

**CONSTRUCT CONFUSION AND ASSESSMENT CENTERS:
A PERSON-SITUATION INTERACTIONIST PERSPECTIVE**

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ABSTRACT

Despite the evidence that assessment centers (ACs) are effective predictors of career advancement and job performance, considerable confusion remains regarding *why* this is the case. Traditional AC theory and practice suggest it is because the skill dimensions typically evaluated in ACs (e.g. such as critical thinking, organizing and planning, and stress tolerance) represent stable traits that can be assessed across various exercises (Sackett & Dreher, 1982). However, reviews of the empirical findings accumulated over the last 25 years show that correlations between *different* dimensions *within* exercises are larger than correlations of the *same* dimensions *across* exercises (Lance et al., 2004b). That is, participants tend to score higher on dimensions in one exercise but lower on all these dimensions in another exercise. Person-situation interactionist models suggest that these findings may be due to the interaction of individual differences and exercise characteristics (Lance et al, 2000; Schneider, 1983). Based on these models, exercise form (i.e. group interaction vs. individual presentation) and the competitive nature of the exercise were hypothesized to moderate the relationships between participants' individual difference variables (i.e. communication apprehension and collectivistic values) and their dimension scores.

282 students participated in oral presentation and group discussion exercises in an assessment center and were scored on their performance by trained raters on oral communication and critical thinking dimensions. Regression results indicated that participants' scores on critical thinking did vary across exercises depending on their communication apprehension. This demonstrates that performance is likely to vary across exercises depending on salient exercise characteristics and individual characteristics of

the participants and can help explain the lack of construct validity reported in the assessment center literature (Lievens, Chasteen, Day, Christiansen, 2006). In addition, structural equation modeling results demonstrated that communication apprehension completely mediated the relationships between individuals' extraversion and emotional stability and their dimension scores. These data give insight into why extraversion and emotional stability have consistently been related to AC performance. The findings have implications for how developmental feedback is given to participants, how exercises are designed and selected, and how the communication requirements of exercises may influence participants' performance in ACs.

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CHAPTER 1: INTRODUCTION

An assessment center (AC) is a measurement process consisting of standardized observations of behavior in simulated organizational settings. Multiple assessors observe behavior in multiple types or forms of exercises (e.g. in-basket, role-play, leaderless group discussion, oral presentation) that simulate tasks that participants (or assesseees) may face in future organizational roles (International Task Force on Assessment Center Guidelines, 2000). Assessors rate participants on a set of key person-centered competencies or dimensions (Thornton & Mueller-Hanson, 2004).

Dimensions refer to a cluster of behaviors that are specific, observable, and can be reliably classified within the context of a competency profile (Thornton & Byham, 1982). Examples of common AC dimensions are oral communication skill, decision-making abilities, leadership, and willingness to take initiative (Arthur, Day, McNelly, & Edens, 2003). AC simulation exercises allow for the assessment of interpersonal dimensions that are difficult to assess without observing complex, overt behavior (Thornton & Mueller-Hanson, 2004).

The most common purposes of assessment centers are selection and promotion decision-making, early identification of management potential, and training and development (Gaugler, Rosenthal, Thornton, & Benston, 1987). The first use of the AC method is credited to German military psychologists in the early 1940's, and was quickly adapted for selecting officers by the American Office of Strategic Services. The first industrial use was in 1956 by AT&T, in what is known as the Management Progress Study (Bray, Campbell, & Grant, 1974).

The objective of the Management Progress Study was to predict and explain the career progress of young men pursuing managerial careers. When criterion data were gathered approximately 8 years after the initial assessment center, the data showed that of the 103 subjects predicted to advance to middle management based on the assessment center, 42 percent had actually done so. Of the 166 who were judged not to have the qualities for middle management or about whom there was some question, only 7 percent had advanced to those levels of middle management (Thornton & Byham, 1982). This validation of the Management Progress Study was impressive considering that no information about any of the candidates' performance in the AC was ever communicated to AT&T officials and the researchers waited eight years before gathering information on assessees' progress.

Since those early uses, the AC has become a popular technique for assessing both managerial and non-managerial candidates in public and private organizations, including the governmental, educational, consulting, manufacturing, and service sectors (Gaugler et al., 1987, Spsychalski, Quinones, Gaugler, & Pohley, 1997). More recently, meta-analyses of AC results have confirmed early findings on the criterion-related validity of ACs (Hunter & Hunter, 1984; Gaugler et al. 1987). Gaugler et al. (1987) examined 107 validity coefficients and found a corrected mean validity of .37. Although the authors state that there may have been problems with the methodological quality of some of the reviewed studies, the overall evidence clearly suggests that assessment center ratings do predict subsequent career advancement and job performance.

Despite the evidence that ACs used for selection and promotion purposes exhibit criterion-related validity, there remains considerable confusion regarding *why* AC ratings

covary with criterion variables (Klimoski & Brickner, 1987; Spector, Schneider, Vance, & Hezlett, 2000). Establishing the construct validity of AC dimensions has intrigued researchers for decades. Russell and Domm (1995) stated “simply put, assessment centre ratings must be valid representations of some construct(s), we just do not know which one(s).”

One trend is that ACs are increasingly being used for developmental purposes (Spychalski et al., 1997; Lievens & Klimoski, 2001) to identify participants’ training needs and/or to formulate personalized action plans (Kudisch, Ladd, & Dobbins, 1997). Although a clear understanding of what is being assessed in ACs may not be a practical necessity for ACs to be used for selection or promotional purposes, it becomes critical if one of the purposes of the AC is to give developmental feedback to participants. In order to give accurate and helpful feedback it is imperative to understand what has contributed to the participant’s behavior and whether the dimensions are accurate representations of this behavior (Carrick & Williams, 1999).

Purpose of the Research

This study was designed to gain a better understanding of the construct validity of dimension ratings in ACs. By systematically considering and varying exercise form and content, I seek to provide insight into how these underlying exercise characteristics may influence participant behavior. Based on a person-situation interaction model, I examine how certain individual characteristics may contribute to dimension ratings within and across AC exercises (Tett & Burnett, 2003). By examining the interactions of person-centered attributes and exercise form and content on participant behavior, we can better

understand what the dimension scores actually represent and why dimension ratings are not stable across exercises.

In addition, as a secondary purpose of this study, I explore the role of communication apprehension as a mediator of the relationships between two Big Five personality variables (extraversion and emotional stability) and the dimension scores. A significant amount of research relating both extraversion and emotional stability to assessment center performance exists, so the goal is to demonstrate how communication apprehension may relate to these previous research findings. This can also empirically demonstrate how the communication requirements of AC exercises may influence assessee performance.

CHAPTER 2: LITERATURE REVIEW AND HYPOTHESES

AC Construct Validity

Internal and external construct validation strategies have been used to examine whether assessor ratings of dimensions are valid indicators of individual abilities or characteristics (Lievens & Klimoski, 2001). Traditional AC theory and practice suggest that the dimensions assessed in ACs represent stable traits that can be assessed across various exercises. (Byham, 1978; Lance, Lambert, Gewin, Lievens, & Conway, 2004b). Below is a brief review of how previous research has explored the construct validity of ACs followed by an introduction to the exercises and dimensions used in this study. The hypotheses to be tested in this study are then presented.

Internal Validation Strategy. In most assessment centers, assessors usually give dimension ratings for each exercise (Woehr and Arthur, 2003). The internal validation strategy has specifically looked at the convergent and discriminant relationships of these AC dimension ratings (i.e. mono- and hetero- trait and method correlations). Support for the construct validity of AC dimensions would be found if correlations between dimensions across exercises (convergent validity) were higher than correlations between different dimensions (discriminant validity) within exercises. However, several reviews of the empirical findings accumulated over the last 20 years show that correlations between ratings of different dimensions within the same exercise tend to be much larger than the correlations between ratings of the same dimensions across different exercises, which does not support traditional AC theory (Sackett & Dreher, 1982; Lance et al., 2004b; Woehr & Arthur, 2003; Sackett & Tuzinski, 2001).

Findings that dimension scores lack convergent validity has been quite consistent despite many studies introducing various AC design modifications (including those targeting rater accuracy) intended to increase the correlations between dimensions across exercises (Lance, Foster, Gentry, & Thoresen, 2004a). Instead, as alluded to earlier, assessee performance tends to be relatively undifferentiated (i.e. generally good or poor) across dimensions for each exercise and cross-situationally specific, as each exercise defines the different performance situations (Lance et al., 2004b).

More broadly, these findings are consistent with the person-situation interactionist perspective of cross-situational specificity of behavior (Schneider, 1983; Tett & Burnett, 2003) and the notion that performance requirements change across different AC exercises (Russell, 1987; Lance et al., 2000). This perspective points to an increased importance of AC exercise design and calls for a closer examination of how the exercises influence participant behavior.

Following this perspective, a few studies (e.g. Bycio, Alvares, & Hahn, 1987; Schneider and Schmitt, 1992) have sought to understand what design characteristics of AC exercise situations may be most salient to participants. Schneider and Schmitt (1992) propose exercise form and content as two exercise-based factors. Exercise form refers to the type of exercise (e.g. oral presentation, in-basket, group discussion) used in the AC, while exercise content refers to the nature or design of the tasks performed within a particular type of exercise.

Schneider and Schmitt (1992) suggested that the comparison across different forms of exercises may partly explain the low correlations across exercises. However, Bycio et al. (1987) and Sackett and Harris (1988) still found method factors when

looking at correlations across the same type of exercise (i.e. leaderless group discussion). For these reasons, Schneider and Schmitt (1992) point out that exercise form is not likely to be the sole explanation for the exercise effect and suggest that exercise content is also likely to be important. Therefore, both the form of the exercise and the content or nature of the exercise are believed to be important underlying exercise design characteristics that define the situational stimuli in ACs.

Some of these underlying exercise characteristics include whether participants are observed as individuals or as part of a group, the interpersonal interaction and oral communication requirements of the exercise (Bycio et al., 1987), the cognitive complexity of the exercise (Lance et al., 2000; Goldstein, Yusko, Braverman, Smith, & Chung, 1998), and competitive nature of the exercise (Schneider & Schmitt, 1992). These are characteristics that can vary within and across AC exercises depending on the form and content of the exercise. These are the kinds of underlying situational characteristics that would be expected to influence participants in different ways, depending on the participants' individual characteristics.

Lievens (2002a) suggests that “future studies are needed to examine under which conditions candidates in operational centers adjust their behavior from one exercise to another.” He believes the answer to this question is likely to be complex, as trait-related and individual difference variables, as well as situational variables (exercise characteristics) may lead participants to perform differently across exercises. Lievens (2002a) concludes that future research is needed to ascertain which of these variables are most responsible for the lack of convergent validity of dimension ratings. In line with this recommendation, the primary purpose of this research is to explore person-situation

interaction effects to better understand participant performance across different assessment center exercises.

<< Insert Figure 1 about here >>

External Validation Strategy. Figure 1 is representative of the AC process. Based on an interactionist perspective, participant behavior in the AC exercises could be considered to be a function of person-centered characteristics, exercise characteristics, and person-exercise interaction characteristics (Schneider, 1983; Tett & Burnett, 2003). Participant behaviors are observed by assessors and used to estimate dimension and exercise scores. In most ACs, these dimension and/or exercise scores are then integrated to give an overall assessment rating (OAR). As highlighted in Figure 1, the current research will focus on how person-exercise interaction characteristics and exercise characteristics influence participants' behavior and their dimension scores.

Studies using the external validation strategy have examined correlations between independent person-centered characteristics (primarily personality and cognitive ability measures) and overall dimension scores, overall exercise scores, and/or the overall assessment rating (OAR) from the AC. Two meta-analyses (Collins et al., 2003; Hoefft & Schuler, 2001) have summarized the empirical results related to relationships between individual trait measures (e.g. personality and cognitive ability) and OARs from the AC. These reviews utilize the Big Five personality framework, which many researchers have converged on as a common taxonomic structure for personality over the past 15 years (Barrick and Mount, 1991). Based on between 5-13 studies, Collins et al. (2003) found

uncorrected mean effect sizes of .12, .18, .26, and .36 between the overall assessment rating and the four Big Five dimensions agreeableness, openness, emotional stability and extraversion, respectively. In addition, they reported a sample size weighted mean effect size of .43 between cognitive ability and the overall assessment center rating.

However, even if consistent relationships between person-centered characteristics and the OAR are found, these correlations reveal little about the “black box” of what happened in the AC exercises or what might have contributed to different dimension scores. A few studies have examined the relationship between individual characteristics and overall dimension or exercise scores. Evidence that dimension ratings produce patterns of convergent and discriminant validity with independent measures related to the dimensions would offer some support for the construct validity of AC dimensions, although it would not necessarily explain the lack of convergent validity in ACs.

A few studies have used this nomological network approach (Cronbach & Meehl, 1955) and have produced some significant correlations between these external measures with conceptually similar AC dimensions (e.g. Shore, Thorton, & Shore, 1990; Thorton, Tziner, Dahan, Clevenger, & Meir, 1997). For example, Shore et al., 1990 found that cognitive ability correlated more strongly with problem-solving, performance-style dimensions while personality traits correlated more strongly with interpersonal style dimensions. Others researchers have generally failed to produce such relationships (e.g. Crawley, Pinder, & Herriot, 1990; Chan, 1996, Fleenor, 1996; Goffin, Rothstein, & Johnson, 1996).

These mixed results prompted Lievens (2002b) to conclude that these studies show a somewhat equivocal picture and to recommend that an interesting avenue for

future research may be to relate ratings on personality characteristics to dimension ratings in separate AC exercises. He believes that this may overcome possible limitations of the broader final dimension ratings and OARs, which may have contributed to the ambiguous results in previous research.

The present study follows an external validation strategy by exploring the relationships of dimension scores with external measures of person-centered characteristics and exercise characteristics. This study will use a developmental AC context in which these dimension scores will be the criterion variables of interest (Craik et al., 2002). Rather than seeking to explore a broad range of individual characteristic variables, it includes extraversion and emotional stability, two of the Big Five personality variables that have demonstrated the highest correlations with AC performance measures in previous research. In addition, it focuses on communication apprehension and the cultural value of individualism-collectivism, two previously unexplored individual characteristic variables within in the AC context.

These variables are believed to be relevant to at least two forms of AC exercises: group interaction exercises (i.e. leaderless group discussions) and individual presentation exercises (i.e. oral presentations). In addition, this study follows Schneider and Schmitt (1992) by manipulating the competitive content within each of these two exercise forms. Johnson, Maruyama, Johnson, Nelson, and Skon (1981, p. 47) state that, “A competitive social situation is one in which the goals of the separate participants are so linked that there is a negative correlation among their goal attainments.” As can be seen in Table 1, the effects of the competitive and non-competitive nature of the exercise are explored within both the group interaction and individual presentation exercises.

<< Insert Table 1 about here >>

Assessment Center Exercises

The present study will focus on two commonly used AC exercises: the leaderless group discussion (LGD) and the oral presentation (Spsychalski et al, 1997). A brief review of the literature related to these exercises is outlined below followed by the pertinent dimensions that will be assessed within these exercises.

Leaderless Group Discussion (LGD). In a leaderless group discussion (or LGD), participants usually work in groups of 4-6 to solve a problem or make a decision within a specified period of time (e.g. 20-60 minutes) (Thornton & Mueller-Hanson, 2003). The LGD is a technique that dates back to German military officer selection programs in the 1920s (Bass, 1954). The LGD was later used by Bass (1950, 1954) to assess emergent leadership and played an integral role in many of the early assessment center programs (Thornton & Byham, 1982). Today, although still a popular technique for assessing managerial candidates, use of the LGD has expanded to non-supervisory positions as employees at all levels are expected to demonstrate teamwork and leadership skills (Thornton & Mueller-Hanson, 2003).

Bass and colleagues performed several studies in the early 1950's looking at issues within LGDs, such as the effect of the number of discussants per group, seating arrangement, and the reliability of the LGD (Bass, 1954). Despite their popularity and continued use within the AC, few studies have examined LGD exercises since then. A few exceptions include studies exploring rater reliability (e.g. Jones, 1981; Herriot,

Chalmers, & Wingrove, 1985) and training effects on ratings in LGDs (e.g. Petty, 1974; Kurecka, Austin, Johnson, & Mendoza, 1982). In one of the more recent studies focusing on the LGD, Gatewood, Thornton and Hennessey (1990) found consistent ratings of LGD participants both within assessor groups and between different assessor groups.

One of most important underlying characteristics of AC LGDs is the competitive nature of the exercise (Schneider & Schmitt, 1992; Sackett & Harris, 1988). Some ACs even incorporate multiple LGD exercises, one that is more cooperative and one that is more competitive in nature (e.g. Spector et al., 2000; Goldstein et al., 1998). Stewart and Barrick (2004) argue that situational differences may be represented by cooperative versus competitive demands, and that this perspective can be useful for broadly distinguishing between work settings.

From a theoretical perspective, socioanalytic theory (Hogan, 1983) suggests that two broad motive patterns translate into behavior to get along (cooperate) with other members of the group and to get ahead (compete), or achieve status vis-à-vis other members of the group. Although most people may try to get along and get ahead while interacting with others, there are substantial differences in how their efforts are perceived and evaluated by others (Hogan & Holland, 2003).

Thornton and Mueller-Hanson (2004) also distinguish between assigned-role and non-assigned role LGDs. In their framework, an assigned role LGD refers to a competitive situation where each participant has an individual goal (e.g. secure the biggest raise for one's subordinate) and a group goal (e.g. come to agreement on how to allocate the limited funds based on the company's best interests). In competitive LGDs, the goal attainment probabilities are negatively correlated and goal conflict is present

(Schneider & Schmitt, 1992; Johnson et al., 1981). On the other hand, in non-assigned role LGDs all participants work toward a common goal and goal attainment probabilities are positively correlated. These LGDs would be considered non-competitive (or more cooperative) exercises.

Table 2 summarizes how different design characteristics of a LGD can influence the competitive nature of the LGD exercise. More competitive exercises put participants in a group situation where there is goal conflict between accomplishing their individual goal and reaching group consensus, while non-competitive exercises reduce or eliminate this goal conflict and allow individuals to focus on the group goals. Based on the above discussion, the effects of the competitive nature of LGD exercises will be manipulated and explored in this study.

<< Insert Table 2 about here >>

Oral Presentation. In oral presentation exercises, participants are asked to prepare for and deliver a formal, “stand-up” speech about some subject matter (Thornton and Mueller-Hanson, 2004). The oral presentation can be a stand-alone exercise or part of another exercise. Kudisch et al. (1999) found that oral presentations were the most popular type of interpersonal simulation exercise among their survey respondents (as cited in Thornton and Mueller-Hanson, 2004).

According to Thornton and Mueller-Hanson (2004), there are two common types of presentation exercises: self-contained and advance-preparation. In the advance-preparation arrangement the participant is given instructions several days or weeks prior

to the assessment event. In the self-contained arrangement the instructions, preparations, and presentation take place in one location in a relatively short period of time (e.g. within a couple hours), although the length of time the participant is given to prepare can vary (Thornton and Mueller-Hanson, 2004). The self-contained presentation is the type of exercise used in this study.

Dimensions Assessed in Exercises

A number of studies have used factor analysis to examine the underlying common factors of the dimensions (it was not uncommon for the early ACs to assess 10-20 dimensions) included in the study (Thornton & Byham, 1982). Although it is somewhat difficult to compare factors across studies due to differences in exercises, samples, and dimensions, Thornton & Byham (1982) summarized the factor analytic results of eight studies. They concluded that these studies identified a set of administrative skills (such as decision-making), an interpersonal factor that included dimensions such as oral communication and behavior flexibility, and a factor related to amount of activity (e.g. aggressiveness, energy) as three common primary factors.

Although many studies use more than these three dimensions, a few studies (Jansen & Stoop, 2001; Schneider & Schmitt, 1992; Larsh, 2000) have focused solely on three dimensions that are similar to the underlying factors identified by Thornton & Byham (1982). Researchers have pointed out that using fewer dimensions can increase rater accuracy and improve the ability of assessors to discriminate between dimensions (Woehr and Arthur, 2003; Gaugler & Thornton, 1989). For the present study we are most interested in those dimensions that are common to both the oral presentation and LGD

exercises. Therefore, the following two dimensions will be the focus as dependent variables in this study:

Critical Thinking. Reflects the ability to prioritize issues, secure relevant information, relate data from different sources, and identify possible causes of issues. Evidence of effective critical thinking includes defining decision criteria, explicating the strengths and weaknesses of an initiative, providing logical reasons for recommendations, and considering the implications of actions before making a decision.

Oral Communication. Refers to expressing ideas to an individual or group in a manner that clearly relays the intended message. This includes using appropriate non-verbal gestures and consistent eye contact to support the speaker's message. Effective oral communication will be evidenced by clear, confident speaking at an appropriate pace using proper grammar.

Hypotheses

The hypotheses relate the variable of individualism-collectivism to critical thinking and the individual characteristic of communication apprehension to both critical thinking and oral communication. These relationships are moderated by exercise content and exercise form, respectively.

Individualism-Collectivism

The International Task Force on Assessment Center Guidelines (2000) is currently considering how to revise its guidelines based on cross-cultural considerations.

Considering the increasingly multicultural workforce and multi-national environments of many organizations, Briscoe (1997) notes that it is surprising that very little attention has been paid to the impact of cultural variables in the design of ACs.

This research focuses on the individualism- collectivism cultural dimension. Although individualism-collectivism has been mostly studied across cultures (e.g. Hofstede, 1980), a body of research has also developed in which U.S. researchers have examined differences within a single culture (Wagner, 1995). Wagner (1995; p. 153) defines collectivism as occurring “when the demands and interests of groups take precedence over the desires and needs of individuals.”

Compared to individualist cultures, collectivist cultures place greater emphasis on the needs and goals of the group and cooperation with group members (Triandis, 1989). Collectivists are more likely to sacrifice personal interest for the attainment of group goals and enjoy doing what the group expects of them (Cox, Label, & McLeod, 1991). The motto that some people from collectivistic cultures live by is “the nail that stands out gets pounded down.” Individualists are more task achievement oriented, sometimes at the expense of relationships, whereas collectivists put more emphasis on harmonious relationships, sometimes at the expense of task accomplishment (Triandis, 1995; Chen, Chen, & Meindl, 1998).

The competitive exercises focus on individual goals, in which the goal attainment probabilities are negatively correlated (i.e. zero-sum). For these competitive exercises, individualists’ values will be most congruent with these individual goals and these individuals should be most effective in demonstrating the appropriate behaviors. However, collectivists value the interest of the group over those of the individual, and

this value incongruence is likely to reduce behaviors that would make them more effective in competitive situations.

Compared to non-competitive exercises where there is little goal conflict and a focus on the group goals, in competitive exercises the need for participants to influence others to their position may be essential to demonstrating problem solving and critical thinking in the exercise. In situations where conflict is present, individualists prefer direct methods of problem solving and negotiations, as well as to have control over the process (Earley & Gibson, 1998). In other words, participants with more collectivist orientations in the competitive exercises may be less effective in demonstrating critical thinking skills by influencing the group to their perspective since they are willing to sacrifice their self-interests for the group.

On the other hand, the non-competitive exercises focus on group goals and goal attainment probabilities are positively correlated (i.e. non zero-sum). In these exercises, collectivists' values are congruent with group goals and they should be effective in demonstrating the appropriate behaviors.

Hypothesis 1: Exercise content will interact with collectivism, such that the relationship between collectivism and critical thinking will be less positive in the competitive exercises than in the non-competitive exercises.

Communication Apprehension (CA)

In simplest terms, communication apprehension (CA) refers to the unwillingness of an individual to engage in communication (Pate & Merker, 1978). McCroskey (1977)

defined communication apprehension as “an individual’s level of fear or anxiety with either real or anticipated communication with another person or persons” (p. 78).

McCroskey (1976) argued that in comparison to people low in CA, people high in CA are more likely to experience anxiety when required to communicate, avoid situations demanding communication, and engage in less oral communication when such situations are unavoidable.

Some of the first systematic research on CA (e.g. Gilkinson, 1942) primarily focused on stage fright as experienced by students in public speaking courses (Pate & Merker, 1978). The literature from the social psychology, clinical psychology and communication fields has used various terms such as shyness, speech anxiety, social phobia, and reticence. More broadly, Leary and Kowalski (1995) believe that these phenomena are all manifestations of social anxiety, which arises from the prospect or presence of interpersonal evaluation in real or imagined social settings.

Studies by Daly (1978) and Leary (1983) demonstrated that measures of social anxiety and communication apprehension were highly correlated and appeared to reflect the same general construct. For example, a popular measure for social anxiety that measures a person’s level of distress in and avoidance of social situations (the Social Avoidance and Distress Scale or SAD; Watson & Friend, 1969) was highly correlated ($r=.63$) with the McCroskey’s (1978) 25-item Personal Report of Communication Apprehension (PRCA) (Daly, 1978).

Turner, Beidel, and Larkin (1986) point out that there are a significant number of individuals who experience distress in social settings but their social anxiety does not reach “phobic proportion.” They found that two socially anxious groups who were

recruited through different methods (i.e. clinical and questionnaire) demonstrated similar patterns of cognitions and physiological reactivity across two interpersonal interactions and a speech. Turner et al. (1986) concluded that the degree of social anxiety experienced was similar across the group of individuals seeking clinical treatment and the group of individuals identified as socially anxious based on their self-reported responses to social anxiety scales.

Clinical psychologists have focused more on those individuals who suffer from the most severe forms of social anxiety (or social phobia), while communication researchers have focused on how anxiety impacts individuals in situations specifically requiring oral communication. Beatty, McCroskey, and Heisel (1998) suggest that one of the most well-established linkages in the communication apprehension literature is between CA and self-reported anxiety pertaining to specific communication episodes. Therefore, although the psychology and communication literatures have developed separately, they are related because socially anxious individuals are also likely to have high communication apprehension in social settings.

For the purposes of this research on assessment center exercises, we are most interested in how communication apprehension may influence behavior and performance in these settings. Research has indicated that stress and anxiety are felt in varying degrees by assessees after participating in ACs (Iles, Robertson, & Rout, 1989; Fletcher, Lovatt, & Baldry, 1997). Fletcher (1991) has argued that ACs may have a particularly strong impact on assessees because they have high face validity and are less frequently encountered than more routine selection or developmental tools. In addition, the exercises

are often videotaped, which can increase anxiety. Therefore, it is likely that CA will influence participant behaviors in ACs.

In the AC literature, the author was not able to locate any studies that examined communication apprehension within the AC context. However, Fletcher and Kerslake (1993) found that an individual's anxiety level measured prior to participation in the AC was negatively related to the assessee's overall assessment rating. Also, in the related context of job interviews, studies have found significant negative relationships between CA and interview performance (Ayres & Crosby, 1995; McCarthy & Goffin, 2004).

Considering that most AC exercises include social interactions and require communication with others, those individuals who have higher communication apprehension would be expected to experience anxiety when communicating in AC exercises and to engage in less oral communication within the AC (McCroskey, 1976). For these reasons CA is likely to influence an individual's behavior in ACs.

One of the fundamental concepts of CA is that a person's self-reported score of communication apprehension will influence their communicative behavior. Allen and Bourhis (1996) meta-analytically examined the relationship between CA and communication behavior using 36 studies involving 3,742 participants. They found a consistent negative relationship between the level of CA and both the quality ($r = -.38$) and quantity ($r = -.28$) of communication behavior as well as graded classroom communication ($r = -.15$).

Hypothesis 2a: Communication apprehension will be negatively related to oral communication.

Although researchers have primarily focused on the more visible behavioral consequences of CA, it is also likely that CA will influence the content of the communication (i.e. what is said). For this reason, effective oral communication is likely to be a fundamental prerequisite to performing well on other dimensions within an exercise. For example, effective communication is necessary in order to demonstrate critical thinking skills.

McCroskey's (1982) 24-item Personal Report of Communication Apprehension (PRCA) has been the primary scale used to measure CA over the past two decades. Two items on the PRAC refer to the effect of CA on the thought processes of individuals when giving a speech: "my thoughts become confused and jumbled when I am giving a speech" and "while giving a speech I get so nervous, I forget facts I really know." These items illustrate how CA may have a negative influence on critical thinking. In addition, Beatty & Behnke (1991) state that "a considerable body of research and theory indicates that stressful situations are capable of disrupting information processing" (e.g. Janis, 1982; Sarason, Sarason, & Pierce, 1990).

Using path analysis, Diaz, Glass, Arnkoff, and Tanofsky-Kraff (2001) illustrated that CA had an indirect negative effect on law students' performance on their oral exam. The effect of CA on students' oral exam performance was mediated by the constructs self-efficacy for affective control and state anxiety. Recent conceptualizations of anxiety have suggested that negative cognitions in the form of self-deprecatory thoughts and low self-efficacy may mediate the relationship between individual characteristic variables such as CA and outcomes in these types of situations (Beck & Emery, 1985; Arnkoff,

Glass & Robinson, 1992; Diaz et al., 2001). Therefore, communication apprehension is likely to influence participants' critical thinking ratings in AC exercises.

Hypothesis 2b: Communication apprehension will be negatively related to critical thinking.

The impact of CA may vary depending on the form or type of exercise. Beazley, Glass, Chambliss, and Arnkoff (2001) point out that the role of situational factors on social anxiety and social phobia have received little research within the psychology literature. Most studies have employed either a different-sex interaction, a public speaking task, or have individualized the behavior task in order to target the most anxiety-provoking situation for the individual (Beazley et al., 2001).

In the communication literature, the effects of CA on communication behavior have mostly been explored in the public speaking context, such as giving a speech in the classroom (Allen & Bourhis, 1996). In general, CA studies have demonstrated that factors in public speaking communication situations can have an effect on state anxiety in that situation. CA has been found to be highly predictive of state anxiety across different contexts and usually explains the majority of the variance in situation-specific state anxiety (Beatty et al., 1998; Ayres, 1990; Booth-Butterfield & Booth-Butterfield, 1986). For example, McCroskey and Beatty (1984) had 120 students participate in four different communication contexts. The students participated in a 3-5 minute speech to the class, a class meeting where they were called upon to comment on a presentation, a group discussion with four other classmates, and a getting acquainted interaction with one of

their classmates. Spielberger, Gorsuch, & Lushene's (1969) state anxiety scale (STAI), which is commonly used in the psychology and communication literature to assess state anxiety, was selected as the measure to assess anxiety associated with specific experiences across these four contexts. Results indicated that the students generally experienced more anxiety in the speech and class meeting than in the group or interpersonal interactions. However, few studies have examined the relationship between CA and communication *behavior* across multiple situations.

For the purposes of this study, a presentation exercise consists of one-way communication for a relatively longer time period, whereas the group discussion exercise consists of multiple communication interactions among group members that are shorter in duration. In the presentation exercise, the focus of the audience is directly on the speaker, whereas in the group discussion exercise, the focus is more on the group as a whole. Also, in the group discussion, individuals are given more choice whether to speak as well as when to speak.

Individuals with higher communication apprehension experience anxiety in situations with high communication requirements and in the presence of evaluation (Leary & Kowalski, 1995). The presence of evaluation is likely to be more salient in the presentation than in the group discussion exercise. Therefore, the higher communication requirements and more salient evaluation of the presentation exercise is likely to cause the stress level of individuals with communication apprehension to be higher in the presentation exercise than in the group discussion exercise. This higher stress in the presentation exercise is hypothesized to reduce the ability of participants to demonstrate oral communication and critical thinking skills.

Hypothesis 3a: Exercise form will interact with communication apprehension, such that the negative relationship between communication apprehension and oral communication will be stronger in the presentation exercise than in the group interaction exercise.

Hypothesis 3b: Exercise form will interact with communication apprehension, such that the negative relationship between communication apprehension and critical thinking will be stronger in the presentation exercise than in the group interaction exercise.

Beatty et al. (1998) have proposed that CA is related to the personality dimensions of extraversion/introversion and emotional stability/neuroticism. Avoiding social interaction represents a manifestation of introversion while feelings of anxiety are a manifestation of neuroticism.

Several studies have shown moderate to high negative correlations between CA and both emotional stability and extraversion (Beatty et al., 1998; Neuliep, Chadour, McCroskey, & Heisel, 2000; Hsu, 2004). For example, using Costa & McCrae's (1992) Revised NEO Personality Inventory, Hsu (2004) found correlations of .47 with neuroticism and -.55 with extroversion in a U.S. sample of college students. In addition, these two personality traits have explained about 45 to 75 percent of the variance in CA in previous studies (Beatty et al., 1998; Neuliep et al., 2000; Hsu, 2004).

Collins et al. (2003) found that emotional stability and extraversion were the most highly correlated of the Big Five dimensions with AC overall assessment ratings. Given the consistent correlations of AC performance scores with the personality traits extraversion and emotional stability, communication apprehension would be expected to be a mediating variable that could improve our understanding of why more extraverted and emotionally stable individuals perform better in the AC context.

Hypothesis 4a: Extraversion will be negatively related to communication apprehension.

Hypothesis 4b: Emotional stability will be negatively related to communication apprehension.

Hypothesis 4c: Communication apprehension will mediate the positive relationships between both extraversion and emotional stability on critical thinking.

Hypothesis 4d: Communication apprehension will mediate the positive relationships between both extraversion and emotional stability on oral communication.

CHAPTER 3: METHODOLOGY

Sample

Participants consisted of 282 juniors and seniors recruited from an upper-level undergraduate management course at Indiana University. In exchange for their participation, students received credit to meet the research requirement of the course. The sample was 58 percent male and 83 percent Caucasian. Also, approximately 67 percent of the participants were business majors while 33 percent were non-business majors.

Procedure

As part of the course requirement, these students participate in a 2 ½ -hour developmental assessment center, in which they play the role of a company vice president. All students participate in the oral presentation and leaderless group discussion exercise, which are the exercises used in this study. In addition, the students respond to several in-basket items (e.g. memos, e-mails) and participate in a question and answer presentation, which are not part of this study. Their performance in the assessment center is evaluated and 10% of their grade is based on their overall performance. Students also receive developmental feedback on their performance from all the exercises.

About one month before the assessment center, participants completed a questionnaire containing the individual difference measures. In addition, a short questionnaire containing measures of motivation to perform well in the AC was completed immediately prior to the assessment center. Immediately following participation in the assessment center, participants completed the manipulation check measures. These measures assessed participants' perceptions of the how competitive the

LGD and presentation exercises were as well as how stressful the exercises were for them (see Appendix A for these measures).

Assessment center participants are given a background packet with information about the company in which they will role-play several days in advance. This material does not contain key information that they will need to prepare and give their presentations. In order to increase the realism of the setting, participants receive a packet of in-basket memos and items at the beginning of the assessment center. These memos give them more information about the time and topic of their oral presentation and group discussion exercises.

Although each participant completed one LGD and one oral presentation exercise, for logistic reasons, they participated in the assessment center exercises in a different order. Participants were randomly assigned to only one of the four cells in Table 1. The sample consisted of 68 participants assigned to the competitive oral presentation and 68 assigned to the non-competitive oral presentation, while 74 participants were assigned to the competitive LGD and 72 participants were assigned to the non-competitive LGD exercise. It was not possible to assign exactly the same number of participants to each exercise due to the logistic requirements of running the assessment center. In order to avoid any potential effects from previous exercises, the exercise that the student was assigned to was the first exercise that the student participated in. Therefore, a between subjects design was employed, as each participant received only one score on each of the dependent variables (i.e. oral communication and critical thinking dimension scores).

Exercises

Competitive & Non-competitive LGD Exercises. For the leaderless group discussion, participants were given materials when they arrived and were given seven minutes to prepare for group discussion (see Appendix B for both versions of the LGD exercise). Four or five participants were given 17 minutes to complete the group discussion, which was videotaped. The Salary-Increase Allocation LGD exercise was adapted from Beatty and Schneier (1981) and an updated version of this exercise by Bracken (1989). Bracken (1989) states that this LGD exercise was prepared by Development Dimensions International (DDI). This exercise includes typical LGD content in that participants are required to decide how to allocate limited resources (Thornton & Mueller-Thompson, 2004). I updated the dollar amounts and other details of this exercise and modified it for this research.

The same exercise was used for both LGD exercises, so that the only difference was in the competitive nature of the exercise (Schneider & Schmitt, 1992). This was accomplished, as the only difference between the two LGD versions is the instruction page paragraph that manipulates the competitive nature of the exercise.

Competitive & Non-competitive Oral Presentation Exercises. Participants were given approximately 20-minutes to prepare for a three or four minute oral presentation regarding a potential market for the company's international expansion (see Appendix C for both versions of the oral presentation exercise). This presentation has been used successfully in several past ACs. The presentation exercise was given to three or four other participants and was videotaped.

Again, the goal is to use the same exercise for both oral presentation exercises so that the only difference would be in the competitive nature of the exercise (Schneider & Schmitt, 1992). This was accomplished, as the only difference between the two versions is the paragraph on the instruction page that manipulates the competitive nature of the exercise.

Independent Variable Measures

This section provides information regarding the measures for the independent variables of the study. Scale items for these variables are provided in Appendix A.

Individualism-Collectivism. This research used a 10-item scale of individualism-collectivism from Wagner (1995). These items were originally developed by Wagner and Moch (1986) before being slightly modified by Wagner (1995). The Wagner and Moch (1986) scale operationalizes individualism-collectivism as the difference between the focus on self versus group interests in a group context. Wagner and Moch (1986) identified three structural dimensions reflecting a respondent's individualistic-collectivistic beliefs, values and norms, which are three (of the five) distinct factors in the Wagner (1995) scale. The first dimension assesses *beliefs* about the effects of personal pursuits on group productivity. The second dimension measures respondents' general preferences about working in a more collectivistic versus individualistic environment. The third dimension assesses the espousal of norms about the subordination of personal needs to group interests.

In this study, higher scores on each item will be scored to reflect respondents' orientations toward collectivistic tendencies, whereas lower scores will reflect more

individualistic tendencies. Wagner and Moch (1986) provided evidence for the scale's construct validity and Wagner (1995) reported reliabilities that were all above .75 for each of the scale's three dimensions.

Extraversion and Emotional Stability. We measured extraversion and emotional stability using the 10-item scales of Goldberg's (1999) Big Five factor markers in the International Personality Item Pool (IPIP). Item responses require respondents to indicate how accurately the item describes them on a five-point scale, from 1 (very inaccurate) to 5 (very accurate).

Goldberg (1999) reported the mean coefficient alpha for each of the five scales (10-items each) to be .80, indicating an acceptable degree of internal consistency. Goldberg (1999) reported strong convergent validity evidence with Big Five measures developed by Costa and McCrae (1992). Specifically, the average correlation between corresponding scales in the two sets of measures was .73. Goldberg (1999) calculated that this figure would translate into an average correlation of .94 when corrected for attenuation due to the unreliability of the various scales.

Communication Apprehension. The Personal Report of Communication Apprehension (PRCA-24) measures communication apprehension (McCroskey, 1982). An individual's CA score on the PRCA-24 is determined by summing responses across all four contexts (giving a speech, talking in meetings, participating in group discussions, and conversing with others). This overall CA scale score was used in this study.

Research supports that the PRCA-24 is internally consistent and reliable. Alpha reliability coefficients ranging from .93-.95 have been reported (McCroskey, Beatty, Kearney, & Plax, 1985). Alpha coefficients are only slightly lower for the four communication contexts (McCroskey & Beatty, 1984). Test-retest coefficients greater than .80 have been reported (Rubin, Graham, & Mignerey, 1990), indicating that the measure is stable across time.

Control Variable Measures

This section provides information regarding the measures for the control variables of the study. Scale items for English as a second language and motivation are provided in Appendix A.

Cognitive ability. Cognitive ability was controlled by using scores from the Wonderlic Personnel Test (WPT, 2000), a 12-minute timed test consisting of 50 items, scored as the number of correct responses. It is correlated (range = .85 to .93) with the Wechsler Adult Intelligence Scale full scale (Dodrill, 1981; Dodrill & Warner, 1988) and has shown strong test-retest reliability (Dodrill, 1983) and validity (McKelvie, 1989). Based on 8 studies, a meta-analysis by Bourhis and Allen (1992) found a small negative relationship between CA and intelligence test scores. Since cognitive ability would also be expected to be related to both participants' CA and oral communication and critical thinking dimension scores, it was included as a control variable in the study.

English as a second language. English as a second language was also controlled because these individuals may be more likely to have communication apprehension and

perform less well in the exercises due to the added requirement of speaking in their non-native language. This was measured using a single item that asked whether English was spoken as a native language or as a second language.

Motivation. Motivation to perform well in the AC may be related to CA and the dimension ratings as well, so it was included as a control variable. Motivation was measured using a three-item scale that had an alpha coefficient of .70 in previous research by the author.

Dependent Variable Measures

The dependent variables for this study are oral communication and critical thinking. The behavioral anchors for these dimensions are listed below. The specific examples of each of these dimension behavioral anchors applied to each exercise are listed in Appendix D.

Behavioral anchors for oral communication:

- Speaks with appropriate volume and enunciates words clearly
- Uses voice inflection; speaks confidently and enthusiastically
- Maintains eye contact and does not read material
- Avoids distracting pauses and language fillers
- Displays appropriate non-verbal behaviors

Behavioral anchors for critical thinking:

- Identifies decision criteria and key underlying issues.

- Integrates appropriate information into comments and recommendations.
- Uses sound logic to support recommendations and considers potential consequences of recommendations
- Makes concluding statements that logically follow from preceding comments
- Does not make unrealistic comments or skew information

Rating Procedure

The exercises in this study were videotaped for later viewing by assessors. Three assessors were recruited, one had a Masters degree in I/O Psychology and two were graduate students in I/O Psychology. One assessor rated all participants in the presentation exercise while another assessor rated all participants in the LGD exercise. The third assessor rated all participants from both the LGD and Presentation exercise. The assessors were paid for their participation.

Assessors received one half-day of frame-of-reference (FOR) training for each exercise. Initially proposed by Bernardin and Buckley (1981), the primary goal of FOR training is to eliminate idiosyncratic standards held by raters and replace them with a common frame of reference for rating. There is consistent evidence that FOR training increases rater accuracy (Woehr & Huffcutt, 1994; Schleicher, Day, Mayes, & Riggio, 2002). This training included a description of the exercise, including a videotaped demonstration. Copies of the dimension definitions and behavioral anchors were distributed, and the dimension definitions and scale anchors were reviewed. Behaviors pertaining to different effectiveness levels for each dimension were also discussed.

Assessors then practiced rating a videotaped exercise of four or five assesseees with their new frame of reference. The assessors were instructed to evaluate each

assessee after each exercise on each performance dimension. After each exercise, assessors were asked to share their ratings with the purpose of discussing them to clarify any discrepancies and provide feedback on the appropriate effectiveness level on each dimension portrayed by each assessee. Lastly, assessors viewed another videotape of the four or five target assesseees in the exercise and independently provided ratings on each dimension by using the behavioral anchors. The overall goal of this training was to create a common performance theory among assessors so that they would agree on the standards used to evaluate assesseees' behaviors.

Assessors used behavioral checklist scoring guidelines (composed of examples of high, typical, and low behavioral anchors for each dimension and for each exercise) to assign an integer rating on a 5-point rating scale (5 = *high*; 1 = *low*) for each dimension immediately after viewing an exercise. Two assessors observed and rated participants independently, allowing for estimates of interrater reliability. Similar to past research (e.g. Schneider & Schmitt, 1992), the average of the two ratings for each dimension within an exercise was used as the assessee's score.

Analyses

Hierarchical multiple regression analysis (Baron & Kenny, 1986) was used to test the hypotheses examining the moderating effects of exercise form and exercise content (i.e. Hypotheses 1 and 3), as well as the main effects of CA on the dimension scores (i.e. Hypothesis 2). Structural equation modeling was used to test the hypotheses involving mediation (i.e. Hypothesis 4).

CHAPTER 4: RESULTS

Manipulation Checks

Table 3 reports the results of the manipulation check items. The alpha reliabilities for the constructs assessing the perceived competitiveness and stress of the exercises were high, ranging from .73 to .86. All of the t-tests were significant at $p < .01$, indicating that participants of the competitive exercises did perceive them to be more competitive than participants in the non-competitive exercises. In addition, the presentation exercise was perceived to be more stressful than the group discussion exercise. Overall, these data indicate that the exercise manipulations were effective.

<< Insert Table 3 about here >>

Correlations and Descriptive Statistics

Means, standard deviations, intercorrelations, and scale reliabilities are reported in Table 4. Note that the oral communication score in this table includes the oral communication scores from both the group and presentation exercises, so the scale reliability for oral communication represents the average reliability from the two exercises. This is also the case for the critical thinking score. The reliabilities for both the oral communication and critical thinking scores are discussed in more detail below.

<< Insert Table 4 about here >>

Interrater Reliability

Intraclass correlations were calculated for each dimension by exercise as a measure of interrater reliability. These were calculated by treating the two independent assessors' ratings as items for each of the dimensions. For the presentation exercise, the reliabilities based on independent ratings were .78 and .71 for the oral communication and critical thinking dimensions, respectively. For the group discussion exercise, the reliabilities based on independent ratings were .89 and .79 for the oral communication and critical thinking dimensions, respectively.

To maximize the reliability of these ratings, in instances where there was greater than one point difference in the assessors' ratings (e.g. rater A assigned a 5 while rater B assigned a 3), the raters were asked to refer to their notes and discuss these cases and make a subsequent rating. Three and seven percent of the ratings (4/136 and 9/136) for the oral communication and critical thinking dimensions in the presentation had differences greater than one. After the raters discussed these cases and made another rating, reliabilities increased to .83 and .79 for the oral communication and critical thinking dimensions, respectively. For the group discussion exercises, zero and one percent of the ratings (0/146 and 2/146) for the oral communication and critical thinking dimensions had differences greater than two. After the raters discussed these cases and made another rating, reliabilities were .89 and .81 for the oral communication and critical thinking dimensions, respectively.

The reliabilities reported in Table 4 are those based on the ratings made after discussing any case with greater than a one point difference. The average reliability for oral communication was .86 (mean of .83 and .89) and the average reliability for critical

thinking was .80 (mean of .79 and .81). These reliabilities are consistent with previous assessment center research and are in an acceptable range (Schneider & Schmitt, 1992; Borman, 1982).

Hypotheses Testing

Table 5 contains the results of the hierarchical multiple regression analyses for both oral communication and critical thinking. In Step 1, the control variables were entered into the analysis. Step 2 includes the main effects of exercise form and exercise content, as well as collectivism and communication apprehension. Finally, the hypothesized 2-way interactions were entered into the regression.

Note that English as a second language was significant ($p < .01$) in the model with oral communication as the dependent variable, and marginally significant ($p < .10$) when critical thinking was the dependent variable. General mental ability was significant ($p < .05$) in the model with critical thinking as the dependent variable, but not in the model with oral communication as the dependent variable. Motivation to perform well in the assessment center was not significant in either of the models.

<< Insert Table 5 about here >>

Hypothesis 1 posits that exercise content, or the competitiveness of the exercise, would negatively moderate the relationship between collectivism and critical thinking. The beta in Model 2c is not significant, so no support is found for this hypothesis.

Hypotheses 2a and 2b predict that communication apprehension will be negatively related to oral communication and critical thinking scores. Models 1b and 2b

test these hypotheses. Both of these hypotheses are supported, as the Beta coefficient for communication apprehension is significant and negatively related to both oral communication ($\beta = -.15, p < .05$) and critical thinking ($\beta = -.21, p < .01$).

Hypotheses 3a and 3b predict that communication apprehension will interact with exercise form. The Beta coefficient in Model 1c, with oral communication as the dependent variable, was not significant. Thus, hypothesis 3a is not supported. The Beta coefficient in Model 2c with critical thinking as the dependent variable is significant ($\beta = -.19, p < .05$). Before interpreting the form of this 2-way interaction, I performed another regression analysis to see if the 3-way interaction between exercise content, exercise form and communication apprehension was significant (the other 2-way interactions were also included in this regression). The 3-way interaction was not significant, so I proceeded to explore the 2-way interaction to better understand its form (Aiken and West, 1991).

The form of the interaction between communication apprehension and exercise form is plotted in Figure 2. This plot does not support the predicted form of Hypothesis 3b, which states that the negative relationship between communication apprehension and critical thinking would be stronger in the presentation exercise than in the group discussion exercise. Specifically, the plot shows that the slope of the line representing the group discussion exercise is more negative than the slope of the line representing the presentation exercise.

<< Insert Figure 2 about here >>

Hypotheses 4a and 4b state that extraversion and emotional stability will be negatively related to communication apprehension. Hypotheses 4c and 4d predict that communication apprehension will be a mediator between extraversion and emotional stability and the dimension scores for critical thinking and oral communication. In order to test these hypotheses, the two models in Figure 3 were estimated with LISREL 8 (Jöreskog & Sörbom, 1996) structural equation software. The two-step approach was followed where the confirmatory factor analysis (CFA or measurement model) specifying the measurement relationships between the constructs and its measures is specified and then the theoretical model with the structural relationships is estimated (Anderson and Gerbing, 1988).

To determine the extent to which the data conformed to the predictions for the measurement and structural models, I examined a variety of goodness-of-fit indices. Because these various indexes differ on their specific assumptions, the use of multiple relative and absolute indexes when evaluating a model can provide convergent evidence in the assessment of model fit. The indexes used included Bentler's (1990) comparative fit index (CFI), Bentler and Bonett's (1980) nonnormed fit index (NNFI), Jöreskog and Sörbom's (1986) standardized root-mean-square residual (SRMR), and Steiger's (1990) root-mean-square error of approximation (RMSEA). The values of NNFI and CFI range from 0 to 1.0, and values exceeding .95 are interpreted as indicating a good fit to the data. The SRMR is a measure of the average standardized residuals, that is, the difference between elements of the predicted covariance matrix and the observed covariance matrix. Values less than .08 or .09 indicate a good fit to the data (Hu and Bentler, 1999). The RMSEA is a measure of the average size of the fitted residuals per degree of freedom.

Brown and Cudeck (1993) suggested that RMSEA values of .05 or less indicate a close fit and values of up to .08 indicate a reasonable fit, while Hu and Bentler (1999) recommend a cutoff value close to .06. Standardized path coefficients were examined to determine the degree of relatedness among the constructs in the model.

Note that communication apprehension was modeled as a second-order reflective construct with four first-order sub-dimensions with reflective indicators (MacKenzie, Podsakoff, & Jarvis, 2005). Also, the control variables (not shown in Figure 3) were also included in the analyses. Table 6 contains the standardized factor loadings for the CFA models. The results for both the model with oral communication and critical thinking had virtually identical factor loadings, so the results are presented in one table.

<< Insert Table 6 about here >>

The hypothesized measurement factor loadings were all statistically significant and substantial in size and construct reliabilities were large, providing evidence of convergent validity of the constructs. In addition, the average shared variance for each construct was greater than the square of the correlations between the other constructs, indicating an adequate level of discriminant validity for the constructs in this study (Fornell and Larcker, 1981).

Table 7 contains the fit statistics for the CFA models as well as the final theoretical models. The CFA results demonstrate that the models fit the data quite well. The goodness-of-fit indices showed that the model adequately accounted for the sample variances and covariances.

<< Insert Table 7 about here >>

The theoretical models also fit the data well. The goodness-of-fit indices showed that the model adequately accounted for the sample variances and covariances. For the control variables, consistent with the regression analysis, English as a second language was significant ($p < .01$) in the model with oral communication as the dependent variable and general mental ability was significant ($p < .05$) in the model with critical thinking as the dependent variable. However, in the SEM model English as a second language was also significant ($p < .05$) with critical thinking as the dependent variable.

As seen in Figure 3, the structural relationship between extraversion and communication apprehension was negative and significant ($\beta = -.61, p < .01$), supporting Hypothesis 4a. Also, the structural relationship between emotional stability and communication apprehension was negative and significant ($\beta = -.28, p < .01$), supporting Hypothesis 4b. Hypotheses 4c and 4d were tested by adding the direct relationships between extraversion and emotional stability to the dimension scores and looking at the significance of these relationships. None of these four path coefficients were significant, indicating that communication apprehension completely mediated the effects of extraversion and emotional stability on both the critical thinking and oral communication scores. These findings support Hypotheses 4c and 4d. Also, the structural relationships in Figure 3 between communication apprehension and both the oral communication ($\beta = -.22$) and critical thinking ($\beta = -.26$) scores were significant ($p < .01$). This is consistent with the results from the regression analyses and supports Hypotheses 2a and 2b.

<< Insert Figure 3 about here >>

The squared multiple correlations for critical thinking and oral communication in the structural equation models was .11 and .09, respectively. In addition, 44 percent of the variance in communication apprehension was explained in the model.

Exploratory Analyses

Finally, I examined the results of some exploratory regression analyses of the 2-way and 3-way interactions that were not specifically hypothesized (i.e. between exercise form, exercise content, and both CA and collectivism). Interestingly, there was a significant ($p < .05$) 2-way interaction between collectivism and exercise form for both dependent variables. These interactions were in the direction that would be expected, in that there was a positive relationship between collectivism and participants' oral communication and critical thinking scores in the group discussion exercise but not in the presentation exercise.

In addition, with oral communication as the dependent variable, the 3-way interaction of collectivism, exercise content, and exercise form was significant ($p < .05$). Most notable here is that, for the group discussion exercise, there was a positive relationship between collectivism and participants' oral communication scores in the non-competitive group discussion but not in the competitive group discussion. For the presentation exercises, there was a negative relationship between collectivism and oral communication in the non-competitive presentation and a positive relationship between collectivism and oral communication in the competitive presentation.

CHAPTER 5: DISCUSSION

I begin this chapter with a brief summary of the key findings, followed by a detailed discussion of the control variables, each hypothesis and the exploratory analyses. I close with a discussion of the limitations of the study, implications for theory and practice, and directions for future research.

Overall, the results showed that exercise form moderated the relationship between communication apprehension and participants' critical thinking scores. This result demonstrates that participant performance can vary across exercises depending on salient exercise characteristics and the individual characteristics of the assessees. Findings also support the notion that actual differences in participants' performance across situations can help explain the lack of construct validity reported in the prior assessment center research (Lance et al., 2000). In addition, communication apprehension completely mediated the relationships between the Big Five personality traits extraversion and emotional stability and participants' scores on their critical thinking and oral communication scores. This finding provides a plausible reason for why extraversion and emotional stability have been strong predictors of AC performance and suggests that communication apprehension should be considered in future assessment center research.

Discussion of Findings

Control Variables. The analysis of the control variables (English as a second language, cognitive ability, and motivation) in the study produced some interesting results. The negative relationship of English as a second language with the dimension scores indicates that participants who struggle with the language used in the assessment center exercises are likely at a disadvantage in those exercises. In other words, lower

scores on dimensions such as oral communication and critical thinking could be caused by a participant's uncertainty with the language. This finding confirms the too often neglected notion that language issues may hinder the accurate assessment of participants who are not native speakers.

This finding is of increasing importance as assessment centers are now frequently being used in cross-cultural contexts and to evaluate diverse applicants (Briscoe, 1997). Therefore, careful attention should be paid to how language difficulties or differences could influence participant performance. For example, differences could occur in the amount of time needed to prepare for an exercise (due to slower reading comprehension) or for the amount of time needed to demonstrate behaviors in an exercise if language slows delivery. Ideally, participants should meet a minimum requirement of language proficiency for the language that is used in the AC before judgments are made about their performance.

Consistent with previous research, cognitive ability was positively related to participants' critical thinking scores. However, cognitive ability was *not* significantly related to scores on the oral communication dimension. This finding is consistent with the conceptual notion that the critical thinking dimension would be expected to be more closely related to cognitive ability than would the oral communication dimension.

Motivation did not influence participants' dimensions scores. This is likely due to the fact that participants were motivated to perform well in the assessment center exercises. More specifically, the mean was 3.96 and the standard deviation was .63 for motivation, indicating that on average participants agreed that they were motivated to perform well in the assessment center.

Hypothesis One. Results of the current study did not support Hypothesis 1, which stated that the competitiveness of the exercise would negatively moderate the relationship between collectivism and critical thinking. Even though participants' perceptions of the competitiveness of the competitive versus non-competitive exercises were significantly different (see Table 3), the average value of participants' perceived competitiveness was only 3.0 in the competitive group discussion and 2.8 in the competitive presentation exercises. On the 5-point scale, these values correspond with the anchor "neither agree nor disagree." This means that although the participants did perceive the non-competitive exercises as being non-competitive, on average they did not agree (or disagree) that the competitive exercises were competitive.

Therefore, despite the fact that participants did perceive a difference in the competitiveness of the exercises, one reason that this hypothesis may have not been supported was that the manipulation of the competitiveness of the exercises was not strong enough. Although I was able to take advantage of a naturally occurring AC setting with real stakes (i.e. grade), I was limited in the extent to which I could manipulate the competitiveness of the exercises due to the desire to make the assessment experience as similar as possible for all participants in the course. Considering that the competitiveness of existing AC exercises is likely to vary, future research should examine this phenomenon in exercises that would be perceived as being more competitive.

Hypothesis Two. As hypothesized in 2a and 2b, those with higher communication apprehension did receive lower scores for both oral communication and critical thinking.

The finding that high communication apprehension is negatively related to participants' ability to demonstrate oral communication skills in an assessment center setting is consistent with previous research (Allen & Bourhis, 1996). The finding that communication apprehension is also negatively related to participants' ability to demonstrate critical thinking in an assessment center setting is especially interesting. This is because one might expect that a person's critical thinking score would be impacted by characteristics such as cognitive ability, but it may not be as apparent that communication apprehension would also influence it. However, most AC exercises (e.g. role-play exercises, presentations, LGDs) have high communication requirements and are likely perceived by many participants to be stressful. Therefore, in these exercises where effective oral communication is necessary to demonstrate critical thinking and other dimensions (e.g. organization and planning) that may be assessed, it is possible that CA could influence all of participants' dimension scores within an exercise.

Hypothesis Three. Hypotheses 3a and 3b predicted that communication apprehension would interact with exercise form (presentation vs. group discussion). The underlying mechanism behind these hypotheses was the perceived stress of the exercise. It was hypothesized that a more stressful situation would cause the relationship between communication apprehension and the dimension scores to be more negative.

As predicted, the manipulation checks did show that participants perceived the presentation exercise to be more stressful than the group discussion exercise (see Table 3). However, for the oral communication score, the interaction between exercise form and CA was not significant, so there is no evidence that this stress level influences oral

communication skills differentially across exercises. In other words, CA was negatively related to the oral communication dimension rating in both exercises. On the other hand, there was a significant interaction for the critical thinking dimension, but not in the predicted direction. CA had more of a negative impact on the demonstration of critical thinking in the group discussion exercise than in the presentation exercise.

In retrospect, this could have occurred for several reasons. First, in the presentation exercise everyone had the same amount of time to speak and display their critical thinking. However, in the group discussion individuals are given more discretion *whether* to speak as well as when to speak. It may be that in the group discussion those with higher communication apprehension did not speak as much and therefore did not display their critical thinking skills. This is consistent with past research which has shown that communication apprehension reduces the quantity of communication (McCroskey, 1978; Allen & Bourhis, 1996).

Another important factor may be the timing of when stress occurs for the exercise. It could be that although participants find delivering a presentation to be stressful, their critical thinking has already occurred earlier while preparing the speech. It is likely that preparing their speech would be less stressful to them and that this may have been the time that their critical thinking occurred. If this is the case, it could be that the presentation consists primarily of delivery, and although this is a stressful experience for most participants, the critical thinking occurred earlier in their preparation. On the other hand, although the context of a group discussion is less stressful, there is more of a requirement to continuously process new information throughout the group discussion.

Finally, it is possible that those with higher communication apprehension may have been more meticulous during their preparation time for the speech. Although everyone was given the same amount of time to prepare, those with lower CA and who were not as apprehensive about the speech may not have prepared as much or made as many notes. This could have assisted those with higher CA to perform as well as those with lower CA in their presentations. This would be consistent with previous studies that have shown that those with higher CA take more time to prepare for a speech (Ayres & Robideaux-Maxwell, 1989).

Hypothesis Four. Results show that communication apprehension completely mediated the relationships between extraversion and emotional stability and the dimension scores critical thinking and oral communication. The positive effects of higher extraversion and emotional stability for participants in this sample worked through lower CA to enable them to perform better in the exercises and receive higher dimension scores. Considering that extraversion and emotional stability are the most highly correlated of the Big Five personality dimensions with overall assessment center ratings (Collins et al., 2003), this finding increases our understanding of why extraversion and emotional stability may be so important in the assessment center context.

Exploratory Analyses. The finding that collectivism was positively related to both critical thinking and oral communication scores in the group discussion exercise, but not the presentation exercise, is likely related to the reasoning used for Hypothesis 1. Recall that the underlying mechanism of value congruence was proposed to influence the

behavior of participants who are more collectivistic in the competitive or non-competitive exercises. In the group discussion exercise, collectivistic values would be congruent with the group setting, which likely enabled collectivistic participants to be more effective in demonstrating the appropriate behaviors in the group discussion. On the other hand, the presentation exercise focused on individual performance, so collectivism would not necessarily be expected to be related to performance in this exercise. Similar to the significant interaction between CA and exercise form, this finding also demonstrates that the form of the exercise can interact with individual characteristics of participants' (i.e. collectivism) to influence their performance across exercises.

In addition, for the observed significant three-way interaction with oral communication as the dependent variable, there was a positive relationship between collectivism and oral communication in the non-competitive group discussion, but not in the competitive group discussion. On the other hand, for the presentation exercises there was a negative relationship between collectivism and oral communication in the non-competitive presentation and a positive relationship between collectivism and oral communication in the competitive presentation. The finding for the group discussion exercise is consistent with the fact that participants' collectivistic values are more consistent with a non-competitive situation than a competitive situation. However, the finding regarding the presentation exercises is puzzling and difficult to explain. It may be that collectivistic values are more relevant to exercises in a setting where participants must work together and less relevant in settings where performance is not dependent on others. Therefore, for the group exercise these results also give some support for the notion that more collectivistic values enable participants to be more effective in exercises

(i.e. non-competitive group discussions) where their values are congruent with the appropriate behaviors as determined by the content (or competitiveness) of the exercise.

Limitations

This study uses a student sample, which may limit the generalizability of the findings if the students were not representative of other assessees or not motivated to perform well in the AC exercises. Although upper-level college students may not be comparable to more experienced workers or managerial assessees on some dimensions, it is very possible that these students would within a year be assessed as part of a selection process when graduating from college (e.g. Jansen & Stoop, 2001). Also, it is difficult to recreate the “high-stakes” situation of selection contexts in a classroom setting, so participants’ motivation may have been lower than that of participants in these ACs. However, this study did take advantage of an existing and naturally occurring AC where participants were motivated by the fact that part of their grade in the course depended on their performance. Motivation was included as a control variable and results indicated that the students were motivated to do well in the assessment center exercises. In addition, other published studies in the AC literature have used student samples (e.g. Schneider & Schmitt, 1992).

Another limitation is that the presentation and group discussion exercises were the only two assessment center exercise forms or types used in the design. Although two exercises were sufficient to test the hypotheses in this study, future research is necessary to examine these findings across other exercise forms. Also, the shorter oral presentation exercises used in this study also may be somewhat limited in their ability to represent those used in practice for selection and promotion purposes. In addition, as noted above,

the ability to manipulate the competitiveness of the exercises was limited due to the classroom setting. At the same time, the student sample did allow for more control in manipulating the design of the exercises as well as an adequate sample size to examine the hypotheses. The control needed to test some of the person-situation interactions is provided in the student AC context and this AC context is likely a better “cover story” than other laboratory experiments might provide for testing these hypotheses.

Finally, the mean of CA for this sample is lower than the student national average (2.43 vs. 2.73). This is likely due to the sample being drawn from a top-rated business school and the focus on communication skills throughout the program. This lower mean of CA may be typical of managerial populations since individuals with higher CA would likely tend to self-select themselves out of programs and positions with high communication requirements (Daly & McCroskey, 1975). In any case, the lower average mean of CA would tend to provide more conservative tests of the hypotheses in this study.

Implications for Theory and Practice

In this section, I discuss three theoretical and three practical implications of this study. I first explain the theoretical contributions to assessment center theory, which include implications for AC construct validity, exercise development, and communication apprehension in the AC setting. Then, I discuss how this study’s findings can assist organizations and managers that are utilizing assessment centers.

Theoretical Contributions. First, consistent with interactionist models in social and personality psychology (e.g. Tett & Burnett, 2003), this study demonstrates that

participant performance is likely to vary across exercises depending on salient exercise characteristics and the individual characteristics of the assesseees. This lends support to the notion that actual differences in participants' performance across situations is likely to help explain the lack of construct validity reported in the assessment center literature (Lance et al., 2000; Lievens, Chasteen, Day, Christiansen, 2006). For instance, consider a person with good critical thinking skills and high communication apprehension. In an exercise with low communication requirements, this person may display these critical thinking skills and receive a high score but in another exercise with high communication requirements their rating on critical thinking would likely be lower. This would lead to low convergent validity for the critical thinking dimension, which is consistent with existing data from assessment centers. By examining the interactions of person-centered attributes (i.e. communication apprehension and collectivism) and exercise characteristics (i.e. stress level and competitiveness) on participant behavior, this study takes a first step toward better understanding what the dimension scores represent and why dimension ratings in ACs have generally not been stable across exercises (Lance et al., 2004a).

Second, this study also points to the need for researchers to be more explicit about the nature and content of the exercises used in ACs. A list of exercise characteristics should be developed and reported for each exercise rather than simply reporting a brief description of the exercise. For example, Lance et al. (2000) describe their LGD exercises as, "six assesseees discussed community relations" and "groups of assesseees are production supervisors who meet to discuss a quality control problem." In the case of the LGD, a list of exercise characteristics should include many of the factors in Table 2 that describe the nature of the exercise (i.e. assigned role, individual goal, group goal, goal

conflict). This could result in a taxonomy of exercises and exercise characteristics that would highlight underlying conceptual differences across AC exercises. In addition, as this study demonstrates, examining and reporting participants' perceptions (e.g. stress, competitiveness) of the exercises would also increase our understanding in this area.

Third, the present study highlights the centrality of oral communication to performance in many AC exercises and that these exercises can be viewed by participants as being stressful due to the evaluative nature of these settings. As the communication requirements and the stress levels of exercises can vary, a focus on communication apprehension may assist researchers in understanding the lack of convergent and discriminant validity of dimension scores within AC exercises. In other words, certain exercise forms or content may cause individuals with communication apprehension to perform poorly across all dimensions in one exercise but quite well across all dimensions in another exercise. For example, an individual who has high communication apprehension may do quite well when the communication requirements and stress level of an exercise are lower (e.g. in-basket), but perform poorly in exercises where communication requirements and stress levels are much higher (e.g. presentation, role-play). Put simply, this study suggests that the construct of CA has potential to help us better understand construct validity in ACs.

Practical Implications. The present study suggests a number of implications for practitioners who are using assessment centers. These include how to give feedback to AC participants, what to consider when selecting AC exercises, and how communication

requirements may influence participants' performance. Each of these is discussed in more detail below.

First, in many ACs, feedback is given to participants based on their dimension scores. In fact, Lievens and Thornton (2005) state that “the most pronounced trend in assessment center activities in recent years is the shift in their predominant purpose from selection/promotion to development.” If one purpose of the AC is to diagnose strengths and developmental needs for participants, gaining a better understanding of the construct validity of AC dimensions is necessary to provide accurate feedback (Carrick & Williams, 1999). Despite the lack of convergent and discriminant validity across exercises, practitioners continue to give feedback based on dimensions (Spsychalski et al., 1997). For example, a traditional dimension-oriented scoring report might give feedback to participants based on an overall dimension scores calculated based on behaviors from all the AC exercises. However, a developmental feedback report informed by recent suggestions made by Lievens et al. (2006) and the present study might more instructively consider how underlying exercise characteristics influence participant behavior across situations. For example, a feedback report may state that “you score poorly in competitive situations where you are required to convince others of your perspective but you score quite well in situations where you are required to process complex information under pressure” (Lievens et al., 2006).

This research can also inform practitioners making decisions about which AC exercises to use and how to design them. If a practitioner decides to implement an AC into their organization, currently there is little research to guide decisions regarding which forms of exercises should be chosen and what underlying content characteristics in

each exercise should be implemented. This study suggests that the stress levels across exercises may differ and that the nature of the communication requirements of the exercises will influence participant performance. Although practitioners will continue to adjust exercises to fit their organizations, a better understanding of the influence of exercise design characteristics should give practitioners needed direction on which aspects of the exercise should and should not be changed. Paying more attention to AC exercise context is also consistent with understanding how context influences organizational behavior (Johns, 2006).

Finally, if the ability to interact socially under stress is an important part of what is being assessed in some AC exercises, practitioners should take this into consideration when determining how relevant the AC exercises are for the position being considered. Similar to the research that has shown that higher CA will negatively influence interview performance (Ayres & Crosby, 1995; McCarthy & Goffin, 2004), ACs that are being used for selection purposes are likely to be considered stressful situations by applicants. Practitioners should be aware of this and consider the extent to which a stressful AC exercise would be related to actual job requirements. For example, it is conceivable that some job candidates with higher CA may not perform as well in a group discussion in an assessment center context, but would perform well within the context of an ongoing team at work. On the other hand, if oral communication skills are related to performance in a position (e.g. manager), then ACs may be uniquely effective for evaluating these skills which other methods (e.g. personality profiles, cognitive ability tests) do not directly evaluate. These other methods may be more efficient at assessing certain individual

characteristics, but assessment center technology may be especially effective in assessing communication skills in social settings.

Future Research

This study suggests several new directions for future research, and three areas seem most in need of research attention. First, future research should examine other interactions between person-centered attributes and exercise characteristics. One especially interesting area would be to look at how cultural values such as collectivism may influence assessment center participant performance across different exercises. Studies could follow a similar format to the one used in this study or examine and report the relationships between individual characteristics across multiple exercises (e.g. Spector et al., 2000). These approaches should continue to increase our understanding of assessment center construct validity.

In addition, House, Shane, & Herold, (1996) suggest that “It is more meaningful to ask how dispositional variables and organizational variables interact in evoking behavior, how behavior plays out, and the conditions under which the main effects are predictable, enhanced, or suppressed. Therefore, it is necessary to conduct studies that simultaneously incorporate organizationally relevant dispositional and situational variables in their design.” As this study demonstrates, the assessment center context provides an opportunity to look at these person-situation interactions in controlled, “real-world” settings.

Second, since it is clear that exercises influence participant behavior, more systematic study of AC exercises is needed to identify important underlying exercise characteristics (Bycio et al., 1987; Schneider and Schmitt, 1992). Taking these steps will

allow researchers to begin to unlock the “black box” of AC exercises and potentially lead to more standardization across exercises. This will also enable more precise prescriptions to be offered to practitioners who have to make decisions on which exercises to include in their assessment centers. Currently, there are few evidence-based recommendations to guide practitioners decisions. This research is needed to give practitioners more precise direction in deciding which exercises to select for an assessment center.

Finally, communication apprehension deserves more attention in future assessment center research. Considering the centrality of communication requirements in many AC exercises, this construct could potentially influence participant performance across all dimensions in exercises requiring oral communication. CA may also help explain criterion-related variance such as job performance that AC scores are able to explain over and above other factors such as cognitive ability and paper and pencil measures.

Conclusion

In conclusion, this study contributes to the AC literature by adding a missing piece to the construct validity puzzle. As we continue to put together the puzzle, the construct confusion will begin to dissipate as a clearer picture of what is being assessed in assessment center exercises emerges.

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FIGURES

Figure 1: Assessment Center Process

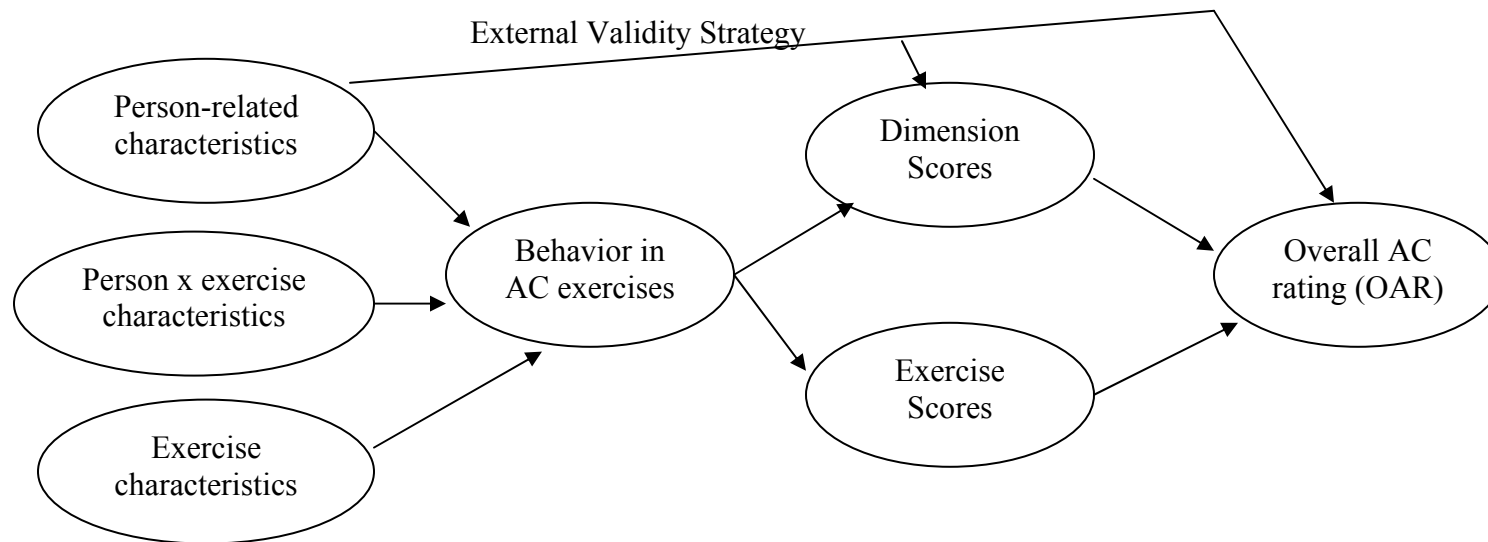


Figure 2: Interactive Effect of Communication Apprehension and Exercise Form on Critical Thinking

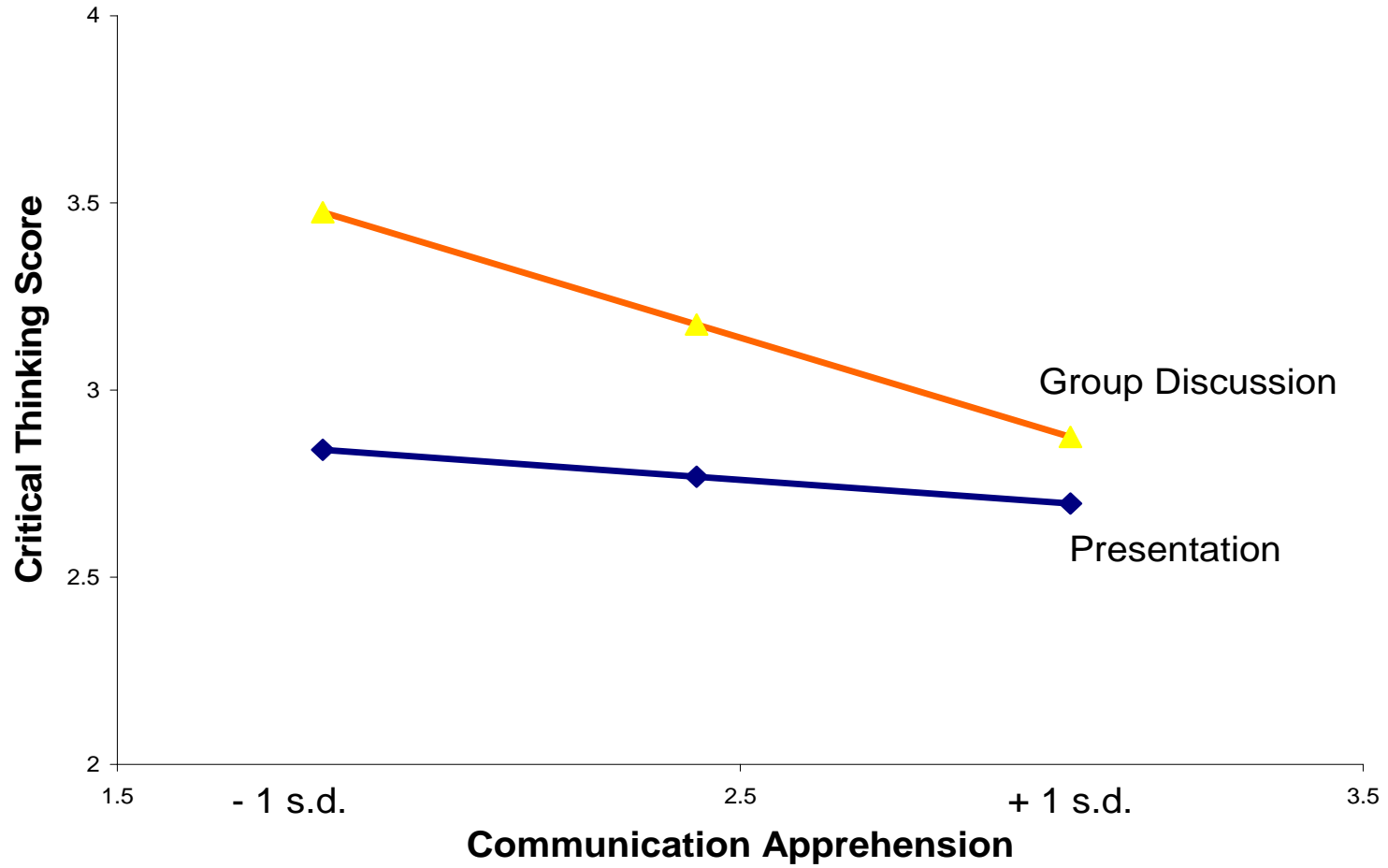
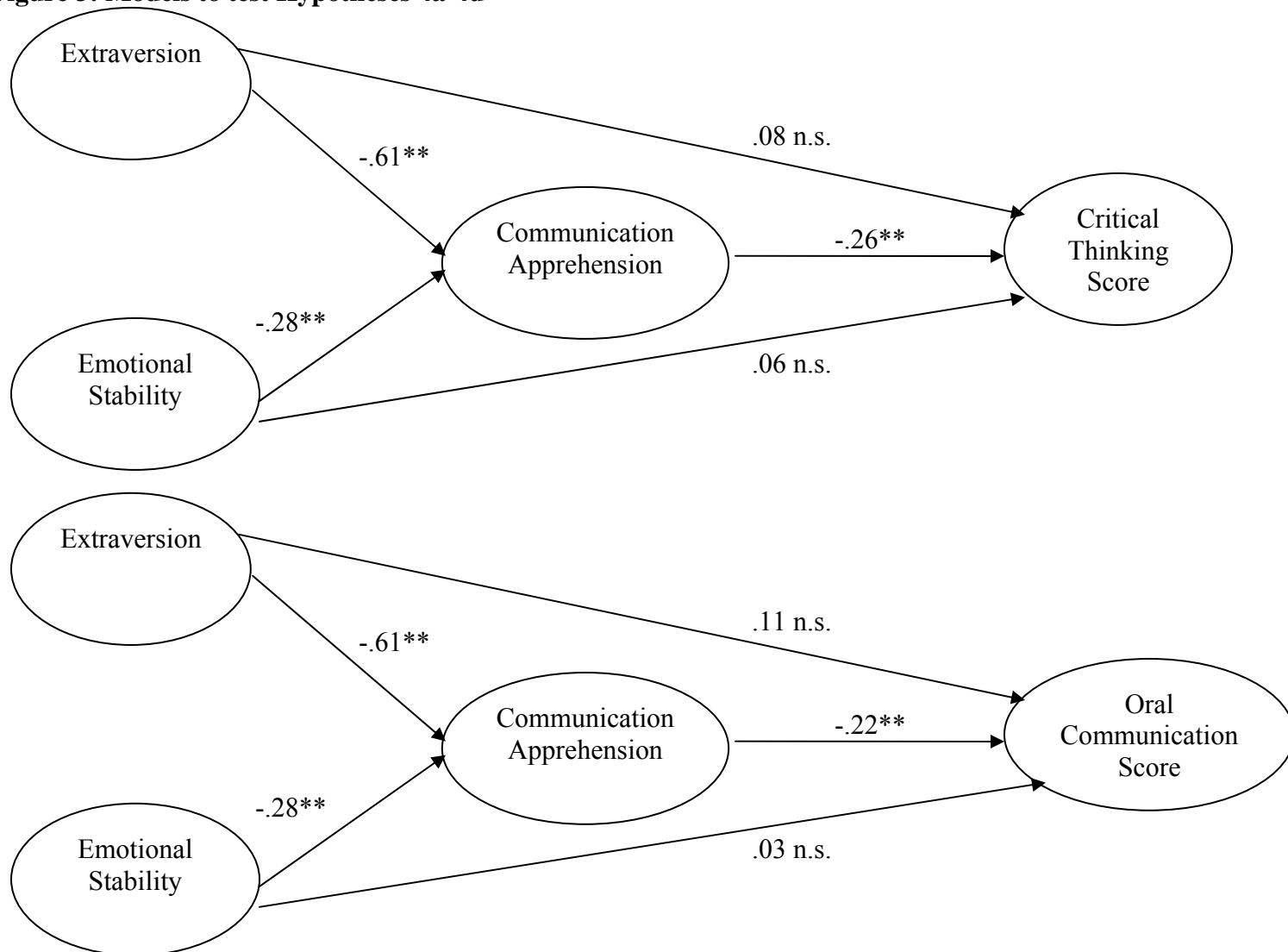


Figure 3: Models to test Hypotheses 4a-4d



n.s.: Not Significant
** p < .01

TABLES

Table 1: Exercises Included in Study

Exercise Content:	Competitive	Non-Competitive
Exercise Form:		
Group Interaction	Competitive Leaderless Group Discussion (LGD)	Non-competitive Leaderless Group Discussion (LGD)
Individual Presentation	Competitive Oral Presentation	Non-competitive Oral Presentation

Table 2: Leaderless Group Discussion Exercise Design Characteristics

LGD Design Dims.

Assigned role:	No	Yes, no explicit personal ownership	Yes, personal ownership taken
Individual goal:	None	Represent position	Convince others of your perspective
Group goal:	Sole focus	Discuss to make best decision	Agree on "winner"
Goal Conflict:	No	Moderate	High
	Least Competitive		Most Competitive

Competitive Nature of LGD

Table 3: Results of Manipulation Checks

	Competitive Manipulation	Non-Competitive Manipulation	t-test
Group Discussion:			
Perceived Competitiveness	3.0	2.4	p < .01
Presentation:			
Perceived Competitiveness	2.8	2.3	p < .01

Stress experienced in:	Group Discussion	Presentation	
Competitive	2.4	3.7	p < .01
Non-Competitive	1.9	3.7	p < .01

Table 4: Means, Standard Deviations, Cronbach's Alphas, and Intercorrelations among Variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1 English as Second Language (ESL)	1.09	.29											
2 General mental ability	26.51	4.68	-.16										
3 Motivation	3.96	.63	-.14	-.13	(.64)								
4 Emotional stability	3.33	.64	-.06	.11	.15	(.85)							
5 Extraversion	3.53	.64	-.06	.01	.20	.21	(.88)						
6 Collectivism	3.74	.42	-.19	-.03	.15	.15	.35	(.72)					
7 Communication Apprehension	2.43	.60	.11	-.05	-.29	-.35	-.56	-.42	(.94)				
8 Exercise Form (LGD=1; Present=0)	.52	.50	.05	.04	-.01	-.02	.06	-.02	-.06				
9 Exercise Content (Competitive=1; Non-Competitive=0)	.50	.50	.01	-.05	-.04	-.07	-.12	-.04	.08	.01			
10 Oral Communication Score	3.01	.91	-.24	.12	.11	.13	.19	.19	-.22	-.02	.07	(.86)	
11 Critical Thinking Score	2.99	.93	-.14	.15	.03	.07	.10	.12	-.24	.23	.03	.50	(.80)

N=282. Cronbach's alphas listed on diagonal in parentheses, where applicable.

If $r = |.12|$, $p < .05$

If $r = |.16|$, $p < .01$

Table 5: Hierarchical Regression Analyses for Oral Communication and Critical Thinking

Model Independent Variables	Oral Communication Score			Critical Thinking Score		
	Model 1a	Model 1b	Model 1c	Model 2a	Model 2b	Model 2c
	β	β	β	β	β	β
Step 1						
English as Second Language	-.21**	-.18**	-.18**	-.11 [†]	-.11 [†]	-.10
Motivation	.09	.04	.05	.04	-.03	-.01
General mental ability (GMA)	.10	.10	.10	.14*	.12*	.13*
Step 2						
Exercise Form		-.02	-.02		.22**	.22**
Exercise Content		.10 [†]	.10 [†]		.06	.06
Collectivism		.09	.15		.03	.09
Communication Apprehension		-.15*	-.12		-.21**	-.08
Step 3						
Collectivism x Exercise Content			-.08			-.10
Communication Apprehension x Exercise Form			-.04			-.19*
R^2 (Adjusted)	.06	.09	.09	.04	.14	.16
ΔR^2		.03**	.00		.10**	.02 [†]
Overall Model F	6.99**	5.09**	4.06**	3.65*	6.25**	5.53**

N=282

[†] $p < .10$

* $p < .05$

** $p < .01$

Table 6: Standardized Factor Loadings for Full Measurement Model

Item	g	ESL	MOT	E	ES	CAG	CAM	CAC	CAS	CT/OC
g	1.00									
ESL		1.00								
MOT1			.62							
MOT2			.64							
MOT3			.60							
E1				.60						
E2				.69						
E3				.64						
E4				.70						
E5				.71						
E6				.70						
E7				.66						
E8				.61						
E9				.57						
E10				.72						
ES1					.60					
ES2					.52					
ES3					.55					
ES4					.45					
ES5					.50					
ES6					.66					
ES7					.66					
ES8					.71					
ES9					.68					
ES10					.64					

Table 6: Continued

Item	g	ESL	MOT	E	ES	CAG	CAM	CAC	CAS	CT/OC
CA1						.57				
CA2						.76				
CA3						.84				
CA4						.72				
CA5						.82				
CA6						.88				
CA7							.81			
CA8							.82			
CA9							.74			
CA10							.74			
CA11							.74			
CA12							.80			
CA13								.68		
CA14								.70		
CA15								.82		
CA16								.88		
CA17								.70		
CA18								.67		
CA19									.76	
CA20									.62	
CA21									.85	
CA22									.66	
CA23									.71	
CA24									.68	
CT/OC										.90/.93

Note. Full text for each item appears in Appendix A

g = Cognitive Ability; ESL = English as a Second Language; MOT=Motivation; E = Extraversion; ES = Emotional Stability; CAG = Communication Apprehension in Groups; CAM = Communication Apprehension in Meetings; CAC = Communication Apprehension in Conversations; CAS = Communication Apprehension in Speeches; CT = Critical Thinking Score; OC = Oral Communication Score

Table 7: Structural Equation Model Fit Statistics

Oral Communication Model	DOF	CHI SQ	CFI	NNFI	RMSEA	SRMR
CFA	1133	2038.8**	.97	.96	.054	.059
Theoretical (T)	1168	2149.3**	.96	.96	.056	.086

** p <.01

Critical Thinking Model	DOF	CHI SQ	CFI	NNFI	RMSEA	SRMR
CFA	1133	2020.0**	.97	.96	.054	.059
THEORETICAL (T)	1168	2132.8**	.96	.96	.055	.086

** p <.01

APPENDICES

Appendix A: Measures Collected about One Month before Iliad

Collectivism (Wagner, 1995)

- I prefer to work with others in a group rather than working alone
- Given the choice, I would rather do a job where I can work alone rather than doing a job where I have to work with others in a group
- Working with a group is better than working alone

- People should be made aware that if they are going to be part of a group then they are sometimes going to have to do things they don't want to do
- People who belong to a group should realize that they're not always going to get what they personally want
- People in a group should realize that they sometimes are going to have to make sacrifices for the sake of the group as a whole
- People in a group should be willing to make sacrifices for the sake of the group's well-being

- A group is more productive when its members do what they want to do rather than what the group wants them to do
- A group is most efficient when its members do what they think is best rather than doing what the group wants them to do
- A group is more productive when its members follow their own interests and concerns

Extraversion (Goldberg, 1999)

- Am the life of the party.
- Don't talk a lot. (R)
- Feel comfortable around people.
- Keep in the background. (R)
- Start conversations.
- Have little to say. (R)
- Talk to a lot of different people at parties
- Don't like to draw attention to myself. (R)
- Don't mind being the center of attention
- Am quiet around strangers. (R)

Emotional Stability (Goldberg, 1999)

- Get stressed out easily. (R)
- Am relaxed most of the time.
- Worry about things. (R)
- Seldom feel blue.
- Am easily disturbed. (R)

- Get upset easily. (R)
- Change my mood a lot. (R)
- Have frequent mood swings. (R)
- Get irritated easily. (R)
- Often feel blue. (R)

Communication Apprehension (McCroskey, 1982)

DIRECTIONS: This instrument is composed of twenty-four statements concerning feelings about communicating with other people. Please indicate the degree to which each statement applies to you. Work quickly; record your first impression.

1. I dislike participating in group discussions.
2. Generally, I am comfortable while participating in group discussions. (R)
3. I am tense and nervous while participating in group discussions.
4. I like to get involved in group discussions. (R)
5. Engaging in a group discussion with new people makes me tense and nervous.
6. I am calm and relaxed while participating in group discussions. (R)
7. Generally, I am nervous when I have to participate in a meeting.
8. Usually I am calm and relaxed while participating in meetings. (R)
9. I am very calm and relaxed when I am called upon to express an opinion at a meeting. (R)
10. I am afraid to express myself at meetings.
11. Communicating at meetings usually makes me uncomfortable.
12. I am very relaxed when answering questions at a meeting. (R)
13. While participating in a conversation with a new acquaintance, I feel very nervous.
14. I have no fear of speaking up in conversations. (R)
15. Ordinarily I am very tense and nervous in conversations.
16. Ordinarily I am very calm and relaxed in conversations. (R)
17. While conversing with a new acquaintance, I feel very relaxed. (R)
18. I'm afraid to speak up in conversations.
19. I have no fear of giving a speech. (R)
20. Certain parts of my body feel very tense and rigid while giving a speech.
21. I feel relaxed while giving a speech. (R)
22. My thoughts become confused and jumbled when I am giving a speech.
23. I face the prospect of giving a speech with confidence. (R)
24. While giving a speech, I get so nervous I forget facts I really know.

I speak English as

- A. My native language (spoken by my family growing up)
- B. A second language

Appendix A: Measures Collected Immediately Prior to Iliad

Please indicate to what extent you agree with these statements using the following scale:

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
A.	B.	C.	D.	E.

Motivation

- I really want to perform well in the Iliad exercises
- I am NOT very motivated to do well in the Iliad exercises
- I am really enthused to demonstrate my skills & abilities in the Iliad exercise

Appendix A: Manipulation Check Measures Collected Immediately after Iliad

Please indicate to what extent you agree with these statements using the following scale:

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
A.	B.	C.	D.	E.

Salary-Increase Allocation Group Meeting:

- Competing with the other group members was an important part of the group meeting.
- In my group meeting, I competed with the other members to gain as large of a salary increase as possible for the employee I was assigned to represent.
- The nature of our group meeting was competitive.

- Participating in the group meeting was stressful.
- I felt tense and nervous during the group meeting.
- I could have performed better in the group meeting if I wouldn't have been so anxious.

Oral Presentation:

- Participating in the speech exercise was stressful.
- I felt tense and nervous during my speech.
- I could have given a better speech if I wouldn't have been so anxious.

- Competing with the other members of the Task Force was an important part of the speech exercise.
- In my speech, I competed with the other members to gain as much of the expansion money as possible for my market.
- The nature of our speech exercise was competitive.

Appendix B: Competitive LGD Exercise

Iliad, Inc. Interoffice Memo

From: Minnie Walker *MW*

Re: Compensation Committee Meeting

For this exercise, you are to assume the role of a member of Iliad's compensation committee. You will have **8 minutes** to review this information and take notes before the meeting begins. You should not talk to the other committee members until the meeting begins. Your committee will then have **17 minutes** for the exercise.

All Iliad employees receive regular merit increases annually, but your committee has been given **\$6,000 of salary-increase funds** to distribute to employees of Iliad if special circumstances arise throughout the year. Today, your committee will review the cases of 5 of these employees.

One of these employees, **Linda Miller, is from your department and has been assigned to you to "champion" for a salary increase.** You are the **only one on the committee** that has received a memo (see attached) from Linda's supervisor with additional information for why Linda Miller deserves a salary increase. **Your goal is to effectively promote Linda Miller's case so that she receives as large of a salary increase as possible. That is, you want Linda to get a big salary increase.**

In addition, please refer to the attached Summary Table that has been distributed to all committee members to help prepare everyone for the meeting. Each of the committee members will have additional information about one of the employees listed on the Summary Table.

The committee should come to agreement on the recommended salary increases, which should be recorded on the bottom of the Summary Table that you have received. One copy should be signed by all members at the end of the meeting. As always, your input in this meeting is appreciated.

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One of these employees, **Linda Miller, is from your department and has been assigned to you to "champion" for a salary increase.** You are the **only one on the committee** that has received a memo (see attached) from Linda's supervisor with additional information for why Linda Miller deserves a salary increase. **Your goal is to effectively promote Linda Miller's case so that she receives as large of a salary increase as possible. That is, you want Linda to get a big salary increase.**

In addition, please refer to the attached Summary Table that has been distributed to all committee members to help prepare everyone for the meeting. Each of the committee members will have additional information about one of the employees listed on the Summary Table.

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One of these employees, **David Smith, is from your department and has been assigned to you to "champion" for a salary increase.** You are the **only one on the committee** that has received a memo (see attached) from David's supervisor with additional information for why David Smith deserves a salary increase. **Your goal is to effectively promote David Smith's case so that he receives as large of a salary increase as possible. That is, you want David to get a big salary increase.**

In addition, please refer to the attached Summary Table that has been distributed to all committee members to help prepare everyone for the meeting. Each of the committee members will have additional information about one of the employees listed on the Summary Table.

The committee should come to agreement on the recommended salary increases, which should be recorded on the bottom of the Summary Table that you have received. One copy should be signed by all members at the end of the meeting and be put in the box at the back of the Main Office. As always, your input in this meeting is appreciated.

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One of these employees, **Sara Johnson**, is from your department and has been assigned to you to **"champion" for a salary increase**. You are the **only one on the committee** that has received a memo (see attached) from Sara's supervisor with additional information for why Sara Johnson deserves a salary increase. **Your goal is to effectively promote Sara Johnson's case so that she receives as large of a salary increase as possible. That is, you want Sara to get a big salary increase.**

In addition, please refer to the attached Summary Table that has been distributed to all committee members to help prepare everyone for the meeting. Each of the committee members will have additional information about one of the employees listed on the Summary Table.

The committee should come to agreement on the recommended salary increases, which should be recorded on the bottom of the Summary Table that you have received. One copy should be signed by all members at the end of the meeting and be put in the box at the back of the Main Office. As always, your input in this meeting is appreciated.

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All Iliad employees receive regular merit increases annually, but your committee has been given **\$6,000 of salary-increase funds** to distribute to employees of Iliad if special circumstances arise throughout the year. Today, your committee will review the cases of 5 of these employees.

One of these employees, **Pete Williams, is from your department and has been assigned to you to "champion" for a salary increase.** You are the **only one on the committee** that has received a memo (see attached) from Pete's supervisor with additional information for why Pete Williams deserves a salary increase. **Your goal is to effectively promote Pete Williams' case so that he receives as large of a salary increase as possible. That is, you want Pete to get a big salary increase.**

In addition, please refer to the attached Summary Table that has been distributed to all committee members to help prepare everyone for the meeting. Each of the committee members will have additional information about one of the employees listed on the Summary Table.

The committee should come to agreement on the recommended salary increases, which should be recorded on the bottom of the Summary Table that you have received. One copy should be signed by all members at the end of the meeting and be put in the box at the back of the Main Office. As always, your input in this meeting is appreciated.

Iliad, Inc. Interoffice Memo

From: Minnie Walker *MW*

Re: Compensation Committee Meeting

For this exercise, you are to assume the role of a member of Iliad's compensation committee. You will have **8 minutes** to review this information and take notes before the meeting begins. You should not talk to the other committee members until the meeting begins. Your committee will then have **17 minutes** for the exercise.

All Iliad employees receive regular merit increases annually, but your committee has been given **\$6,000 of salary-increase funds** to distribute to employees of Iliad if special circumstances arise throughout the year. Today, your committee will review the cases of 5 of these employees.

One of these employees, **Bill Jones, is from your department and has been assigned to you to "champion" for a salary increase.** You are the **only one on the committee** that has received a memo (see attached) from Bill's supervisor with additional information for why Bill Jones deserves a salary increase. **Your goal is to effectively promote Bill Jones' case so that he receives as large of a salary increase as possible. That is, you want Bill to get a big salary increase.**

In addition, please refer to the attached Summary Table that has been distributed to all committee members to help prepare everyone for the meeting. Each of the committee members will have additional information about one of the employees listed on the Summary Table.

The committee should come to agreement on the recommended salary increases, which should be recorded on the bottom of the Summary Table that you have received. One copy should be signed by all members at the end of the meeting and be put in the box at the back of the Main Office. As always, your input in this meeting is appreciated.

Summary Table of Iliad Employees Being Considered for a Special Salary Increase

Employee	Linda Miller	David Smith	Sara Johnson	Pete Williams	Bill Jones
Title	Computer Programmer	Contract Administrator	Research Analyst	Sr. Industrial Engineer	Security Manager
Degree(s)	BS	BS	BS, MS	BSIE	BA
Relevant experience in position	3 years	3.5 years	2 years	4 years	17 years
Tenure with Iliad	1 year	2 years	5 years	4 years	16 years
Starting Salary	\$48,000	\$55,000	\$50,000	\$45,000	\$25,000
Supervisor Performance Rating (4/01/05)	4.7/5.0	4.7/5.0	5.0/5.0	4.7/5.0	5.0/5.0
Annual salary merit increase (4/01/05)	\$1,500	\$3,000	\$4,000	\$2,500	\$1500
Current Salary	\$49,500	\$60,000	\$62,000	\$52,000	\$45,000
Iliad Salary Comparison¹	low	above average	average	low	low
Average Industry Salary Benchmark²	\$58,000	\$52,000	\$55,000	\$60,000	\$54,000

1. Relation of salary to other Iliad employees with similar job responsibilities
2. Average salary of employees of other companies with similar job responsibilities

Employee	Amount of Salary Increase
Linda Miller	
David Smith	
Sara Johnson	
Pete Williams	
Bill Jones	
Total	

Signatures of Meeting Participants	Iliad Number
1.	
2.	
3.	
4.	
5.	

Appendix B: Non-competitive LGD Exercise

Iliad, Inc. Interoffice Memo

From: Minnie Walker *MW*

Re: Compensation Committee Meeting

For this exercise, you are to assume the role of a member of Iliad's compensation committee. You will have **8 minutes** to review this information and take notes before the meeting begins. You should not talk to the other committee members until the meeting begins. Your committee will then have **17 minutes** for the exercise.

All Iliad employees receive regular merit increases annually, but your committee has been given **\$6,000 of salary-increase funds** to distribute to employees of Iliad if special circumstances arise throughout the year. Today, your committee will review the cases of 5 of these employees.

You have just received a memo (see attached) from the supervisor of **Linda Miller**, who is one of the employees being considered for a salary increase. You may want to inform the group of this information regarding Linda Miller since you are the only one on the committee that has received this memo. **Your goal is not necessarily to be an advocate for Linda, but to work together with the other members to consider Iliad's overall interests. That is, as a committee decide how to best allocate the salary-increase funds based on each employee's value to Iliad.**

In addition, please refer to the attached Summary Table that has been distributed to all committee members to help prepare everyone for the meeting. Each of the committee members will have additional information about one of the employees listed on the Summary Table.

The committee should come to agreement on the recommended salary increases, which should be recorded on the bottom of the Summary Table that you have received. One copy should be signed by all members at the end of the meeting. As always, your input in this meeting is appreciated.

Iliad, Inc. Interoffice Memo

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All Iliad employees receive regular merit increases annually, but your committee has been given **\$6,000 of salary-increase funds** to distribute to employees of Iliad if special circumstances arise throughout the year. Today, your committee will review the cases of 5 of these employees.

You have just received a memo (see attached) from the supervisor of **David Smith**, who is one of the employees being considered for a salary increase. You may want to inform the group of this information regarding David Smith since you are the only one on the committee that has received this memo. **Your goal is not necessarily to be an advocate for David, but to work together with the other members to consider Iliad's overall interests. That is, as a committee decide how to best allocate the salary-increase funds based on each employee's value to Iliad.**

In addition, please refer to the attached Summary Table that has been distributed to all committee members to help prepare everyone for the meeting. Each of the committee members will have additional information about one of the employees listed on the Summary Table.

The committee should come to agreement on the recommended salary increases, which should be recorded on the bottom of the Summary Table that you have received. One copy should be signed by all members at the end of the meeting and be put in the box at the back of the Main Office. As always, your input in this meeting is appreciated.

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All Iliad employees receive regular merit increases annually, but your committee has been given **\$6,000 of salary-increase funds** to distribute to employees of Iliad if special circumstances arise throughout the year. Today, your committee will review the cases of 5 of these employees.

You have just received a memo (see attached) from the supervisor of **Sara Johnson**, who is one of the employees being considered for a salary increase. You may want to inform the group of this information regarding Sara Johnson since you are the only one on the committee that has received this memo. **Your goal is not necessarily to be an advocate for Sara, but to work together with the other members to consider Iliad's overall interests. That is, as a committee decide how to best allocate the salary-increase funds based on each employee's value to Iliad.**

In addition, please refer to the attached Summary Table that has been distributed to all committee members to help prepare everyone for the meeting. Each of the committee members will have additional information about one of the employees listed on the Summary Table.

The committee should come to agreement on the recommended salary increases, which should be recorded on the bottom of the Summary Table that you have received. One copy should be signed by all members at the end of the meeting and be put in the box at the back of the Main Office. As always, your input in this meeting is appreciated.

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Current Salary	\$49,500	\$60,000	\$62,000	\$52,000	\$45,000
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1. Relation of salary to other Iliad employees with similar job responsibilities
2. Average salary of employees of other companies with similar job responsibilities

Employee	Amount of Salary Increase
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David Smith	
Sara Johnson	
Pete Williams	
Bill Jones	
Total	

Signatures of Meeting Participants	Iliad Number
1.	
2.	
3.	
4.	
5.	

Appendix C: Competitive Oral Presentation Exercise

Iliad, Inc. Interoffice Memo

Date: << >>

To: <<Student Name>>, VP of ___

From: Anton Bartels, International Expansion (IE) Task Force Coordinator

Re: Presentation on Expansion into <<Market>>

As you may know, Iliad has decided to expand our market presence internationally, and has designated \$10 million for its international expansion (IE). We are considering expanding into the South American, West European, Scandinavian, Asian, and Pacific Rim markets.

Iliad would like to get the advice of the VP's on the IE Task Force before determining how much to invest in each market. On **<date and time>** you are scheduled to make a **3 minute** presentation to the other VPs on the IE Task Force in **<Room>**.

You have been assigned by the President to represent the **<market>**. In your presentation, **you should make a recommendation for how much of the \$10 million** you think should be allocated to your market. **Your goal is to effectively promote and gain investment dollars for your market. That is, you want to get as much money as possible for your market.**

Your presentation should include (1) an introduction, (2) main points (including the strengths and weaknesses of your market) that are supported by evidence, (3) your recommendation regarding the market, and (4) a summary and closing.

In the same time block that you are scheduled, several other VPs will also be presenting on the other markets. Everyone must stay for all of the task force presentations. Of the VPs, you have been picked to speak **<<first-fifth>>**. After everyone has presented, you will record your personal recommendation for how you believe the money should be allocated between the five markets based on the presentations.

Please put your recommendation (this page) in the box at the back of the Main Office when you return there. The president will use your recommendation to make a final decision. Thank you for your input.

Market	Allocation
South American	
West European	
Scandinavian	
Asian	
Pacific Rim	
Total	\$10 Million

Appendix C: Non-Competitive Oral Presentation Exercise

Iliad, Inc. Interoffice Memo

Date: << >>

To: <<Student Name>>, VP of ___

From: Anton Bartels, International Expansion (IE) Task Force Coordinator

Re: Presentation on Expansion into <<Market>>

As you may know, Iliad has decided to expand our market presence internationally, and has designated \$10 million for its international expansion (IE). We are considering expanding into the South American, West European, Scandinavian, Asian, and Pacific Rim markets.

Iliad would like to get the advice of the VP's on the IE Task Force before determining how much to invest in each market. On <**date and time**> you are scheduled to make a **3 minute** presentation to the other VPs on the IE Task Force in <**Room**>.

You have been assigned by the President to present on the <**market**>. In your presentation **you should make a recommendation for how much of the \$10 million** you think should be allocated to the market. **Your goal is not necessarily to be an advocate for your market, but to consider Iliad's overall interests. That is, accurately present your market so your IE Task Force can best allocate the money to maximize the return on Iliad's IE investment.**

Your presentation should include (1) an introduction, (2) main points (including the strengths and weaknesses of your market) that are supported by evidence, (3) your recommendation regarding the market, and (4) a summary and closing.

In the same time block that you are scheduled, several other VPs will also be presenting on the other markets. Everyone must stay for all of the task force presentations. Of the VPs, you have been picked to speak <<**first-fifth**>>. After everyone has presented, please record your personal recommendation below for how you believe the money should be allocated between the five markets based on the presentations. Please put your recommendation (this page) in the box at the back of the Main Office when you return there. The president will use your recommendation to make a final decision. Thank you for being part of this process.

Market	Allocation
South American	
West European	
Scandinavian	
Asian	
Pacific Rim	
Total	\$10 Million

Appendix D: Behavioral Anchors

Examples of High, Typical, and Low Oral Communication Behaviors to Guide Raters
(for both the presentation and LGD exercises):

High

- Good articulation and volume. No notable grammatical errors
- Uses voice inflection to demonstrate emphasis and enthusiasm
- Almost continuous eye contact; only occasionally glances at notes
- Fluid, natural delivery. Does not hesitate or use language fillers (e.g. ahs, ums)
- Appropriate non-verbal behaviors are observed.

Typical

- Adequate articulation and volume. Makes a couple grammatical errors.
- Speaks in monotone much of the time but occasionally demonstrates emphasis or enthusiasm.
- Reads off notes but also makes eye contact throughout
- Hesitates a couple times and uses some language fillers (e.g. ahs, ums)
- A couple inappropriate non-verbal behaviors are observed (e.g. leaning on table, fidgeting, jingling change, playing with hair).

Low

- Can not hear all the words due to mumbling or speaking too softly. Makes multiple grammatical errors
- Speaks in monotone and shows little enthusiasm
- Very little eye contact; reading off notes
- Consistently hesitant (e.g. long pauses, incomplete thoughts) and uses language fillers (e.g. ahs, ums)
- Multiple inappropriate non-verbal behaviors observed (e.g. leaning on table, fidgeting, jingling change, playing with hair).

Examples of High, Typical, and Low Critical Thinking Behaviors to Guide Raters
(in the presentation exercise):

High:

- Identifies multiple decision criteria (e.g. 3-5) using multiple information sources (e.g. SPIO Report and Market Potential Indicators); identifies key underlying issues (e.g. market growth and market size)
- Integrates relevant information from other markets into comments; Integrates multiple strengths and weakness of the assigned market into recommendations
- Gives several logical reasons to support recommendations for assigned market and considers multiple potential consequences of recommendations
- Concluding statements logically follow from points made in the presentation and effectively summarize the main points
- All comments are supported by or consistent with information from case

Typical

- Identifies a single decision criterion using multiple information sources (e.g. SPIO Report or Market Potential Indicators); identifies a key underlying issue (e.g. market growth or market size)
- Integrates some of the relevant information from other markets into comments; Integrates multiple strengths and/or weakness of the assigned market into recommendations
- Gives one or two logical reason to support recommendations for assigned market and considers one potential consequence of recommendations
- Brief concluding statement logically follows from points made in the presentation
- Makes an unrealistic comment or skews information from case

Low

- Doesn't identify decision criteria or use multiple information sources (e.g. SPIO Report or Market Potential Indicators); does not identify key underlying issues (e.g. market growth and market size)
- Does not integrate relevant information from other markets into comments; Only integrates one or two strengths and weakness of the assigned market into recommendations
- Does not provide logic to support recommendations for assigned market (i.e. gives opinions without supporting logic) or consider potential consequences of recommendations
- Does not make concluding statements or logic behind the concluding statements is flawed
- Makes unrealistic comments and skews information from case

Examples of High, Typical, and Low Critical Thinking Behaviors to Guide Raters (in the LGD):

High:

- Identifies multiple decision criteria or key underlying issues using multiple information sources (e.g. Memos and Summary Table)
- Integrates relevant information about their employee into comments; Integrates information from others into recommendations
- Gives several (e.g. 4 or more) logical reasons and potential consequences in recommendations of why certain employees should receive higher salary increases than others
- Concluding statements logically follow from points made in the discussion
- All comments are supported by or consistent with information from case

Typical

- Identifies a decision criteria or key underlying issue using information sources (e.g. Memos and Summary Table)

- Integrates some of the relevant information about their employee into comments; Occasionally integrates information from others into recommendations
- Gives a few (e.g. 2-3) logical reasons and potential consequences for recommendations of why certain employees should receive higher salary increases than others
- Logic behind concluding statements is not clear
- Makes an unrealistic comment or skews information from case

Low

- Doesn't identify decision criteria or key underlying issues using information sources (e.g. Memos and Summary Table)
- Does not integrate relevant information about their employee or leaves out important information when making comments; Does not integrate information from others into recommendations
- Does not provide logical reasons and potential consequences for recommendations of why certain employees should receive higher salary increases than others. May give opinions without supporting logic
- Logic behind concluding statements is flawed
- Makes unrealistic comments and skews information from case

VITA

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BORN: Lafayette, IN
DEGREES: B.S. Purdue University, 1998
M.B.A. Bradley University, 2001
Ph.D. Indiana University, 2006

CONFERENCE PRESENTATIONS AND PROCEEDINGS

Blume, B. D., Baldwin, T. T., Rubin, R. S., & Bommer, W. (2006). All Forced Ranking Systems Are Not Created Equal: A Policy Capturing Study. *Best Paper Proceedings, Academy of Management Conference, Atlanta, GA.*

Blume, B. D., Baldwin, T. T., & Rubin, R. S. (2005). Forced Ranking: What it is and who is Attracted to it? An Empirical Study of Performance Management System Preferences among the Next Generation Workforce. *Academy of Management Conference, Honolulu, HI.*

Blume, B. D., & Covin, J. G. (2005). Exploring Entrepreneurs' Attributions to Intuition as a Basis for the Venture Founding Decision. *Academy of Management Conference, Honolulu, HI.*

PROFESSIONAL AFFILIATIONS

Academy of Management
American Psychological Association
Society for Human Resource Management
Society of Industrial and Organizational Psychology