quadratic terms in the polynomial regression tests were not significant which supports the observed linear relationship.

Uncertainty avoidance also predicted the change in manager ratings of performance on three dimensions: Collaborating, Managing Challenge and Complexity, and Enabling Performance competency dimensions. Results of the linear and polynomial regression tests are presented in Table 11. Contrary to the hypothesis, uncertainty avoidance was negatively related to gain score on these dimensions. This indicates that gain scores decreased as uncertainty avoidance increased.

Uncertainty avoidance did not significantly predict self or colleague rating changes on any dimension. Taken collectively, these findings support hypothesis 3c for ratings by subordinates but not consistently for ratings by self, colleagues, or managers.

Table 10.

Regression Tests of the Relationship between Subordinate Gain Score and Uncertainty Avoidance

Dimension		Linear				Polynomial			
	Predictors	B	SE	β	R^2	B	SE	β	R^2
PC	Intercept	-0.516	0.251		0.050	-0.081	0.065		0.052
	UA	0.146	0.066	0.223*		0.195	0.122	0.298	
	UA^2					-0.036	0.076	-0.089	
			F (1, 93) = 4.858*				F (2, 92) = 2.523		
C	Intercept	-0.760	0.256		0.057	-0.098	0.093		0.063
	UA	0.222	0.094	0.239*		0.330	0.173	0.355*	
	UA^2					-0.080	0.107	-0.139	
			F (1, 93) = 5.614*				F (2, 92) = 3.073		
MCC	Intercept	-0.762	0.395		0.055	-0.041	0.102		0.063
	UA	0.242	0.104	0.235*		0.380	0.191	0.369	
	UA^2					-0.102	0.119	-0.160	
			F (1, 93) = 5.441*				F (2, 92) = 3.083		
TB	Intercept	-0.784	0.338		0.072	-0.072	0.088		0.081
	UA	0.239	0.089	0.269**		0.366	0.163	0.412*	
	UA^2					-0.094	0.102	-0.171	
			F (1, 93) = 7.247**				F (2, 92) = 4.049*		
MSD	Intercept	-0.681	0.334		0.056	-0.068	0.087		0.063
	UA	0.206	0.088	0.236*		0.323	0.162	0.371*	
	UA^2					-0.087	0.101	-0.160	
			F (1, 93) = 5.490*				F (2, 92) = 3.111*		
TSR	Intercept	-0.755	0.382		0.045	-0.134	0.098		0.064
	UA	0.209	0.100	0.212*		0.420	0.184	0.424*	
	UA^2					-0.156	0.114	-0.254	
			F (1, 93) = 4.357*				F (2, 92) = 3.134*		
DT	Intercept	-0.686	0.383		0.047	-0.045	0.099		0.059
	UA	0.215	0.101	0.217*		0.382	0.185	0.384*	
	UA^2					-0.124	0.115	-0.200	
			F (1, 93) = 4.579*				F (2, 92) = 2.872		
EP	Intercept	-0.227	0.362		0.007	0.007	0.094		0.020
	UA	0.079	0.095	0.086		0.236	0.175	0.256	
	UA^2					-0.116	0.109	-0.202	
			F (1, 93) = .699				F (2, 92) = .918		
DO	Intercept	-0.826	0.402		0.057	-0.083	0.103		0.078
	UA	0.250	0.106	0.239*		0.485	0.193	0.463*	
	UA^2					-0.174	0.120	-0.267	
			F (1, 93) = 5.620*				F (2, 92) = 3.896*		
DPB	Intercept	-0.706	0.345		0.064	-0.025	0.089		0.075
	UA	0.229	0.091	0.253*		0.373	0.166	0.413*	
	UA^2					-0.107	0.104	-0.190	
			F (1, 93) = 6.377*				F (2, 92) = 3.723*		

Note: *$p < .05$. **$p < .01$.

Table 11.

Regression Tests of the Relationship between Manager Gain Score and Uncertainty Avoidance

Dimension		Linear				Polynomial			
	Predictors	B	SE	β	R^2	B	SE	β	R^2
PC	Intercept	1.078	0.525		0.039	0.325	0.143		0.053
	UA	-0.246	0.136	-0.197		0.010	0.268	0.008	
	UA^2					-0.177	0.159	-0.238	
			F (1, 81) = 3.278				F (2, 80) = 2.258		
C	Intercept	1.326	0.597		0.052	0.332	0.161		0.081
	UA	-0.324	0.154	-0.227*		0.094	0.301	0.066	
	UA^2					-0.289	0.179	-0.340	
			F (1, 81) = 4.412*				F (2, 80) = 3.545*		
MCC	Intercept	1.347	0.537		0.072	0.296	0.146		0.079
	UA	-0.347	0.139	-0.268*		-0.162	0.274	-0.125	
	UA^2					-0.128	0.163	-0.166	
			F (1, 81) = 6.257*				F (2, 80) = 3.422*		
TB	Intercept	0.802	0.860		0.014	0.243	0.179		0.034
	UA	-0.180	0.171	-0.116		0.199	0.335	0.128	
	UA^2					-0.262	0.200	-0.284	
			F (1, 81) = 1.109				F (2, 80) = 1.418		
MSD	Intercept	0.871	0.478		0.026	0.325	0.131		0.026
	UA	-0.182	0.124	-0.162		-0.190	0.245	-0.169	
	UA^2					0.005	0.146	0.008	
			F (1, 81) = 2.174				F (2, 80) = 1.075		
TSR	Intercept	0.592	0.658		0.010	0.122	0.180		0.015
	UA	-0.153	0.170	-0.100		0.026	0.337	0.017	
	UA^2					-0.124	0.201	-0.135	
			F (1, 81) = .813				F (2, 80) = .594		
DT	Intercept	-0.044	0.042		0.001	0.078	0.149		0.002
	UA	0.042	0.141	0.033		0.110	0.280	0.086	
	UA^2					-0.047	0.167	-0.062	
			F (1, 81) = .089				F (2, 80) = .083		
EP	Intercept	1.173	0.601		0.050	0.219	0.162		0.050
	UA	-0.318	0.156	-0.223*		-0.355	0.305	-0.249	
	UA^2					0.026	0.186	0.030	
			F (1, 81) = 4.153*				F (2, 80) = 2.061		
DO	Intercept	0.312	0.649		0.003	0.051	0.176		0.004
	UA	-0.088	0.166	-0.058		-0.126	0.328	-0.084	
	UA^2					0.028	0.201	0.030	
			F (1, 81) = .270				F (2, 80) = .143		
DPB	Intercept	0.884	0.468		0.021	0.399	0.128		0.021
	UA	-0.161	0.121	-0.146		-0.142	0.240	-0.129	
	UA^2					-0.013	0.143	-0.020	
			F (1, 81) = 1.768				F (2, 80) = .877		

Note: *$p < .05$.

Masculinity/femininity values negatively related to changes in self ratings of Demonstrating Trustworthiness ($\beta = -.207$, $p < .05$). This indicated that gain scores on this dimension decreased as masculinity/femininity values increased. Regression tests were not significant for the other competency dimensions.

Masculinity/femininity values predicted changes in manager ratings of performance on all dimensions except Collaborating, Taking Strategic Risks, and Demonstrating Trustworthiness. Results of the linear and polynomial regression tests are presented in Table 12 and indicate a curvilinear relationship between the masculinity/femininity values and gain scores. Across all competency dimensions, the resulting regression coefficients for the polynomial equation were negative. This relationship was characterized by a gain score which increased as masculinity/femininity values increased but only to a certain point. After that point, gain scores decreased as masculinity/femininity values continued to increase.

Masculinity/femininity values did not predict changes in ratings by colleagues or subordinates on any competency dimensions. Overall, only the relationship between masculinity/femininity values and manager ratings of performance were supported by these findings.

Table 12.

Regression Tests of the Relationship between Manager Gain Score and Masculinity/Femininity

Dimension		Linear				Polynomial			
	Predictors	B	SE	β	R^2	B	SE	β	R^2
PC	Intercept	0.301	0.258		0.006	-0.856	0.362		0.120
	MF	-0.111	0.165	-0.074		-1.992	0.604	-1.336**	
	MF^2					-0.773	0.240	-1.306**	
			F (1, 81) = .451				F (2, 80) = 5.442		
C	Intercept	0.086	0.296		0.000	-0.210	0.438		0.012
	MF	0.004	0.189	0.002		-0.697	0.732	-0.409	
	MF^2					-0.288	0.291	-0.426	
			F (1, 81) = 0.00				F (2, 80) = .492		
MCC	Intercept	0.312	0.267		0.018	-0.898	0.385		0.076
	MF	-0.197	0.171	-0.127		-1.611	0.644	-1.039*	
	MF^2					-0.581	0.256	-0.944*	
			F (1, 81) = 1.329				F (2, 80) = 3.283*		
TB	Intercept	0.155	0.321		0.000	-0.998	0.447		0.127
	MF	-0.026	0.205	-0.014		-2.481	0.747	-1.342**	
	MF^2					-1.010	0.297	-1.375**	
			F (1, 81) = .016				F (2, 80) = 5.806**		
MSD	Intercept	0.163	0.234		0.000	-0.311	0.339		0.052
	MF	0.010	0.150	0.007		-1.137	0.567	-0.844*	
	MF^2					-0.471	0.225	-0.881*	
			F (1, 81) = .004				F (2, 80) = 2.196		
TSR	Intercept	-0.190	0.319		0.005	-0.309	0.467		0.036
	MF	0.135	0.204	0.073		-1.060	0.781	-0.576	
	MF^2					-0.491	0.310	-0.673	
			F (1, 81) = .439				F (2, 80) = 1.480		
DT	Intercept	-0.153	0.262		0.015	0.041	0.386		0.035
	MF	0.184	0.166	0.121		-0.634	0.645	-0.418	
	MF^2					-0.336	0.256	-0.557	
			F (1, 81) = 1.206				F (2, 80) = .237		
EP	Intercept	0.386	0.291		0.029	-1.088	0.418		0.081
	MF	-0.287	0.186	-0.171		-1.703	0.701	-1.013*	
	MF^2					-0.585	0.280	-0.872*	
			F (1, 81) = 2.372				F (2, 80) = 3.421*		
DO	Intercept	-0.032	0.311		0.000	-0.859	0.438		0.088
	MF	0.008	0.198	0.005		-1.941	0.735	-1.103*	
	MF^2					-0.802	0.292	-1.147**	
			F (1, 81) = .002				F (2, 80) = 3.770*		
DPB	Intercept	0.378	0.229		0.003	-0.365	0.330		0.062
	MF	-0.074	0.148	-0.056		-1.264	0.551	-0.960*	
	MF^2					-0.490	0.219	-0.936*	
			F (1, 81) = .255				F (2, 80) = 2.633		

Note: *p < .05. **p < .01. ***p < .001.

Culture as a moderator between self-other rating agreement and performance change

This research question examined culture as a moderator of the relationship between self-other discrepancy and performance change. Culture was analyzed using culture dimensions and culture profiles. Gains in self and other ratings were tested separately and the influence of self-other agreement was controlled through the use of hierarchical regression. The general formula used was derived from Edwards (1994).

$$Y= b_0 + b_1(\text{self}) + b_2(\text{other}) + b_3(\text{self})^2 + b_4(\text{self x other}) + b_5(\text{other})^2 + b_6(\text{culture}) + b_7(\text{culture x self}) + b_8(\text{culture x other}) + b_9(\text{culture x self}^2) + b_{10}(\text{culture x self x other}) + b_{11}(\text{culture x other}^2) + e \quad (5)$$

Culture dimensions. Separate analyses were conducted for each culture dimension using the general equation for both self and other gain scores. Analyses with significant R^2 changes (at the $p < .05$ level) are presented in Table 13.

Individualism/collectivism moderated the relationship between self-manager agreement and self ratings of performance for Demonstrating Passion for the Business. The same relationship was found between self-subordinate agreement and self ratings on this dimension. No other significant relationships were found.

Power distance was found to moderate a number of relationships. The moderated relationships between self-manager agreement and manager ratings for Partnering with Clients and Taking Strategic Risks were significant. Additionally, the moderated relationship between self-manager agreement and self rating was also significant for Managing Change

and Complexity, Demonstrating Trustworthiness, Enabling Performance, and Demonstrating Passion for the Business.

Power distance was found to moderate the relationship between self-colleague and self-subordinate agreement on self ratings. The inclusion of power distance significantly increased model fit for the self-colleague relationship and the self-subordinate relationship with self gain scores on Thinking Broadly and Demonstrating Passion for the Business. Further, the relationship between self-colleague agreement and self ratings increased on Demonstrating Trustworthiness.

Uncertainty avoidance was found to moderate the relationship between self-other agreement and self ratings of on two dimensions. Specifically, the addition of uncertainty avoidance significantly improved the model fit for self-colleague agreement and self ratings of Developing Others and for self-subordinate agreement and self ratings of Demonstrating Passion for the Business. Further, uncertainty avoidance moderated the relationship between self-colleague agreement and colleague ratings on Demonstrating Passion for the Business. Uncertainty avoidance also moderated the relationship between self-other agreement and other ratings on Thinking Broadly and Making Sound Decisions for managers and subordinates. Further, uncertainty avoidance was found to moderate the relationship between self-subordinate agreement and subordinate ratings on Collaborating, Demonstrating Trust, and Developing Others.

Masculinity/femininity only moderated the relationship between self-other agreement and performance change in a few cases. This dimension moderated the relationship between

self-colleague and self-subordinate agreement on self ratings of Demonstrating Passion for the Business. Additionally, it also moderated the relationship between self-manager agreement and manager ratings of this competency dimension. Finally, the relationship between self-manager agreement and self ratings of Demonstrating Trustworthiness was also moderated by the masculinity/femininity dimension.

Table 13.

R^2 Change from Hierarchical Regression Test of the Relationship between Self-Other Agreement and Gain Scores Moderated by Culture Dimension

Gain Score		Self				Other			
Culture Dimension		IC	PD	UA	MF	IC	PD	UA	MF
Competency dimension:									
Self-Manager	PC	-	-	-	-	-	.09*	-	-
	C	-	-	-	-	-	-	-	-
	MCC	-	.11*	-	-	-	-	-	-
	TB	-	-	-	-	-	-	.07*	-
	MSD	-	-	-	-	-	-	.09*	-
	TSR	-	-	-	-	-	.11*	-	-
	DT	-	.15**	-	.14*	-	-	-	-
	EP	-	.16**	-	-	-	-	-	-
	DO	-		-	-	-	-	-	-
	DPB	.11*	.13*	-	-	-	-	-	.13**
Self- Colleague	PC	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-
	MCC	-	-	-	-	-	-	-	-
	TB	-	.08*	-	-	-	-	-	-
	MSD	-	-	-	-	-	-	-	-
	TSR	-	-	-	-	-	-	-	-
	DT	-	.11**	-	-	-	-	-	-
	EP	-	-	-	-	-	-	-	-
	DO	-	-	.07*	-	-	-	-	-
	DPB	-	.07*	-	.08*	-	-	.09*	-
Self-Subordinate	PC	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	.12**	-
	MCC	-	-	-	-	-	-	-	-
	TB	-	.13*	-	-	-	-	.12***	-
	MSD	-	-	-	-	-	-	.12**	-
	TSR	-	-	-	-	-	-	-	-
	DT	-	-	-	-	-	-	.07*	-
	EP	-	-	-	-	-	-	-	-
	DO	-	-	-	-	-	-	.09*	-
	DPB	.09*	.08*	.11**	.08*	-	-	-	-

Note: For clarity, only R^2 changes with significant F changes are presented.

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

Table 14.

R^2 Change from Regression Test of the Relationship Between Self-Other Agreement and Gain Score Moderated by Culture Profile

	Gain Score	Self	Other
Agreement	Dimension	ΔR^2	ΔR^2
Self-Manager	Partnering with Clients	.041	.070*
	Collaborating	.052	.059
	Managing Change and Complexity	.031	.098*
	Thinking Broadly	.045	.092**
	Making Sound Decisions	.044	.075*
	Taking Strategic Risks	.057	.039
	Demonstrating Trustworthiness	.018	.038
	Enabling Performance	.054	.139**
	Developing Others	.033	.017
	Demonstrating Passion for the Business	.120**	.023
Self-Colleagues	Partnering with Clients	.023	.037
	Collaborating	.012	.033
	Managing Change and Complexity	.013	.010
	Thinking Broadly	.017	.014
	Making Sound Decisions	.013	.015
	Taking Strategic Risks	.012	.041
	Demonstrating Trustworthiness	.020	.059
	Enabling Performance	.030	.010
	Developing Others	.027	.017
	Demonstrating Passion for the Business	.051	.030
Self-Subordinates	Partnering with Clients	.013	.071
	Collaborating	.040	.064
	Managing Change and Complexity	.020	.064*
	Thinking Broadly	.027	.079*
	Making Sound Decisions	.003	.107**
	Taking Strategic Risks	.014	.062
	Demonstrating Trustworthiness	.014	.028
	Enabling Performance	.047	.039
	Developing Others	.043	.035
	Demonstrating Passion for the Business	.084*	.056

Note: **F* changes are significant at the **p* < .05 level. ** *F* changes are significant at the *p* < .01 level.

All model fit statistics are significant at the *p* < .001 level.

Culture profiles. All profiles were dummy-coded into a single variable. Results suggest that the inclusion of the culture profile variable significantly improved the fit of the model in a number of analyses. Culture profile was found to moderate the relationship between self-manager agreement and self gain score and self-subordinate agreement and self gain score on Demonstrating Passion for the Business. It was also found to moderate the relationships between self-subordinate agreement and subordinate gain scores on Managing Change and Complexity, Thinking Broadly, and Making Sound Decisions. Similar to subordinate gain scores, culture profile also moderated the relationship between self-manager agreement and manager gain scores on Managing Change and Complexity, Thinking Broadly, and Making Sound Decisions. It was also found to moderate the relationship on Partnering with Clients and Enabling Performance.

Culture profile did not moderate the relationship between self-colleague agreement and self or colleague gain scores on any competency dimension. Changes in R^2 for all analyses are presented in Table 14.

To provide further insight into profile differences, pair-wise comparisons were also conducted. While this method was less than ideal given the number of culture profiles found in this study, it allowed for the examination of difference between specific profiles. Binary dummy variables were used to represent the different profiles in the analysis. Analyses with R^2 changes which were significant at the $p < .05$ level are presented separately for each profile in Tables 15 through 21.

Profile 1 differed from Profiles 2, 3, and 5 on a number of competency dimensions. Analysis of self ratings for Profiles 1 and 2 suggest that culture profile moderated the relationship with self-manager agreement on Collaborating, Managing Complexity and Challenge and Taking Strategic Risks. Profile also moderated the relationship between self-manager agreement and self ratings on all dimensions except Thinking Broadly and Enabling Performance when analyzing Profiles 1 and 3. Finally, culture profile moderated the relationship between self-subordinate agreement and subordinate ratings on all dimensions except Partnering with Clients when analyzing Profiles 1 and 5.

Analysis of Profiles 2 and 3 suggested that culture profile moderated the relationship between self-manager agreement and performance change. Specifically, culture profile moderated the relationship between agreement and self ratings on Collaborating, Making Sound Decisions, and Taking Strategic Risks when comparing those profiles.

Culture profile also moderated the relationship between self-other agreement and performance change when comparing Profile 3 with Profiles 5 and 7. When analyzing Profiles 3 and 5 together, culture profile moderated the relationship between self-manager agreement and self ratings on Collaborating, Taking Strategic Risks, and Demonstrating Trustworthiness. Further, comparison of Profiles 3 and 7 found that culture profile moderated the relationship between self-manager agreement and self ratings on Partnering with Clients, Collaborating, Making Sound Decisions, and Demonstrating Trustworthiness.

When Profile 4 was compared to Profile 5, culture profile was found to moderate the relationship between self and subordinate agreement and self ratings on Demonstrating

Trustworthiness, Enabling Performance, and Demonstrating Passion for the Business. Additionally, culture moderated the relationship between self and subordinate agreement and subordinate ratings on Collaborating, Thinking Broadly, Taking Strategic Risks, and Demonstrating Trustworthiness. Taken collectively, these findings provide some evidence for the role of culture as a moderator in the relationship between self-other agreement and performance change.

Table 15.

R^2 Change from Regression Test of the Relationship between Self-Other Agreement and Gain Scores Moderated by Culture Profile (Profile 1)

Gain Score		Self										Other									
Competency dimension		PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB	PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB
Profile 1 and:																					
Self-Manager	2	-	.45**	.27*	-	-	.29***	-	-	-	-	-	-	-	.15**	-	.26*	-	-	-	-
	3	.54**	.46*	.37**	-	.50**	.21*	.68**	-	.44*	.51*	-	-	-	.15*	-	-	-	-	-	-
	4	.36**	.26*	-	-	-	-	-	-	-	-	-	-	-	.14**	-	-	-	.256*	-	-
	5	-	-	-	-	-	.27**	-	-	.23*	-	-	-	-	-	.21*	.25*	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	.20***	-	-	-	.29*	-	-
	7	-	-	-	-	.28*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Self-Colleague	2	-	-	-	-	-	-	-	-	-	-	.25*	-	-	.17*	.35***	-	-	-	-	-
	3	-	-	-	-	-	-	.57***	-	-	-	-	-	-	-	-	-	-	-	-	.15*
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.11*
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	.29*	-	-	-	-	-	-	-	-	-
Self-Subordinate	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.201**	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	.22*	-	-	-	-	-	-	.32*	-
	4	-	-	-	-	.14*	-	-	-	-	-	-	.22*	-	-	-	-	.16**	-	-	-
	5	-	-	-	-	-	-	-	-	-	.20*	-	.40***	.29**	.39***	.36**	.25**	.33***	.27*	.34**	.18***
	6	-	-	-	-	-	-	-	-	-	-	-	.15*	-	-	-	-	-	-	-	-
	7	-	-	-	.404*	-	-	-	-	-	-	-	-	-	-	-	-	.11*	-	-	-

Note: For clarity, only R^2 changes with significant F changes are presented.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 16.

R^2 Change from Regression Test of the Relationship between Self-Other Agreement and Gain Scores Moderated by Culture Profile (Profile 2)

Gain Score		Self										Other									
Competency dimension		PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB	PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB
Profile 2 and:																					
Self-Manager	1	-	.45**	.27*	-	-	.29†††	-	-	-	-	-	-	-	.15**	-	.26*	-	-	-	-
	3	-	.57*	-	-	.64*	.28*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	.28*	-	-	-	-	-	-	-	-	-	-	-	.18*	-	-	-	.52**	-	-
	5	-	-	-	-	-	.17**	-	.38**	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	.18*	-	-	.15*	-	-	-	-	-	-
	7	-	-	-	-	-	.28*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Self-Colleague	1	-	-	-	-	-	-	-	-	-	-	.25*	-	-	.17*	.35†††	-	-	-	-	-
	3	-	-	-	-	-	-	.45*	-	-	-	-	-	-	.29**	-	-	-	-	.12*	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.42†††	-	.45**	-	-	-
	5	-	-	-	-	-	-	.24*	-	-	-	-	-	-	-	.23*	-	-	.39**	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.20*	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.20*	-	-	-	-	-
Self-Subordinate	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.20††	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.26**	-	-	-
	5	-	-	-	-	-	-	-	.40**	-	-	-	-	-	.30**	-	-	.23*	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	.14*	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-

Note: For clarity, only R^2 changes with significant *F* changes are presented.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 17.

R^2 Change from Regression Test of the Relationship between Self-Other Agreement and Gain Scores Moderated by Culture Profile (Profile 3)

Gain Score		Self										Other									
Competency dimension		PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB	PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB
Profile 3 and:																					
Self-Manager	1	.54**	.46*	.37**	-	.50**	.21*	.68**	-	.44*	.51*	-	-	-	.15*	-	-	-	-	-	-
	2	-	.57*	-	-	.64*	.28*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	.62**	-	-	-	-	.68*	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	.57*	-	-	-	.37*	.58***	-	-	.379**	-	-	.55*	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	.314*	-	.42***	-	-	-	-	-	-	-	-	-
	7	.42**	.41**	-	-	.34*	-	.38**	-	-	-	-	-	-	-	-	-	-	-	-	-
Self-Colleague	1	-	-	-	-	-	-	.57†††	-	-	-	-	-	-	-	-	-	-	-	-	.15*
	2	-	-	-	-	-	-	.45*	-	-	-	-	-	-	.29**	-	-	-	-	.12*	-
	4	-	-	-	-	-	-	.48**	-	-	-	-	-	-	-	-	-	.33*		-	-
	5	-	-	-	-	-	-	.57**	-	-	.26*	-	-	-	-	-	-	-	.25*	-	-
	6	-	-	-	-	-	-	.32**	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	.50**	-	-	-	-	-	-	-	-	-
Self-Subordinate	1	-	-	-	-	-	-	-	-	-	-	-	.22*	-	-	-	-	-	-	.32*	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	.20*	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	.28*	-	.34**	-	.37**	-	.26*	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: For clarity, only R^2 changes with significant *F* changes are presented.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 18.

R^2 Change from Regression Test of the Relationship between Self-Other Agreement and Gain Scores Moderated by Culture Profile (Profile 4)

Gain Score		Self										Other									
Competency dimension		PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB	PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB
Profile 4 and:																					
Self-Manager	1	.36**	.26*	-	-	-	-	-	-	-	-	-	-	-	.14**	-	-	-	.26*	-	-
	2	-	.28*	-	-	-	-	-	-	-	-	-	-	-	.18*	-	-	-	.52**	-	-
	3	-	.62**	-	-	-	-	.68*	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	.25*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.42*	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.34**	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	.26*	-	-	-	.49**	-	-
Self-Colleague	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.11*
	2	-	-	-	-	-	-	.24*	-	-	-	-	-	-	-	.23*	-		.39**	-	-
	3	-	.23*	-	-	-	-	.48**	-	-	-	-	-	-	-	-	-	.33*	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.38**	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Self-Subordinate	1	-	-	-	-	.14*	-	-	-	-	-	-	.22*	-	-	-	-	.16**	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.26**	-	-	-
	3	-	-	-	-	-	-	-	-	-	.20*	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	.16*	.20*	-	.10*	-	.38*	-	.38**	-	.18*	.44*	-	-	-
	6	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	.17*	-	-	-
	7	-	-	-	-	-	-	-	-	-	.21*	-	-	.16*	-	-	-	-	-	-	-

Note: For clarity, only R^2 changes with significant F changes are presented.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 19.

R^2 Change from Regression Test of the Relationship between Self-Other Agreement and Gain Scores Moderated by Culture Profile (Profile 5)

Gain Score		Self										Other									
Competency dimension		PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB	PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB
Profile 5 and:																					
Self-Manager	1	-	-	-	-	-	.27**	-	-	.23*	-	-	-	-	-	.21*	.25*	-	-	-	-
	2	-	-	-	-	-	.17**	-	.38**	-		-	-	-	-	-	-	-	-	-	-
	3	-	.57*	-	-	-	.37*	.58***	-	-	.38**	-	-	.55*	-	-	-	-	-	-	-
	4	-	.25*	-	-	-	-	-	-	-		-	-	-	-	-	-	-	.42*	-	-
	6	-	-	-	-	-	-	-	-	.22*	.23**	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
Self-Colleague	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	.57**	-	-	.26*	-	-	-	-	-	-	-	.25*	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.38**	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.28**	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.49***	-	-
Self-Subordinate	1	-	-	-	-	-	-	-	-	-	.20*	-	.40†††	.29**	.95†††	.36**	.25**	.33†††	.27*	.34††	.18***
	2	-	-	-	-	-	-	-	.40**	-	-	-	-	-	.30**	-	-	.23*	-	-	-
	3	-	-	-	-	-	-	-	.28*	-	.34**	-	.37**	-	.26*	-	-	-	-	-	-
	4	-	-	-	-	-	-	.16*	.20*	-	.10*	-	.38*	-	.38**	-	.18*	.44*	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	.23**	-	-	-	-	-	-	-	-
	7	-	-	-	.49*	-	-	.20*	-	-	-	-	.28*	-	-	-	-	.32*	-	-	-

Note: For clarity, only R^2 changes with significant F changes are presented.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 20.

R^2 Change from Regression Test of the Relationship between Self-Other Agreement and Gain Scores Moderated by Culture Profile (Profile 6)

Gain Score		Self										Other									
Competency dimension		PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB	PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB
Profile 6 and:																					
Self-Manager	1	-	-	-	-	-	-	-	-	-	-	-	-	-	.20***	-	-	-	.29*	-	-
	2	-	-	-	-	-	-	-	-	-	-	.18*	-	-	.15*	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	.31*	-	.42***	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.34**	-	-
	5	-	-	-	-	-	-	-	-	.22*	.23**	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	.29**	-	-	-	-	-	-	-	-	-
Self-Colleague	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.20*	-	-	-	-	-
	3	-	-	-	-	-	-	.32**	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.28**	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Self-Subordinate	1	-	-	-	-	-	-	-	-	-	-	-	.15*	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	.14*	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17*	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	.23**	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	.28*	-	-	-	-	-	-	-	-	-	-

Note: For clarity, only R^2 changes with significant F changes are presented.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 21.

R^2 Change from Regression Test of the Relationship between Self-Other Agreement and Gain Scores Moderated by Culture Profile (Profile 7)

Gain Score		Self										Other									
Competency dimension		PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB	PC	C	MCC	TB	MSD	TSR	DT	EP	DO	DPB
Profile 7 and:																					
Self-Manager	1	-	-	-	-	.28*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	.28*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	.42**	.41**	-	-	.34*	-	.38**	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	.26*	-	-	-	.49**	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	.29**	-	-	-	-	-	-	-	-	-
Self-Colleague	1	-	-	-	-	-	-	-	-	-	-	.291*	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.20*	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	.50**	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.49***	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Self-Subordinate	1	-	-	-	.404*	-	-	-	-	-	-	-	-	-	-	-	-	.11*	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	.31*	-	-	-	-	-	.21*	-	-	.16*	-	-	-	-	-	-	-
	5	-	-	-	.49*	-	-	.20*	-	-	-	-	.28*	-	-	-	-	.32*	-	-	-
	6	-	-	-	-	-	-	-	-	-	.28*	-	-	-	-	-	-	-	-	-	-

Note: For clarity, only R^2 changes with significant F changes are presented.
*$p < .05$. **$p < .01$. ***$p < .001$.

Discussion

The overall purpose of this study was to increase our understanding of the impact of multi-source feedback on performance in a culturally diverse sample of developing technical leaders. First, this study examined the change in leader performance after receiving multi-source feedback by comparing leadership competency dimension ratings from two points in time. Second, the relationship between self-other rating agreement and performance change was studied using polynomial regressions and response surface methodology. Finally, this study examined the impact of culture on these relationships. To accomplish this, individualism/collectivism, power distance, uncertainty avoidance, and masculinity/femininity cultural values were studied separately as dimensions and combined as culture profiles.

Similar to the earlier meta-analysis by Kluger and DeNisi (1996) which found that performance increased after feedback in only 80% of the studies they reviewed, results of the current study were mixed. Rating differences between time 1 and time 2 were not significant across all rating sources and all leadership competency dimensions. Managers and subordinates had the least number of significant gain scores, with two each. By contrast, colleague gain scores were significant on nine of the ten competency dimensions. This may suggest that the different rating sources have different perspectives, perhaps based on the varied contexts in which they observe the participants. Managers in global, matrixed organizations may not be familiar with the day to day performance or behaviors of the participants. Subordinates may not have the opportunity to observe the full responsibilities

and strategic contributions of the technical leader. Further, technical leaders often provide technical direction and guidance or serve as subject matter experts, but may not actually manage others. This may also limit the scope of behaviors observed by subordinates. As peers, colleagues may be in the best position to notice changes in behaviors after multi-source feedback because they may see the leader in the widest variety of situations.

The relationship between self-other agreement and gain score exhibited different patterns based on rating source. One common relationship observed between self-other agreement and self ratings was the tendency for under-raters at time 1 to show the largest gain in self ratings. This pattern was not observed in ratings by others. This trend could suggest that multi-source feedback increased under-raters' self-awareness, resulting in self ratings at time 2 which were more aligned to others.

The opposite pattern was observed between self-other agreement and other ratings, where high gain scores were related to over-rating at time 1. Those participants who over-rated themselves at time 1 were seen by others as having the biggest performance improvement on a number of dimensions. This could indicate that under-raters made more of an effort to demonstrate effective leader behaviors following feedback.

Another relationship observed was between lower ratings by others at time 1 and gain score. Regardless of self-other agreement, participants who received low ratings from others at time 1 tended to have the largest gain scores. This pattern occurred most frequently between self-manager agreement and manager ratings, appearing in six of the ten competency dimensions. For colleague gain scores, three dimensions displayed this

relationship. Only one dimension for subordinates showed this relationship. This may suggest that the source of low ratings may differentially impact the relationship between self-other agreement and performance change.

While similar patterns were seen across the graphs of self-other ratings and manager, colleague, and subordinate gain scores, different patterns were seen within individual competencies for each of the other rating sources. Enabling Performance was the only competency dimension to have similar response surfaces for manager, colleague and subordinate gain scores. This suggests that the relationship between self-other agreement and performance changes varies across rating sources and competency dimensions. Future research could study the relationship between different rating sources, agreement, and different types of leadership behaviors to better understand the underlying dynamics.

In addition to testing the relationships previously found between multi-source feedback, self-other agreement and performance change on a global sample, this study also examined whether or not the addition of culture as either a dimension or as a profile was related to performance change. Due to the number of analyses conducted on the relationships between culture dimensions and performance change, a number of isolated significant findings may be attributed to Type I errors. As such, it may be useful to focus on themes that emerged rather than individual analyses.

First, the findings suggest that performance increase was positively related to uncertainty avoidance for all subordinate gain scores with the exception of one competency dimension. It was negatively related to manager gain scores on three competencies. The

negative relationship may be due to the complexity of leadership behaviors, where practice and experience are required to build capabilities. Participants high in uncertainty avoidance prefer structure and direction and may not be comfortable experimenting with new behaviors as opportunities arise. Without clear guidance on how to behave, they may revert to habits and past behaviors. As such, these participants would benefit from opportunities to practice new behaviors in a safe environment and from additional coaching and on-going support. Contrary to that, participants low in uncertainty avoidance may be more comfortable practicing new behaviors once they are back at work. They may also be more comfortable with the ambiguity of demonstrating effective leadership in changing contexts.

Second, a non-linear relationship was observed between masculinity/femininity values and performance change as perceived by managers. This means that managers observed more performance improvement as masculinity/femininity values increased but only to a certain point. After that point, observed performance change decreased as masculinity/femininity values continued to increase. This suggests that masculinity/femininity values influence how participants behave. Participants with low masculinity/femininity values may tend to be modest. They may be less likely to display leadership behaviors or to "manage upward" to make their managers aware of their leadership behaviors and accomplishments. Participants with higher masculinity/femininity values may be more assertive and competitive. Their behaviors may be viewed as more self-promoting than leader-like, so managers may not observe changes in behavior as positively. Given that this relationship was only significant with manager gain scores, suggests this

dimension may influence the extent to which participants behave differently in front of their managers.

As part of the leadership program, participants were encouraged to review their survey results with their managers. It is possible that participants in the mid-range of the masculinity/femininity dimension were more likely to follow through on this action. Managers who reviewed the survey feedback of one of their subordinates could be more aware or more sensitive to changes in the subordinate's behavior. No trends were found for the individualism/collectivism or power distance dimensions for any rating source in this sample.

Across a number of leadership dimensions, culture dimensions were found to moderate the relationship between self-other agreement and performance change. Individualism/collectivism did not moderate the relationship between agreement and other gain scores on any leadership dimension for managers, colleagues or subordinates. While power distance moderated the relationship between self-other agreement and self gain scores on a number of dimensions, it only moderated self-manager agreement and manager ratings on two dimensions. Uncertainty avoidance was found to be a moderator for self-other agreement and both manager and subordinate ratings on two and five dimensions respectively. Masculinity- femininity was found to moderate the relationship between self-other agreement and self ratings on three dimensions, and manager ratings on one dimension. This suggests that the relationship between culture dimensions and performance change

differs across culture dimension and rating sources. Future research to further explore the underlying dynamics of these relationships would broaden our understanding in this area.

Cluster analysis identified seven culture profiles that were distinct from each other on a linear combination of the four cultural dimensions. Aside from manager gain scores on a few competency dimensions, culture profiles did not significantly differ on performance change. While Profiles 1, 3, and 5 were also found to significantly differ when culture was used as a moderator, the small sample size precludes drawing conclusions that can be generalized beyond the current study. One possible avenue of future research could be to create a taxonomy of culture profiles that generalizes beyond a specific sample or organization and study the effectiveness of multi-source feedback in leadership development across the different profiles.

Limitations

The primary limitation to this study was the small sample size, particularly when conducting the culture profile analyses. A larger sample size, and the resulting increased number of participants per profile, would have made the analysis more robust. This is especially true given the number of leadership competency dimensions, profiles, and thus calculations that were conducted as part of this study.

Another limitation was the fact that all participants came from the same organization. The Attraction-Selection-Attrition framework proposed by Schneider (1987) suggests that organizations are defined by the collective characteristics of its members. A study by De Cooman et al. (2009) applied the framework to work values and found that attrition was

higher for employees who perceived a lower match between their values and those of the organization. They also found that work values changed slightly after employees were socialized to the organization to become more similar to those of the organization. Applying this to the current study would suggest that employees of a single organization may have similar values.

In addition to similar values, participants also share a common organizational culture. This shared culture may minimize or partially mask the relevance of cultural values in the work environment. A sample from different organizations and even different industries would be more representative of the global workforce.

Future Research

In addition to the areas of future research discussed above, several other possibilities are worth mentioning. The current study found mixed support for the influence of culture on the relationship between multi-source feedback and performance change. Future research could explore this relationship further by examining other culture models, such as the dimensions used in the GLOBE study.

Future research could also explore the impact of culture on other aspects of the feedback process. Examples of this include culture differences in reactions to feedback, commitment to development plans, and management support. These characteristics may explain differences observed in performance change after feedback.

Finally, future research could expand the scope of the study in several ways. The study could be expanded to include participants from both technical and non-technical

backgrounds. Additionally, the scope could be expanded to examine the impact of cultural values on performance change beyond the development context. Rather than focusing on general leadership behaviors, leader performance could be measured using business outcomes or other job related performance measures.

This study should be viewed as a first step in exploring the impact of culture values on the relationship between feedback and performance change. The preliminary evidence found here will hopefully encourage future research in this area. In an increasingly global workforce, additional research would greatly add to our understanding of how best to use feedback to develop leaders.

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APPENDICIES

Appendix A

Leadership Development Survey, Sample Items.

Dimension	Item
Partnering with Clients	Can translate stated business needs into the appropriate technological solution, clearly communicating that solution to the client and setting reasonable expectations of what can and cannot be accomplished.
Collaborating	Builds teams to which people want to belong.
Managing Challenge and Complexity	Identifies and distills the central issues in difficult problems, selecting and focusing on the most important elements.
Thinking Broadly	Sees opportunities to add sustainable value to a client, technology, or market by integrating multiple capabilities within [the organization].
Making Sound Decisions	Gathers and validates information from different sources.
Taking Strategic Risks	Knows when a project is no longer viable, and can define and manage mitigation strategies, based on objective technical assessment.
Demonstrating Trustworthiness	Invests in relationships by putting the interests of others ahead of own personal agenda.
Enabling Performance	Sets performance expectations clearly and ensures that others understand the importance of the goal.
Developing Others	Provides developmental feedback and advice.
Demonstrating Passion for the Business	Inspires confidence in the broader technical community that [the organization] leads the industry in innovation and technological advances.

Appendix B

Summary of data sources and sample sizes used in the study

			Archival Data								Study Data
			Time 1 ratings only				Time 1 and Time 2 ratings				
	Variables	Data included in analysis: Number of participants in analysis*:	Self	Manager	Colleague	Subordinate	Self	Manager	Colleague	Subordinate	Culture Value Survey
Hypothesis 1	Self ratings (T1, T2)	194-202					x				
	Manager ratings (T1, T2)	145-148						x			
	Colleague ratings (T1, T2)	214-215							x		
	Subordinate ratings (T1, T2)	166								x	
Hypothesis 2	Self/Manager agreement (T1) Self gain score (T1, T2)	114-119		x			x				
	Self/Manager agreement (T1) Manager gain score (T1, T2)	116-119	x					x			
	Self/Colleague agreement (T1) Self gain score (T1, T2)	164-172			x		x				
	Self/Colleague agreement (T1) Colleague gain score (T1, T2)	170-172	x						x		
	Self/Subordinate ratings at T1 Self gain scores (T1, T2)	130-134				x	x				
	Self/Subordinate agreement (T1) Subordinate gain scores (T1, T2)	134	x							x	

**Separate analyses were conducted for each leadership dimension; some participants were missing data on one or more competencies. The range presented here shows the smallest and largest sample sizes analyzed across the dimensions.*

Summary of data sources and sample sizes used in the study (Continued)

			Archival Data								Study Data
			Time 1 ratings only				Time 1 and Time 2 ratings				
	Variables	Data included in analysis: Number of participants in analysis*:	Self	Manager	Colleague	Subordi-nate	Self	Manager	Colleague	Subord inate	Culture Value Survey
Research Question 1	Culture profile creation	334									x
	Self gain score (T1, T2) Culture profile	127-133					x				x
	Manager gain score (T1, T2) Culture profile	83						x			x
	Colleague gain score (T1, T2) Culture profile	117							x		x
Hypothesis 3	Subordinate gain score (T1, T2) Culture profile	95								x	x
	Self gain score (T1, T2) Culture dimensions	127-133					x				x
	Manager gain score (T1, T2) Culture dimensions	83						x			x
	Colleague gain score (T1, T2) Culture dimensions	117							x		x
	Subordinate gain score (T1, T2) Culture dimensions	95								x	x

**Separate analyses were conducted for each leadership dimension; some participants were missing data on one or more competencies. The range presented here shows the smallest and largest sample sizes analyzed across the dimensions.*

Summary of data sources and sample sizes used in the study (Continued)

			Archival Data								Study Data
			Time 1 ratings only				Time 1 and Time 2 ratings				
	Variables	Data included in analysis: Number of participants in analysis*:	Self	Manager	Colleague	Subordinate	Self	Manager	Colleague	Subordinate	Culture Value Survey
Research Question 2	Self/Manager agreement (T1) Self gain score (T1, T2) Culture dimensions	79-83		x			x				x
	Self/Manager agreement (T1) Self gain score (T1, T2) Culture profile	4-21		x			x				x
	Self/Manager agreement (T1) Manager gain score (T1, T2) Culture dimensions	81-83	x					x			x
	Self/Manager agreement (T1) Manager gain score (T1, T2) Culture profile	4-21	x					x			x
	Self/Colleague agreement (T1) Self gain score (T1, T2) Culture dimensions	111-117			x		x				x
	Self/Colleague agreement (T1) Self gain score (T1, T2) Culture profile	8-27			x		x				x
	Self/Colleague agreement (T1) Colleague gain score (T1, T2) Culture dimensions	116-117	x						x		x
	Self/Colleague agreement (T1) Colleague gain score (T1, T2) Culture profile	8-27	x						x		x
	Self/Subordinate agreement (T1) Self gain score (T1, T2) Culture dimensions	92-95				x	x				x
	Self/Subordinate agreement (T1) Subordinate gain score (T1, T2) Culture profile	4-22	x							x	x

**Separate analyses were conducted for each leadership dimension; some participants were missing data on one or more competencies. The range presented here shows the smallest and largest sample sizes analyzed across the dimensions*